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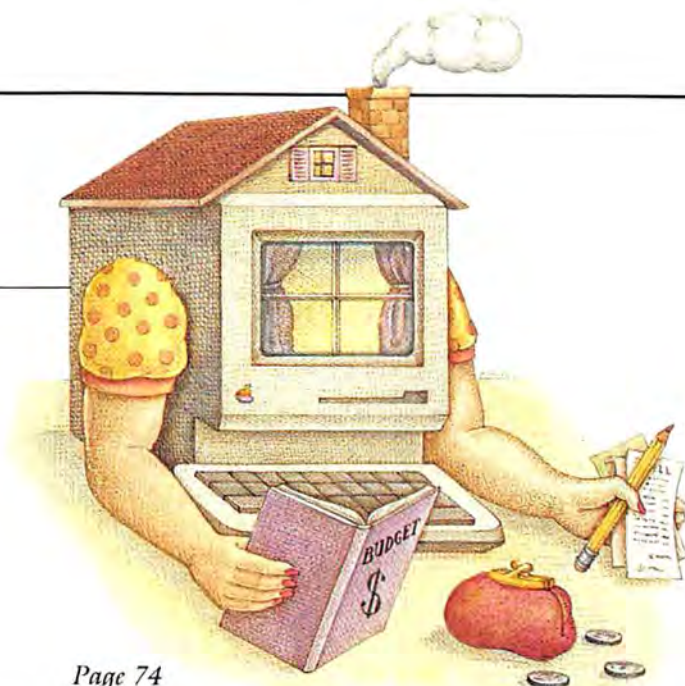


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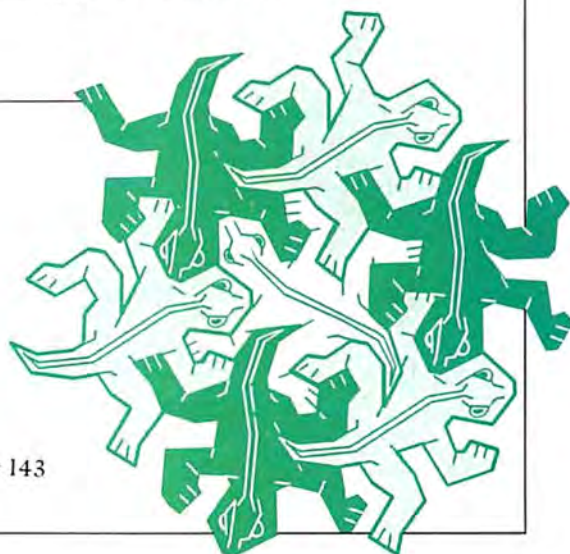
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SHAZAM™ isn't a Captain American video game or an exclamation from Gomer Pyle. Here it's a "self-installing", extremely fast, and compact replacement for the Finder when you wish to select an application to run.

This program even lets you remove the Finder from your disk, saving valuable space. You can always run Finder from an other disk. Or, you can run Finder as an application using **SHAZAM**.

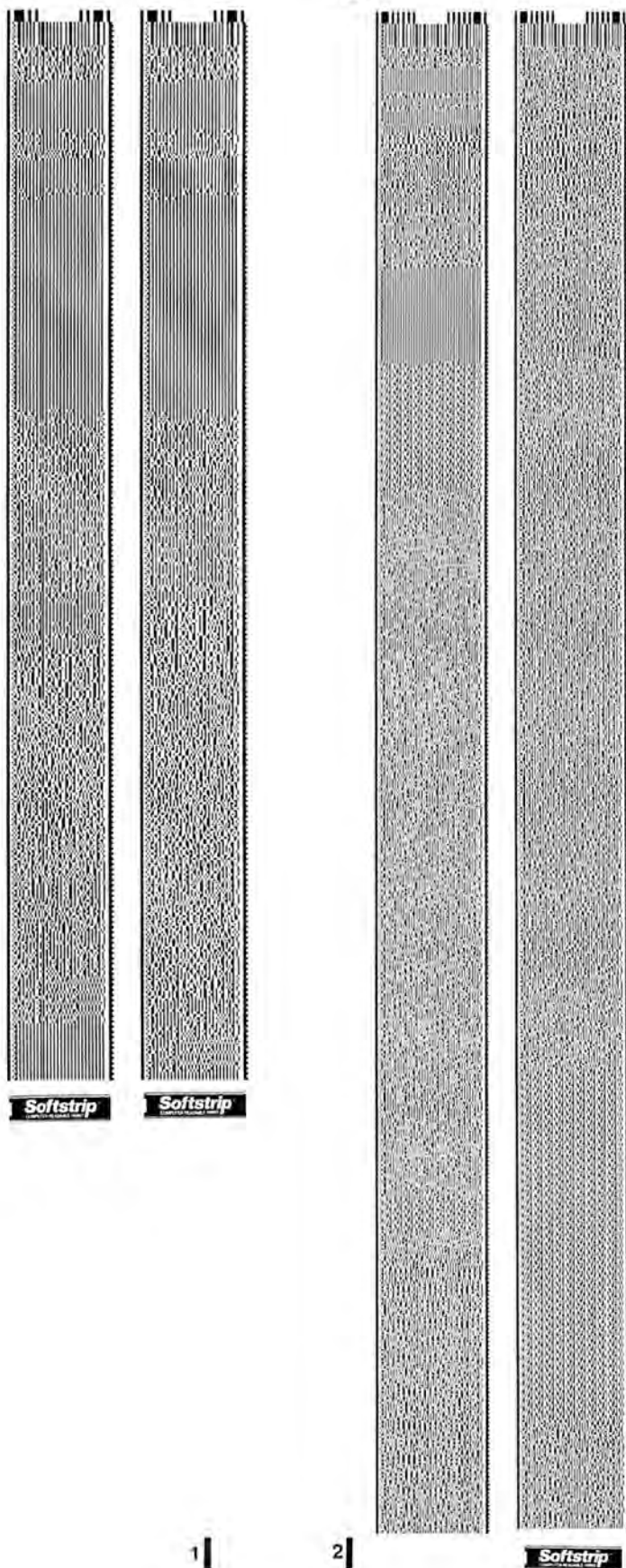
Read in the strip of the program you're interested in. **BROWSE** is the first strip on the right, and **SHAZAM** is the next one over. Double click the appropriate icon to execute the program. Use it the same way you'd use your Finder.

Both of these programs are part of the **MUSICWORKS UTILITIES**, which are a collection of small, but very useful, programs written by Bob Rees.

CUSTOMIZE YOUR BUSINESS HEADINGS

The two data strips on the far right contain a program called **HEADINGS**, which is part of the Mac Art for Business program collection by Patricia Frank. With it you can add flair to your business stationery, memos, reports, and business forms. It helps you design headings that add a graphic touch to those printed papers you have to create during the day.

Read in the strips. Load it into MacPaint or use it with any Macintosh word processor. From the Finder, double click on the **HEADINGS** icon. If MacPaint is also available, the file will be opened. From within MacPaint, choose Open from the File menu, click on **HEADINGS**, and click the Open button.



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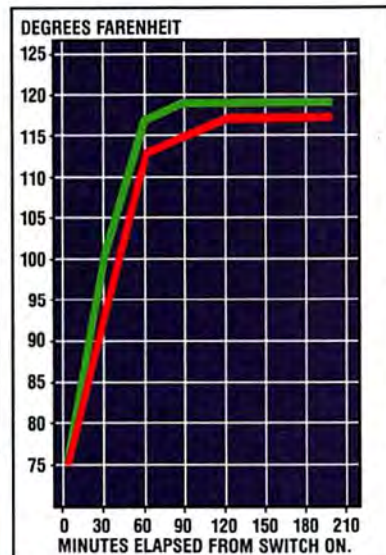
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COMET LASERWRITER

by Neil L. Shapiro

I was lying in bed drinking *Rumple Mintz* peppermint schnapps and watching MTV's New Year's Eve Party (magazine editors really know how to have a good time). The announcer said something similar to, "Goodbye to 1985—the year of Halley's Comet, which you need a big, fat telescope to see and even then it doesn't look like much."

Well, I had to disagree. I had just come in from a cold night's observing of Halley's through my own big, fat telescope (a Celestron Super C8 Plus bought in a weak moment) and I had spent well over an hour simply staring at Halley's. Sure it was tiny, blurry and hardly as spectacular as the fireworks in New York's seaport festivities or in the DiViny's rendition of "Pleasure and Pain." But it sure was awe-inspiring to anyone that could understand what was happening.

That train of thought, naturally enough, led me to think about Apple's LaserWriter. In some ways the LaserWriter was the Halley's Comet of computing in 1985. A lot of fanfare followed by product introduction, and the product seemed somehow fuzzy, unfocused and perhaps overshadowed by other events. But still, there was the glow of history about it.

GUTENBERG, FRANKLIN, JOBS?

I'm a believer in the theory that communications shapes history; that many of a society's most all-encompassing features are directly influenced, developed from and changed by that society's abilities to have its people be in touch with one another. It's a theory that's hard to disagree with.

When Gutenberg brought movable type to European societies he started a whole new form of publishing. Books no longer were the realm of an extremely privileged few. Rather, they became more widely available even if still to an aristocracy of nobility and clergy. But it wasn't long before publishers such as Caxton realized that they could publish in a vernacular language and reach a potentially huge audience with works such as Malory's *Morte D'Arthur*. (Caxton was, unfortunately, also the world's first blue-penciling editor as any comparison of Caxton's *Malory* with the original

manuscript discovered by Prof. Vinaver will reveal.)

Gradually the audience for such works grew and grew as more and more people learned to read. The process of books being available led to more people wanting to pick up on reading and, as more people learned to read, there were more books published. Such a process would someday (particularly in parts of a latter-day Cambridge) be referred to as positive feedback.

Finally, so many people had stumbled into learning how to read that Benjamin Franklin and others were, in the 1700's, able to begin toppling a huge, world-wide empire by disseminating their own



views and political arguments through the media of the "broadside." These broadsides were pamphlets printed on private presses expressing everything from homilies to outright sedition against the King. This first example of a free press established the fact that the pen may or may not be mightier than the sword, but used properly it can cause any number of swords to be unsheathed.

Since Franklin's time the free press has progressed in the Western world to truly astounding proportion and power. Indeed, it is sometimes hard to tell the difference between some huge, national newspapers and the political conglomerates they report on.

Streaking into this already star-studded firmament has come the LaserWriter. Well, at least inching and edging its way.

THE NEW RENAISSANCE

How many people you know can read? How many people you know can compute? Most importantly, how many readers do you know *could* compute if given access to a Macintosh?

We are seeing something happen here which can only be compared to the

manner in which reading gave rise to the wealth of new ideas, techniques and sciences that we refer to as the Renaissance. Just as more and more people who were not clergy or high nobility learned to read then, today's new literati are the people who are learning to compute without having to be computer scientists.

Up until now we have only seen what computers can do if applied to a task by a member of the computing aristocracy.

With the advent of the Macintosh we had the first computer capable of being used by the butcher, the baker, the bookie and the outside agitator. With the advent of the LaserWriter we are about to see how such people will be able to put their own thoughts, feelings, ideas and broadsides into print.

Sure, the realm of desktop publishing is now a corporate one. Programs like *PageMaker* and *ReadySetGo* are being sold to the people who can now afford the LaserWriter necessary to really make these programs sing.

Even as we read these words, somewhere a gigantic, boring 200-page, Mac-produced report on widgets and sales curves is being plunked onto an oak desk by a happy corporate gnome who has managed to disguise a lack of creativity with fancy graphics and enhanced type styles. But the advent of the LaserWriter, in the long run, will mean much more than that.

Because sooner or later a laser printer like the LaserWriter will not cost as much as a small car.

What will happen when you can buy a laser printer for less than four hundred dollars? I think it will revolutionize many aspects of the world we live in. Perhaps even literally.

PTA'S AND GUERRILLAS

I've already had a few mailings from a local PTA published via Mac by using laser-produced output on a cheap facsimile-type machine. The results were pretty good. From a printing standpoint, it was at least as eye-catching as "Poor Richard's Almanac." Of course, content-wise, it was pretty awful.

But there was a fellow who, with almost no budget on a borrowed laser printer, was able to produce a very professional looking journal. It was a harbinger of things to come.

I don't really know what political group will be the first to catch onto the possibilities of recreating the broadside. But the technology is there, it's just the price point that is still off. Let's see what might happen when prices go down.

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ment. Print out a hundred or so on a cheap laser printer. Then modem the document across town to another cell member with a laser printer who does likewise and the pyramid builds and builds and grows into a truly massive distribution. Talk about grassroots campaigns.

I'm really curious to see what will happen in countries where freedom of the press is something unfashionable enough to get the publisher called a perpetrator. The spread of computers and computer-processed information will be, in many countries, a form of wildfire. What may ignite the flames will be the ability to share this information quickly, easily and presentably with the masses who still will not have access to a computer, and that's where the new form of printing can come in.

A laser printer is a form of press. It is typography, makeready, production and printout all rolled into one big ball. Of course, the present laser printers are quite slow in regard to other forms of presses. However, you can have thousands of times more people able to use a laser printer and computer combination than could ever learn how to pack type with wooden furniture in a platen press.

Like a comet, the laser printer is a phenomenon. Unlike a comet, once here it remains with us and its effects will continue to grow. Let's just hope that it will not always take a big, fat wallet to appreciate it.

SMALLER GUNS

Meanwhile, there's another revolution that isn't doing so well. That's shareware.

Shareware is software that is offered by its author on a sort of trial basis. The idea is that if the user likes the software then he or she will mail a check to the author.

Some people, like Scott Watson who wrote *Red Ryder*, seem to do pretty well at this. Other authors are not as fortunate.

Part of the problem seems to be that a lot of shareware programs are being picked up by user groups and placed on disks of "public-domain" software and sold. Many shareware authors have publicly said that they feel people are not sending in their shareware fees because the users feel they have already paid for the disk.

Please keep in mind that a shareware author deserves payment. And, if you are using shareware software, you owe that author his or her due. Send it today. It's the only way to keep this particular revolution alive. ☞

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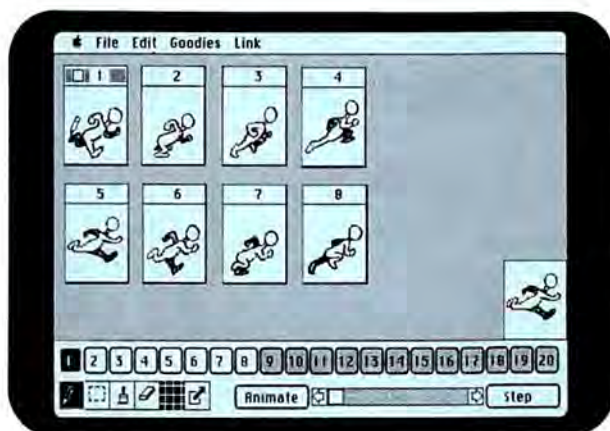


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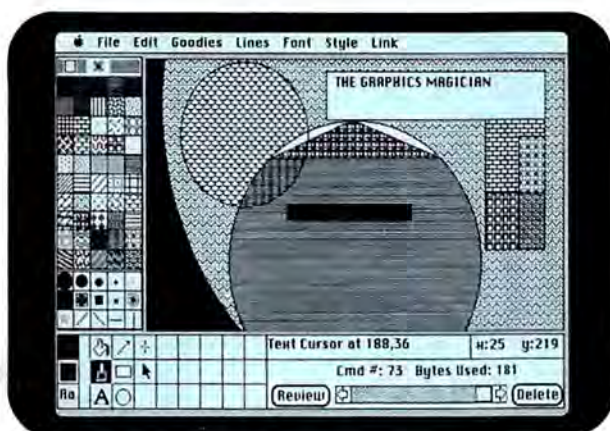
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PC WEEK, Nov. 12, 1985

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J.R. CPA
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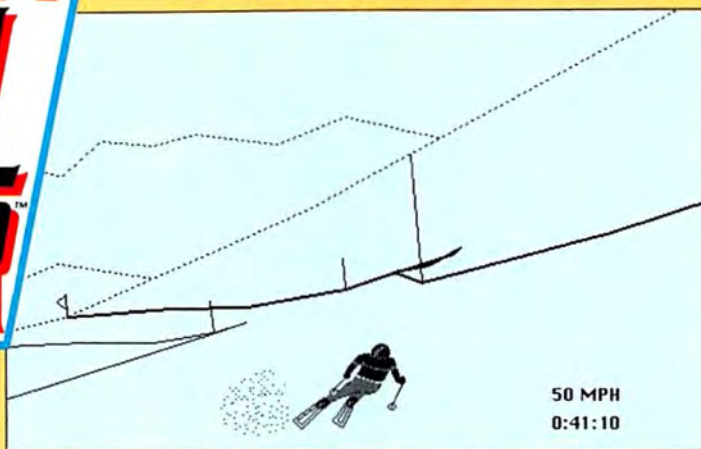
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WHAT'S IN THE COST?

John Dvorak (*MacUser*, January) asserts that much of the LaserWriter's initial price was based on the cost of memory. Since it isn't stated as to how this conclusion is drawn, I assume that he is comparing the price of the LaserWriter with another laser printer that uses the Canon engine but has less memory—notably, the HP LaserJet.

If this is the method used, Mr. Dvorak ignores an important variable. Ordinary laser printers receive data the same way a letter quality printer would, as a stream of ASCII characters. The LaserWriter receives instructions in the PostScript graphics language. Since Apple Computer doesn't own PostScript, and thus must license it from its creators, Adobe Systems, the cost of the license must be built into the price of the LaserWriter. The exact cost is difficult to estimate, since the license agreement has never been disclosed. You can be sure, though, it doesn't come cheap.

Joel S. Peskoff
Forest Hills, NY

NARROWING THE CHOICES

I've had a Macintosh for about 18 months, and have had great fun learning how to use a broad variety of software applications. But until this fall, I really didn't need a spreadsheet, which gave me considerable time to evaluate what the market has to offer.

After reviewing every available spreadsheet, I narrowed the choice down to *Crunch* or *Excel*. Looking at *Jazz*, I concluded that the Lotus product was better left for musicians.

In evaluating *Crunch* or *Excel*, I was riding on a pendulum between ease of use and power. *Crunch* offers some really neat features, but *Excel* offers macros. And the bottom line is productivity. Macros make spreadsheet work more proficient, so I rationalized on buying *Excel*.

Gregory M. Mather
The University of Texas
Austin, TX

CREATIVELY MAC

I am a graphic designer and illustrator in the Twin Cities, Minnesota, who has found the Macintosh to be a valuable creative and business tool. Although I still rely on the conventional tools for illustration, Macintosh has definite potential for providing illustrative needs—although they need to refine the resolution a bit first.

Tim Nyberg
Roseville, MN

GAMING 10, SPREADSHEETS 0

Such a relief to see a magazine that answered questions "we the people," not "us the office" wanted answered. Sorry, Lotus, I've never used a spreadsheet in my life and don't care to, but I can sure get into fiddling with a role-playing fantasy game.

Helen Phillips
Detroit, MI

**BACK TO BASICS**

I enjoyed reading the "Great Language Face-off" (January). However, there is an error in the table comparing the features of the various languages. Although the table indicates that *MS BASIC* is not capable of calling assembly language programs, *MS BASIC* contains a very flexible and easy-to-use method of doing this. Libraries of assembly language programs actually extend the language since statements in libraries can be used just like other BASIC statements. I consider this feature of *MS BASIC* to be one of its greatest strengths, making it a suitable language for the development of serious programs. Already Clear Lake Research (with which I am associated), GW Instruments, First Byte, and Rocinante sell libraries for BASIC. No doubt the number of libraries of BASIC will continue to increase.

David M. Lane
Houston, TX

You'll probably agree with Sharon Zarretto Aker's review of the CLR Libraries in an upcoming issue!—SB

We started writing our programs some time ago using *Microsoft BASIC*. We soon became frustrated with BASIC because of its general slowness, especially with larger programs. We started to change over to the C language in order to speed the execution of our programs even though we prefer to write in BASIC, as it allows us to better concentrate on the "logic" of our programs and not so much on the "language."

I can now report that we have gone back to BASIC because of the *CLR Libraries*. These library routines greatly enhance the operation of *Microsoft BASIC* for the Macintosh. For example, we no longer use BASIC's "PRINT" function but rather the *CLR Library* function "DrawText" and "TextBox." These provide a tremendous "speed" improvement over the BASIC "PRINT" function.

Dick Rylander, Sr.
Citrus Heights, CA

DVORAK SPREADING TOO THIN

So far your magazine has proven to be quite useful. Keep sight of what makes you different from *MacWorld*: You seem to understand where the hungry Macster wants to go; your competition routinely prints articles about where I've already been. All *MacUser* needs is a writer with a keen sense of humor. Irreverence is, bullying no. Dvorak, I fear, is overworked these days, blabbering more from nervous energy than profound thought. Neither the computer industry nor the rest of the world needs another Don Rickles.

David Swift
Jackson, WY

BUGS APLENTY

General Computer released its 20-Meg disk with a print spooler feature. After checking with the company to verify compatibility, I obtained a free copy from my dealer and installed it. But, the more it was used, the more bugs began to appear in all applications. The slow decay continued until drawers locked up, applications were damaged beyond repair, and the system finally wouldn't even boot up. Turns out that all the new software is compatible except the System! If a 20-Meg System is installed on a 10-Meg HyperDrive, it slowly and methodically destroys its structure. The damage appears to extend even to floppies used as copy protect verifiers, and some data files.

My own case was complicated by a copy of *MacTracks* from Assimilation installed on the system. On each reconstruct, this was added back in. It wasn't

SQUINT! SQUINT!SQUINT!

THE VERDICT'S IN THE FINE PRINT!

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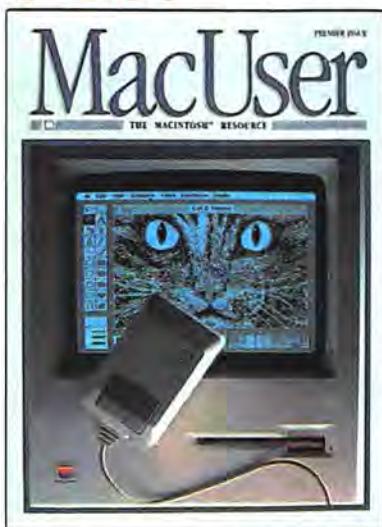
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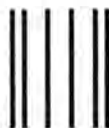
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until I noticed the frequency of Tracks File access error messages preceeding crashes that it was left out, and the improvement was immediate. It appears that *MacTracks* can also wreak havoc with a HyperDrive system, and it should be approached with great caution. Suggestion: experiment carefully with *MacTracks*, and use it on backup copies only, never a main disk. And only on a hard disk if you just love to tear them down and build them back up. Time after time after time.

Bob Hunt
Santa Ana, CA

WATCH OUT

Soon after I bought my external drive, I accidentally started to insert my disk upside down into the external disk drive. I got the disk about a quarter of the way in before I realized my mistake, and started to pull it out. I could not do it. Eject in the File menu, COMMAND-E, pins in the hole, etc. all failed.

My Apple dealer had to open the drive up to remove the disk. The disk drive has a mechanical probe near the front left which checks to see if the disk is in the locked or unlocked state. The hole in the disk for this is 3/16ths of an inch from the left side of the disk, near the front. If you turn the disk upside down, you will find another hole, exactly 3/16ths of an inch from the left side, 11/16ths inch from the rear of the disk. The probe had gotten caught in that hole, and would not let the disk out.

James L. Boettler
Orangeburg, SC

MAIL ORDER NOT CREATED EQUAL

I think many readers, myself included, would be interested in finding a consumer-type-report rating for the mail-order businesses as well as computer stores that are selling us Mac products. Such ratings would judge not only price, but whether or not these businesses had inventories as large as they advertised, good technical service and good responsiveness to customer complaints.

There are many consumer magazines that offer such services today in specialized areas of automobile and home repair businesses. Look at the daily newspaper columns that rate the restaurants. A bimonthly survey of mail order businesses offering typical products, that identified hidden and extra charges, that surveyed technical expertise and that measured time to delivery would assist us, your readers, tremendously.

Mikal A. Pedersen
Great Falls, VA



Richard "Lord British" Garriott—killing the real one's a capital crime!

SWEET VENGEANCE

I have become an *Ultima III* maniac ever since my friend let me play it on his Mac for a few days. I was marveled at the graphics and play action, but I also met with disastrous fate when I came upon Lord British. Like all full time adventurers, I thought my characters could take on anything so I went for the gusto and decided to attack him. Unfortunately, after about two hundred hits with my +4 bow, I found that he was invincible.

It came to my mind that there should be a solution to everything, so I played to regain my pride and avenge myself on the invincible Lord British.

First, your party must be on horses and must have several keys to unlock doors. Enter the castle and open the doors located on the left hand side of the castle. Attack one of Lord British's guards so that Lord British will try to attack you. Lead him outside, making sure that he does not reach you, and then once he is outside, go to the ship and board it as fast as you can. Take the ship toward Lord British and fire at him without going near the surface. It will take a mere five shots to destroy him. Then you have the castle all to yourself with every priest, guard, jester and whatever lives in the prison under your control.

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H.T. Cheong
Springfield, VA

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Having trouble getting past a particular spot in your adventure game? Maybe "The Book of Adventure Games II" can help. It's a compendium of descriptions, maps and clues for over forty popular adventure games for the Apple II and Macintosh, including Gateway, Fahrenheit 451 and

Hitchhiker's Guide to the Galaxy. The book won't give you outright answers—but it just might jog your imagination enough to (finally!) find the solution. "The Book of Adventure Games II" retails for \$19.95. For more information, contact Haba System/Arrays, Inc. at (818) 901-8828.—TFH

Malcolm Thain's limited edition MacDraw documents (usually printed with a Roland plotter) turned a section of the Australian exhibit at the San Francisco MacWorld Expo into an impromptu gallery. Mac enthusiasts gathered to admire and purchase Thain's works like the one above. After running off limited editions of his works, Thain destroys the MacDraw file.—TFH

MIGRATING YOUR LISA TO THE MAC

Own Lisa 7/7 software and want to make a permanent switch to the Macintosh environment? If you hurry, you can lay hands on the Macintosh XL Migration Kit, which transfers Lisa documents to Mac disks.

Conversion tools available are LisaWrite to MacWrite

and MicroSoft Word; LisaDraw to MacDraw; LisaProject to MacProject; and LisaCalc to Microsoft Excel and Lotus Jazz.

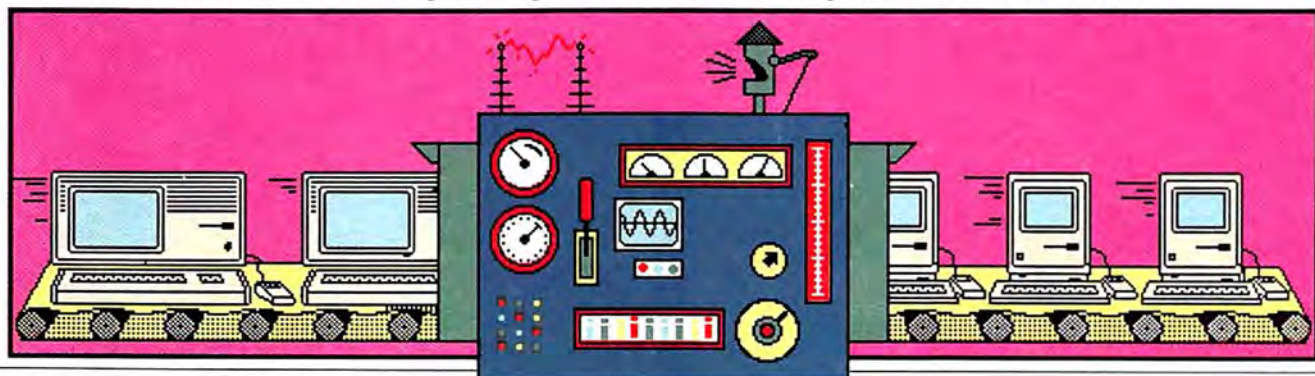
The conversion only works if you're using Lisa 7/7, version 3.1. Customers with version 3.0 must upgrade to 3.1 before performing this con-

version (authorized Apple dealers do this at no charge).

This offer only extends through May 31, 1986. The basic kit sells for \$30 and includes two Lisa installation disks and one Macintosh conversion utility disk. Two other kits are available for \$450 each: The Migration Kit-Lo-

tus Package (includes basic kit plus Jazz) and The Migration Kit-Microsoft Package (includes basic kit, Word, Excel, File and MacTerminal).

Contact your local Apple dealer, or call Apple Customer Relations at (408) 973-2222 for ordering information.—TFH



BERT MONROY

UPDATES

Do you have the latest versions of your programs? Most programs indicate what version they are when you look in the About... choice at the top of the Apple menu. If your version isn't the latest, contact the publisher about possible upgrades. Look for addresses in our MiniFinder section. Here's our list as of press time.

—SB

Aztec C	1.06g
BatteryPak	1.1
Choose Printer DA	1.5
ConcertWare+	3.0
Copy II Hard Disk	4.5
Copy II Mac	4.5
Excel	1.01
ExperLISP	1.04
ExperLogo	1.1
Factfinder	1.1
Fedit	3.5
Finder (HFS)*	5.1
Finder (MFS)*	4.1
FONTastic	2.5
Font/DA Mover	3.0a
Front Desk	1.0
Gato	1.3
Hard Disk Utility	1.11
Hayden Speller	1.2C
Helix	2.0 r5
Home Accountant	1.03
Jazz	1.0
Just Text	1.09

MacDraw	1.9
MacPaint	1.5
MacProject	1.0
MacSpell+	1.07
MacTerminal	2.0
Mac Tools	4.5
MacWrite	4.5
Mac Zap Copier	4.1
Mac Zap Tools	3.5
Mac Zap Patcher	3.1
MS BASIC	2.1
MS Chart	1.00
MS File	1.01
MS Fortran	2.1
MS Word	1.05
Multiplan	1.1
OverVUE	2.0c
PageMaker	1.1
QUED	1.21
Quick & Dirty	
Utilities, Vol.1	1.5
ReadySetGo	2.0
Red Ryder	7.0
Smartcom II	2.1D
Statworks	1.2
Switcher	4.4
ThinkTank 512	1.1
TimeBase	1.6
TurboCharger	1.11
VersaTerm	2.00

*HFS is Apple's new Hierarchical File System that comes in ROM in the Mac Plus, MFS stands for Macintosh File system and is the old, "regular" file system.

WOZ PUTS MONEY WHERE HEART IS

Steve Wozniak, designer of the venerable Apple II and co-founder of Apple, recently bought more than \$5 million worth of Apple stock and says he's interested in buying

more. "I'm not looking at it as an investment," he was quoted as saying in InfoWorld, "I just feel strongly enough connected that I should own some." —TFH

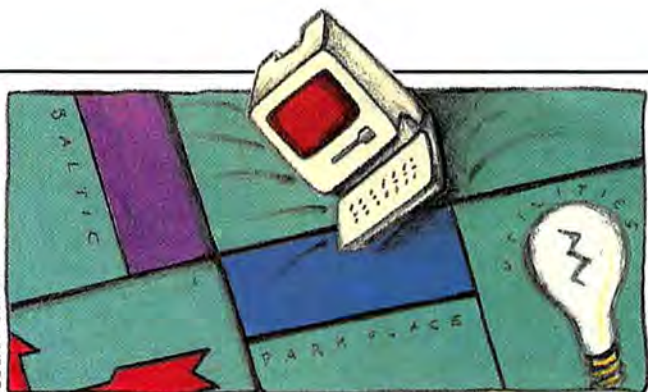
PAGEMAKER UPDATE

Aldus Corporation's PageMaker software has gone through its first revision, and version 1.1 of the program offers some new features, as well as some bug fixes.

PageMaker now supports an on-screen 11 x 17 inch tabloid format. Clearly, no current Macintosh printer can print sheets that large, so the user must print out two sheets and manually paste them together. PostScript printers other than the LaserWriter (Allied Lino-

type model 100 and 300, for example) that support larger page sizes will print directly in the larger sizes.

Users familiar with MacPaint 1.5 and the LaserWriter know that printing in final mode produces smoother images, due to a new smoothing algorithm. PageMaker now also supports this print mode for MacPaint graphics pasted into layouts. Improved formatting of text with tab settings imported from Micro-



SUSAN COHEN

REALTORS TO GET REALDATA

The National Association of Realtors recently signed a 3-year marketing agreement with RealData, Inc., makers of Real Estate Investment Analysis, which will make its entire line of real estate software aids available directly to the 680,000 member realtors. Among new releases being offered to the group are

el 1 and The Mortgage Qualifier, which run in conjunction with Microsoft's Excel. While the programs are primarily designed for the Mac, MS-DOS and selected CP/M versions of most RealData Inc. programs will be made available as well. For more information, contact RealData, PO Box 691, Southport, CT 06490, (203) 255-2732.—TFH



STORAGE BY THE BOOK

soft Word is also included.

There are also improvements in the program concerning the text editor, Clipboard, resource and memory management.

The upgrade has been sent out free of charge to all registered PageMaker owners. An installer program upgrades owners' original 1.0 diskettes. For more information, contact Aldus Corporation, 616 First Ave., Seattle, WA 98104, (206) 441-8666.—DB

The problem with some disk carrying cases is that the disks they're supposed to protect can fall out when you open or close the case. MicroStore's DiskBook holds up to 32 disks securely, opening from the side instead of the top to prevent too much jostling. Two closing binders (one on top, one at the side) keep the contents inside. The DiskBook is available in a variety of attractive colors, and sells for \$34.95. For more information, contact MicroStore, PO Box 37, St. Peter, MN 56082 or call (507) 345-7179.—TFH

New ON THE MENU

APRIL'S BUG OF THE MONTH

This month's winner is Daniel P.B. Smith from Boston, Massachusetts. He reports that *MacDraw 1.9* has a maddening bug (it was in version 1.7 as well).

When text and nontext items are dragged together, either because they are grouped, the text and nontext components move different distances, losing their relative alignment! This happens only if the grid

is on, and certain custom ruler settings have been made. Specifically, if the denominator of the major division size in inches multiplied by the number of divisions is not a divisor of 24, it happens. For 1 inch, for example, it will happen for 32, 16, 10 or 5 divisions, but not for 24, 12, or 8 divisions!

A \$25 check and a 1-year extension of his subscrip-

tion (for the solution) has already been sent to Dan. Get your bug reports in and you may be our next lucky winner. Send your reports to *Bugsy*, c/o *MacUser Magazine*, 25 W. 39th St., NYC, NY 10018. Remember to include all the details, such as what *Finder*, what fonts and desk accessories were in the system, and exactly how you stumbled on your critter.

AND THE PRICE IS RIGHT!

The flow of noncommercial and shareware software never seems to diminish. In just a few short weeks, some

are summoned through a Help menu. Rack'em up, Charlie!

●*CrashSaver* will get you out of many system bombs. Normally, the Mac must be reset (or switched off and on again) when one of these gremlins surfaces. Install *CrashSaver* at the beginning of a work session, and when the bomb explodes, simply hit the interrupt switch and the Mac returns to the Finder. It doesn't always work, but sometimes is better than never.

●*ConCode* is a desk accessory that simulates the operation of the 68000 instruction set. The user can type hex values into ethereal registers and preview the effects that an instruction will have on those values. This is a "must have" DA for programmers.

●*Other*... is the most logical desk accessory around. It lets the user temporarily install desk accessories in the apple menu. Similar to the *DA Preview* program, this is essentially the same, except in desk accessory format. Very

handy for trying out new DAs without going the *Font/DA Mover* route.

●*Camera* is a desk accessory that does screen and printer dumps. So what? It has a timer that can be set to do the dump after a specified number of seconds, and it will automatically blank out the cursor when the dump is created. For those that always forget the key combination sequence, here's the answer.

These are just some of the goodies we've run across. How does one go about getting them? The first place to try would be one of the larger communications networks (CompuServe, Delphi). Another good source are the various BBSs (Bulletin Board Systems) around the country. A modem and some perseverance will pay off. Your local Mac Users' Group probably maintains a library of public domain and shareware software. Try them. And enjoy some of the better bargains in the Mac marketplace.—DB

THE RUMOR MANAGER

There are lots of office pools at Apple these days. One of the most active is the one that pays off on when the 1,000,000th Mac is produced. The busiest is on when that Mac will be sold... the spell checker boomlet will continue with some real great programs and some astoundingly low prices... *MacLightning* will touch off a whole new Mac industry... colorizing equipment prices (currently \$10G and up) will drop by at least half as a lot of equipment is sold in 1986... enhancement packages that patch the new ROM (mostly to gain increased speed) will be very popular... the release date of the next new Mac is allegedly late August, with the announcement coming around July 4th... be looking for a significant change in the Mac interface that will be fully compatible with the current standards... by June 1st there will be more hard disks available for the Mac than there are databases... Apple will buy IBM (for cash)... a software biggie is about to quit the Mac market... two "big" names will be joining Apple to work on the next Mac. As a result some original Mac team members will leave Apple... heard much about the Atari 520ST and the Amiga lately?



incredibly polished and useful stuff has appeared on the grapevine:

●*Billiard Parlour* provides both billiards and regular pool in an electronic pool hall. On-screen animation, sound, and very precise control over hitting angle, force, and even ball spin (known as "english") makes this simulation one of the most entertaining noncommercial games we've seen. Six different games are available, and players take turns shooting against each other. Shots can be undone and even replayed (a pool shark's dream!). Full instructions and information



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Best of all, Lightspeed C's, integrated Edit-AutoMake-Launch environment makes turnaround a one-step process.

If you want to produce higher quality results with less time and effort, send for Lightspeed C today.

The above statements are based upon benchmarks for creating an executable version of XLISP v1.4 (16.5K source lines) from scratch and by modifying, re-compiling, and re-linking one source file. Comparisons were performed using a 512K Macintosh with a 10MB Hyperdrive.*

Generated code size (in bytes)
Program build time (in secs.)
a. compile
b. link-to-run
c. TOTAL pgm build
Turnaround time (in secs.)
(time to make a change to module xlcont.c)

Consulair (MacC V4.0)	Aztec (V1.06G)	Megamax (V2.1)	Lightspeed (V0.40)
36770	34566	44264	3387C
887	654	354	134
153	49	95	5
1040	703	449	138
211	108	127	9

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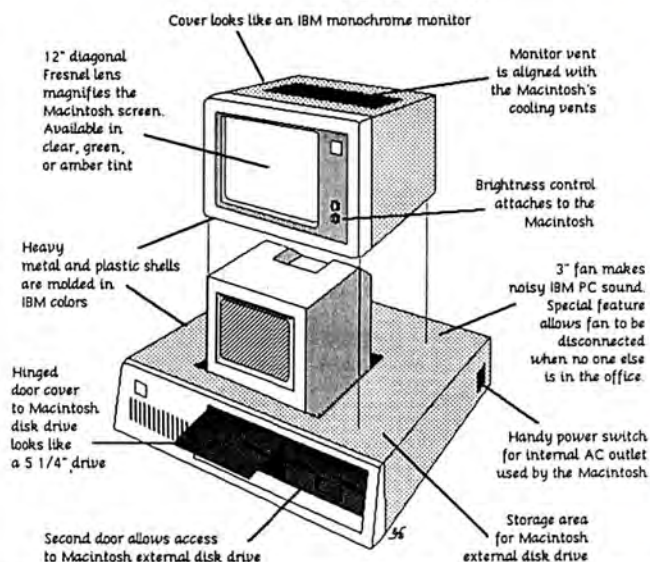
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New

ON THE MENU

MAKE YOUR MAC LOOK LIKE AN IBM

Ridiculed by Office-mates? Snubbed by Management? Sure, you can get your work done in ¼ the time of your co-workers . . . But why put up with the taunting and teasing when you can snap on this handy PC lookalike!



COULD IT BE A TREND?

In our January issue we said that *The Home Accountant* (by Haba/Arrays/Continental) was a fine program (it easily merits its 4-mouse rating), but it wasn't acceptable for keeping tax records due to its copy-protection scheme. That comment sparked a spirited debate on CompuServe's MAUG forum, involving users, potential users, a representative of the publisher and one of the program's authors. After all was said, the publisher responded by removing the copy protection. To which we can only say, Bravo!

The unprotected version is numbered 1.03. If you buy the package and get an earlier version, send in your warranty card to get 1.03. If you already have your free backup, send the disk marked "Backup" in and it will be replaced with a new, unprotected version.

Now that the product is not copy protected, it can be

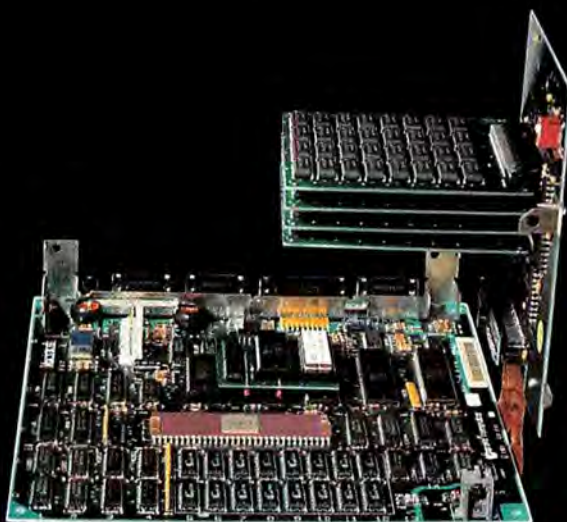
wholeheartedly recommended for keeping your tax or any other financial records. Be sure to make frequent backups of both program and data and don't give copies away.

The good people at Pro-VUE Development have also decided to unprotect their excellent database *OverVUE* 2.0. The unprotected version will be numbered 2.0c. This step makes an already superb product even better.

And Forethought, publishers of *FactFinder* and *FileMaker*, released unprotected versions of their products long ago.

The trend towards unprotecting useful software seems to be gathering steam. Let's hope it continues. It will if people make their feelings known to publishers, support the products that are not protected and, most importantly, not condone or participate in pirating these products.—SB

STEVE SAKURAI



Micro Conversions' 1/2/4™ Megabyte Upgrade

Inside every Macintosh beats the heart of a superb machine. However, the sad fact is, most Macs will never have enough memory to run the major integrated software packages wholly from memory. Or perform other tricks. But yours can.

Available in 1 Meg, 2 Meg, or 4 Meg configuration, the Micro Conversions 1/2/4 Megabyte Upgrade is a modular and expandable memory system that will give you both the room to run and the room to grow. Since the Macintosh operating system can address only up to 4 Megabytes of RAM, the 1/2/4 is the ultimate memory system. And the 1/2/4 is HyperDrive® compatible.

SUPERPOWER MACS

The first enhancements for the Macintosh have already been announced. Some of the most spectacular promise to be two new products from General Computer Corporation, makers of the HyperDrive.

The first product is called *HyperNet*. It is advanced disk server software that allows up to 25 Macintoshes to share a number of HyperDrives that are connected via AppleTalk. *HyperNet* updates the file/directory information on the server Mac in real time when a client Mac makes a change, unlike currently available software. Drawers are mounted remotely and users see what appears to be one integrated network of disk servers. The new software will run on existing HyperDrives as well as the new HyperDrive 2000.

The other new product is the HyperDrive 2000. It has an additional 1.5 megabytes of RAM (for a total of 2 megabytes); a new 68000

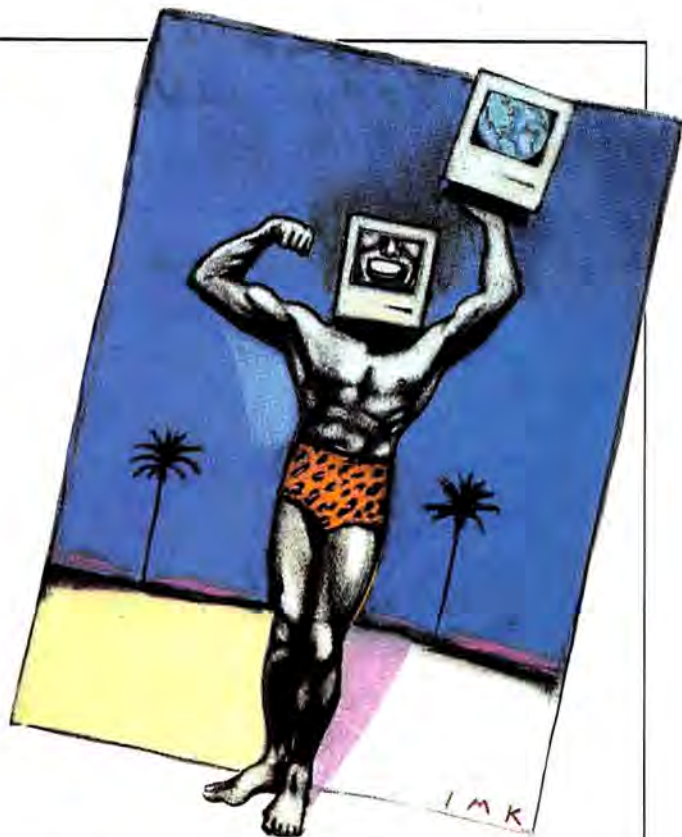
CPU running at 12MHz instead of 8 MHz, with no wait states; and a 68881 floating-point coprocessor.

The Macintosh case is not modified—externally, nothing looks different, but the overall speed increase is astounding, much better than what the upcoming Macintosh Plus offers. The HyperDrive 2000 will be available as an upgrade to any of the current HyperDrive products, and should be compatible with the new Macintosh Plus as well, although it will not be running Apple's new Hierarchical File System (HFS). The 68000 speed-up doubles the effective speed of the Mac, because RAM is no longer hampered by "wait states." The 68881 coprocessor increases the speed of all SANE mathematics by trapping the calls. In addition, Consulair will have compiler support for the coprocessor that will provide 20–250X speed-up of some operations,

particularly graphics.

Both products should be available by the time you read this. Pricing was not set at

press time, but a fully equipped HyperDrive 2000, with *HyperNet* software, will list for over \$5000.—SB



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MacBuffer®

See your local Apple dealer for the first hardware printer buffer designed specifically to increase productivity of Macintosh print functions! Significant features include:

■ MacBuffer speeds your printing functions three ways:

1. Macintosh to MacBuffer transfer rate is 6 times faster than standard Mac to Imagewriter data transfer.
2. First character in the buffer initiates the print cycle. No waiting. MacBuffer operation is completely automatic with no complex Operator set-up required.
3. Once data transfer is complete, MacBuffer completes the print cycle,

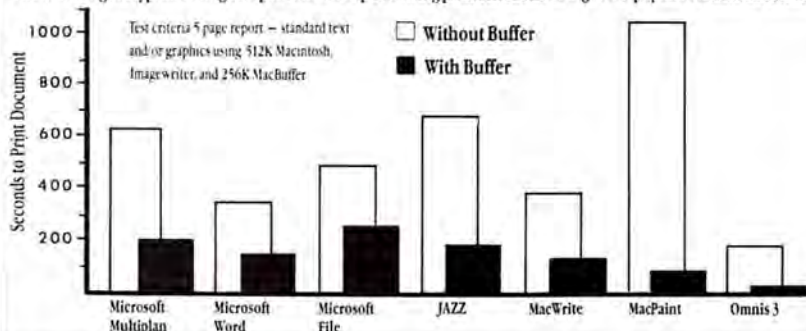
leaving the Macintosh Operator free to prepare the next report or pursue other functions.

- MacBuffer's memory size is designed to handle the extensive data storage requirements necessary to optimize Macintosh print functions, i.e. (a single page of standard text and/or graphics can require up to 50K of memory while a page of high resolution text and/or graphics can require up to 200K of memory). MacBuffer's storage configurations offer significant

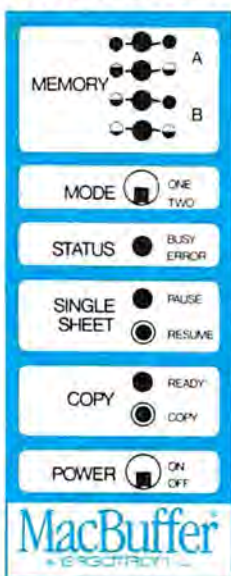
advantages over print spoolers or other buffers whose memory limitations make them ineffective in the Macintosh environment.

- MacBuffer's microprocessor eliminates the stolen memory cycles and computer overhead associated with the use of print spoolers.
- MacBuffer allows two Macintosh computers to share a single Imagewriter. No manual switching is required. MacBuffer will dynamically allocate memory as reports are received from each computer, or the memory may be partitioned by the operator. In either case printer utilization is greatly enhanced!
- MacBuffer is easy to install. It comes complete with all hardware, software and cables, ready for immediate use.
- "Copy" and "Pause" functions allow automatic printing of multiple copies and Pause between sheets in single sheet operation.
- Internal self-test to verify reliable operation.
- Imagewriter and Imagewriter II compatible.

MacBuffer offers dramatic reduction in Operator/Computer Wait times when performing Macintosh print functions. The following are typical timing comparisons when performing print functions using some popular Macintosh software.



MacBuffer Operator Panel



- Memory Indicator - indicates % of MacBuffer memory in use.
- Mode Switch -
 - Mode one - used with one or two Macs. Memory is dynamically allocated on a first-in, first-out basis.
 - Mode two - used with two Macs. Memory is partitioned 50%/50% between each computer.
- Status Indicator - indicates MacBuffer is transmitting data to the printer. Flashing indicator indicates memory or transmission error.
- Single Sheet Indicator/ Push Button - Depression places MacBuffer in Pause mode, illuminating indicator. As each page is printed the printer stops, allowing operator to insert new page in printer. Depressing "Resume" switch reinitiates print cycle.
- Copy Indicator/ Push Button - Depression places MacBuffer in copy mode, illuminating indicator. Subsequent switch depressions determine number of copies to be printed. In copy mode Memory Indicator indicates the first and last four copies to be printed.
- Power Switch - applies power, clears MacBuffer ready for use.

Technical Specifications

Microprocessor Controlled

Memory Configurations

- Model M-256 256K
- Model M-512 512K
- Model M-1024 1024K
- factory upgradeable

Data Transmission Rates

- 57.6K baud in standard
- 9.6K baud out standard
- 9.6K baud in/9.6K baud out available
- 57.6K baud in/57.6K baud out available

Operating Environment

- Temperature 32°F(0°C) to 122°F(50°C)
- Humidity 10% to 95% Relative Non-Condensing

Power Requirements

- 117V ± 10% 60 Cycle
- (220V ± 10% 50 Cycle optional)
- Power Consumption @ 117VAC
- 9 Watts maximum

Physical Dimensions

- Height 5.375 inches (13.7mm)
- Width 2.250 inches (5.7mm)
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GHOST OF A CHANCE

by Michael D. Wesley

Mac businesses have sprung up in some interesting places. As was the case in the early days of the personal computer business, Mac software and hardware developers often work out of their basements, garages, back rooms, even attics. Sometimes they work out of other people's basements, garages, back rooms or attics—like their parents'.

I know of at least one Bay Area company that worked out of an attic until recently. You got to their "space" by climbing a somewhat rickety wooden ladder located just behind the cluttered office of a community theater. Upstairs, half a dozen Macs and Lisas in various states of undress were scattered across several makeshift workbenches. Half a dozen young people worked intently on numerous projects, talking enthusiastically and knowledgeably about hardware design and marketing while their heads scraped against the ceiling. Of course the advantage to such a setup is the low overhead.

Companies like this exemplify the joys and pains of entrepreneurship—the American dream of starting your own business. Entrepreneurial companies have varying degrees of success. Some of them have difficulty ever arriving at a finished product, or run out of money before they get the chance. Others get a working product out the door but for any of several reasons cannot build or sustain a market for it. Still others achieve a measure of success and continue for a long time as small, family-type operations.

The computer industry has had its share of highly successful entrepreneurs, companies that literally began in the garage or basement and have gone on to generate sales in the billions.

In a very real way, these companies grow so big and so fast that the entrepreneurial spirit can get lost—buried in bureaucracy, paperwork, and office politics. When the entrepreneurship has sailed, some big companies have started to bring in a new ship to take its place—intrapreneurship.

Someone has a great idea that the

company, a large multinational computer maker, for example, recognizes as a great idea (not a small feat in itself). A separate organization is set up within the company to make the idea happen, giving the managers and idea people a chance to start their own company, yet stay under the protective umbrella of mother. In this way, key people stay with the company rather than going out on their own; the company can explore new markets in creative ways, and a good idea doesn't fall through the cracks.

The creation of Macintosh is a pretty good example of intrapreneurship. Apple is a place that seems to generate lots of good ideas.

Preneurship aside, even big computer companies have to draw the line somewhere. Some projects are too big, too small, or too competitive with third party products to justify developing them, even intrapreneurially. A great idea for a nice little piece of software or hardware, perfect for a nice little company, may still fall through the cracks in a multinational computer company.

With all these preneurships in the water, there must be one especially designed to navigate these treacherous seas. We have entre- and intra-, so what's missing?

Something extra: extrapreneurship. If the big computer company (not wishing to tread on the toes of the third-party developers it needs in order to sell its computers), has a great little product, perhaps it could seed a new little outside company. One or two management people, originally involved in the creation of the product in-house, could be set up in

their own great little company to develop, produce, and market the great little product. Ultimately, it belongs to the big computer company, which quietly retains the copyright or patents.

The big company could launch several extrapreneurships, then let the new company's principals take the ships as far as they could. This would be advantageous for everyone. The more companies there are developing software for a given computer, the better it would be for the big computer company, because software sells computers, and the better it would be for consumers because there would be software solutions for a wider variety of problems. Extrapreneurship would even be advantageous for small or medium-sized third party companies because they would be competing with companies their own size, rather than having to face the big computer company head on.

Extrapreneurship, which essentially boils down to ghost publishing, is a very interesting concept. Perhaps I should suggest it to some big computer companies. Or maybe they've already discovered it. That might explain why some third party Macintosh products have the words "Copyright Apple Computer" embedded deep within their code.

I don't think we have exhausted the possibilities of preneurships yet. I would like to propose one more: retropreneurship.

A big software company puts pressure on a big computer company to keep a product off the market because it would compete unfairly with the software company's product. "Unfairly" because the newcomer is better, for example. You'd think that the big computer company would simply be stuck with a dead product. But people inside the computer company might really like their product, and be unhappy that it got killed.

The designers or programmers may have to send the product out the only way they can—through the back door. The "dead" product is handed discreetly to close friends and begins quietly to appear on bulletin boards. In short order it becomes a cult product, a must for every discerning owner of a given computer. Retropreneurship—another interesting concept.

NEW STUFF

Moving back to dry land, an entrepreneurial company called Symmetry is doing some very interesting things. Its latest offering is a program called *Picture-Base* that catalogs *MacPaint* images in files. Images can be found by key words attached to their file, or users can scroll



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through the file picture by picture. Full page *MacPaint* works can be seen and manipulated in miniature, so it is easy to copy a larger-than-screen image from place to place. *PictureBase* looks like it could be a valuable product for anyone who keeps a large collection of clip art, designs, or other *MacPaint* images.

Symmetry is currently working on another exciting product called *Acta*, although it may not be quite finished when you read this. *Acta* is an outline processor that works as a desk accessory. Ideas can be put down in topics and several levels of subtopics, all of which can be moved around as the outline takes shape. A built-in formatter takes a completed outline and automatically formats it according to any of several types (I.A.1., 1.1.1., etc.) Text can be moved freely from *Acta* to any Mac word processor or text handler (spreadsheet or database, for example) and back again. *Acta* should also be worth a close look. (Symmetry is a Mesa, Arizona company that can be reached at 602-844-2199.)

Racal-Vadic, makers of communications equipment and modems, is putting together a terminal package for the Mac. Called *MacGeorge*, it is a very easy to use, Mac-enhanced version of its George software for the IBM PC, with full windowing and menus. *MacGeorge* will come complete with a modem cable and tiny screwdriver so you'll have everything you need to get started in communications except a modem. *MacGeorge* will work either with Racal-Vadic's line of modems or other Mac modems. It is supposed to be fully Hayes compatible. (Racal-Vadic is located in Milpitas, CA, 408-946-2227.)

On a final note, Dash Chang of Chang Labs, makers of *Rags to Riches* accounting software for the Macintosh, believes that software should emulate human thinking processes. In this way, programs are intuitive to operate by design, not just because of flashy windowing or point and click. *Inventory*, the latest and perhaps the best product in the *Rags to Riches* line, is an example.

Inventory will be able to act as a receipt generator at point of sale in small businesses and track incoming and outgoing product movements. With a myriad of built-in reports, *Inventory* can help the small business person get a better handle on what products sell and why. According to Chang, it will work well as a standalone product, or will integrate with other *Rags to Riches* modules. *Inventory* will sell for \$195, the same price as the other modules. (Chang Labs is located in San Jose, CA, and its number is 408-246-8020.)

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SUPERMAC
TECHNOLOGY

Introducing DataFrame

The hard disk Apple used when they introduced the Macintosh Plus

When Apple rolled out their first major new product in almost two years, you know they weren't about to skimp. Not with millions of dollars of sales on the line, and John Sculley on the stage. So when Apple told us they had chosen our modestly priced DataFrame 20 megabyte hard disk to help demonstrate their new computer, we were very flattered. Especially since Apple had never before shown, let alone introduced, any of their computers using third-party hardware.

Why DataFrame? Because DataFrame was designed especially for the Macintosh Plus. It's the first hard disk to take full advantage of the new high performance SCSI port that comes with every new Macintosh. DataFrame is not only faster than competing external disks, but faster than internal drives as well. And Apple wanted to demonstrate this big advantage over the older 512K Macintosh.

But DataFrame's design is just as important as its performance. The drive comes preformatted so it's simple to hook up — just connect it to the computer and switch it on. DataFrame boots from the hard disk with no floppy required. It takes full advantage of the new hierarchical file system, so all 20 megabytes are available all the time. And if you need even more storage you can daisy-chain up to eight drives or other SCSI-compatible peripherals.

But what really made the difference is our reliability. DataFrame's field-proven 5¼" disk drive has seen service in more computers than all the 3½" drives put together. Its 40 g shock rating is almost 50% greater than that of competing units for better resistance to the everyday bumps and jostling that can cause disk failure. And our advanced VLSI controller uses less than one-third the power of competing units — so DataFrame operates coolly and quietly without a fan. It all adds up to a system so dependable that Apple chose it over every other SCSI drive, and even over their own HD20.

So if you're getting ready to roll out a high performance hard disk with your Macintosh Plus, whether in front of the whole world or just the whole office, consider the only disk that was good enough for Apple — **DataFrame**.

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THE FAMOUS COMPUTER COLUMNISTS' SCHOOL

by Doug Clapp

You'd like to be as wealthy as me, wouldn't you? And as witty—yet profound. Not to mention my dashing (yet endearing) good looks.

I can't help you with looks. I can, however, help you become a Famous Computer Columnist. Everyone, of course, wants to be a Famous Computer Columnist. The work's easy, the pay is good, you get to be a "somebody," and—best of all—you can scam lots of free stuff.

Sounds good, doesn't it? Read on.

First, find a magazine. This won't be hard. Even with magazines dropping like flies (I never liked Dave Ahl anyway), there are still plenty of magazines that'll take you on. Magazines like knowing they've got a regular chunk of something to put between the ads. Pick your target.

Next, submit a few sample columns. These should be provocative, opinionated, slick and easy to read. Here's how to do it: be fervent. Everyone loves fervency. Or is it ferventness? Anyway, do that. You can be dissipated and boring and pompous and self-indulgent and full of angst later on. For now, be fervent. And perky. If you can't manage perky, be passionate. Be passionate about copy protection; that's an easy one. (A hint: be against it. Passionately against it.)

Write a few sample columns. Make them all the same length. Send them in. Give the impression that you're prolific, punctual, and easy to work with.

That should do it. You're now a Computer Columnist. Kick back.

No, don't kick back. It's dog eat dog out there. Being a columnist isn't enough; you've got to claw your way to the top of the heap. After all, you want to be a Famous Computer Columnist! Sure it's "Dynasty," but it's necessary. If you're not at the top, your column can be dropped. No columns, no checks. You probably couldn't get a real job anyway. Sharpen your fingernails.

Now the important part: be remembered. Being remembered is more important than being right, or being "nice," or anything else. If you're remembered, you'll be read again. And you'll get "word of mouth." You're on your way when people mention your name.

How to be remembered? The easiest way is to be a jerk. Be mean, be critical, be a jerk. Dump on people, companies, and things. The nastier the better. You'll be remembered. It works. Trust me.

Besides, it's hard work to be fair, or to accurately analyze anything or anybody. That takes time and effort and understanding. You're not getting paid enough for understanding.

It's simple contrariness. Find out what everybody likes, then dump on it. Or cheerlead for a despised underdog: that's also a good tactic. Pick a hunk of junk, then tout it as "really the best system." Junk abounds; it shouldn't be hard. (And don't be afraid to go overboard. Cheerlead for a ridiculously lousy system like the Atari ST. Nobody will believe you, but people will think there must be a hidden meaning in the column. Hidden meanings are good—they make you look profound.)

But don't settle for being a mere jerk. Be an arrogant jerk. When you want software or hardware, call up and ask for it. Say you want to write about it. (You usually won't write about the products,

but say you will—companies like that).

Be rude and demanding. Look at it this way: advertising is incredibly expensive. Free publicity is, well, free. Any fool knows that. (Except Lotus, that is. If you can scam free stuff from Lotus, give me a call; we need to talk. I wrote a book about Jazz and couldn't scam a single release copy!)

Start scamming, start being a jerk, and start cultivating contacts. Be obsequious (don't know what that means? Look it up, Pinhead!) to a few select vendors. They'll give you "inside stuff" you can use in your columns.

There's never enough "inside stuff," though. That's okay. Don't be afraid to make stuff up. Who's to know? Try this: "Apple's Ultra-Mac project has produced its first prototype machine. It's rumored to have 1024 by 1024 resolution, with a palette of 256 colors."

How'm I doing? (Oh, don't get nervous. Nobody will remember your little fictions. What they *will* remember is that you deliver "inside stuff." That's what's important.)

Next, start expanding your fame. Hang out with Rich Computer People. Let it be known that you hang out with Rich Computer People. If you can't hang out with Steve Jobs, hang out with Wozniak. Or Bill Budge. Or Chris Crawford. (By the way: name dropping is always good.) Or Jerry Pournelle's aunt. Anybody, even Formerly Rich Comput-



© BONO 1986

er People or Failed Capitalists will do, in a pinch.

Get involved in other projects. You probably can't program, because programming is hard. (Pretending that you can program, though, is good. Go ahead; pretend; nobody will make you prove it.)

Write a few books. You're a computer columnist. Getting a contract will be easy. You can't write anything but columns? Don't sweat it! Have one of your friends ghost write the books, for a fee. (It's easy. It works. It's been done.)

Go to all the computer shows. Be a speaker. Go to all the parties. Throw a few parties. Schmooze. You gotta schmooze. Think of it as glad-handing for the eighties.

The alternative (or possibly adjunct) to schmoozing is hiring a public relations firm. A PR firm can write your bio, get you on radio and TV talk shows and make you a "somebody." A top firm, like Rogers & Cowan in LA, will nick you for \$3,000 a month.

Schmoozing is cheaper. Name dropping is cheaper.

Now that you're well-known, it's time to flex your muscles. Destroy somebody or some company. Ravage them in print. Ravage them thoroughly and completely or snidely and off-handedly. Either will work.

This, besides being immense fun, is necessary. You can't be a Famous Computer Columnist unless you're also Somebody to be Reckoned With. Do it. Blood under the nails is good for your career.

Mix praise and a few "discoveries" in among the ravaging. It'll solidify your "Insider status." It'll help you get more free stuff from little companies. Think synergy.

And that's it! It's easy, it's fun, it's "doable." Go for it.

Have a nice April, everyone.

PS: My editors at *MacUser* read this column, then pointed to the column's title and said "You didn't say anything about the Macintosh."

Okay, okay. How about a little "What's hot and what's not?" Charlie Jackson does it in *MACazine*, I can do it here. Here's what's hot: Mac Underground, *TMON*, *MacEasy* from Aegis Development (a must-have for Mac C programmers), the Skipfinder desk accessory (shareware), and *PowerMath* from BrainPower.

What's not hot? The Amiga system software (quick, hand me a spoon), and anything (except games) that's copy protected. I'm passionately against copy protection (wouldn't ya know?)

"Mac Underground is a dream come true for Macintosh™ Power Hardware People!"

Doug Clapp, co-author of *The Complete Macintosh Sourcebook*

Hi. I'm Jerry Daniels (national director of Mac Underground) sitting in for our regular corporate image--Mr. Rick. We chose Rick and his French Resistance image to illustrate our position as distributors of high-grade intelligence, far-out equipment, and technical support.

You've probably seen Mr. Rick in our other ads. He's a good guy, but he smokes too much...so while he's away at a smoke-enders weekend, I thought I'd slip in and comment on Doug's quote.

Doug Clapp became a member of the Mac Underground last summer. I'm pleased that--as a member--he thinks we're the organization for Mac power hardware people. WE think we're spreading the power of the Mac over a larger base of people--and creating more power users.

The Underground does give you a "power edge". We supply you with first-hand knowledge and direct access to equipment that will transform your Mac. We help you discover the souped-up, super computer you need to ride the tumultuous waves of the information age all the way into the twenty-first century.

A TICKET TO RIDE

A ticket to the future via the Mac Underground will cost you \$39.95. It's good for a year. For that kind of money you get a copy of our telecommunications software *Underground Courier™*, twelve months of unlimited entrance (via your modem and phone) to an *Underground SafeHouse™*, free member classifieds, and access to outrageous discounts on hardware, software and accessories for the Mac direct from Online Publishing Systems. (More on OPS later.)

Let's get back to Courier and the Safe-Houses it accesses: we think Courier represents a real landmark in telecommunications. You use it with a Hayes-compatible modem to point/click your way into a local SafeHouse.

Once in a SafeHouse you can copy daily intelligence reports, Mac article abstracts, art, documented public domain programs, and demo software. You can also send messages to your MU Bishop™ (the person who runs your SafeHouse). But local SafeHouses are not just outlets for our info. Read the next column.



A STRATEGIC ALLIANCE

The Underground SafeHouses provide service, support, and installation for a company called Online Publishing Systems. OPS is an Apple value-added reseller (VAR). OPS sells its Mac value-added products directly to our members. This is the same sort of strategic alliance that Apple has with General Electric. Maybe on a different scale, though, huh?

For some, our best feature is still the great deals on products that OPS offers to our members (and other selected clubs, fraternities, and associations). These products include innovative hardware items like the *OPS Internal Mac Modem* designed by Larry Dziegielewski, master engineer for OPS.

YOU CAN GET INVOLVED

If you look at the list of SafeHouses below and don't see your state, you should apply for a SafeHouse license. Licenses aren't free, but you've probably got the hardware you need to get started, and Bishops make money! (No vows of poverty here.)

Maybe we really are a dream come true! Call us and decide for yourself. Ask for a complete dossier on the Mac Underground (brochure for those who don't like spy jargon). Or, better yet, just get it over with and join the Underground. Doug can't be that far off, can he?

FOR MORE INFO:
MAC UNDERGROUND
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Fairfield, Iowa 52556
(515) 472-9613
10AM-4PM Mon.-Fri.



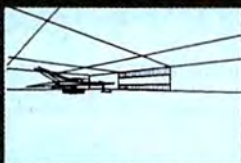
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Did ya ever have one of those days? Like the horn on the car getting stuck while following a funeral on the freeway? Or the 24-hour teller going on the fritz after it has swallowed the card? Or the I.R.S. showing up—and they "want to help"?

MacWars will vent the frustrations of life on this planet by taking you to a world of fantastic lightening-quick animated 3-D graphics and digitized sound.



Feel the day fall off those weary shoulders by jumping into the space interceptor and take off for the planet sized space stations' surface. Attacking one wave after another of defensive fighters, while knocking out the intricate surface defense system, make them all pay by blowing up the final objective—the heavily guarded main power generator. The makers of **Harrier**

SHIELDS 22 MACWARS SCORE 148

Strike Mission bring to the Macintosh the ultimate in space adventures guaranteed to bring endless hours of self-indulgent fun and excitement, without having to share it with anyone! **MacWars**—the empire awaits!



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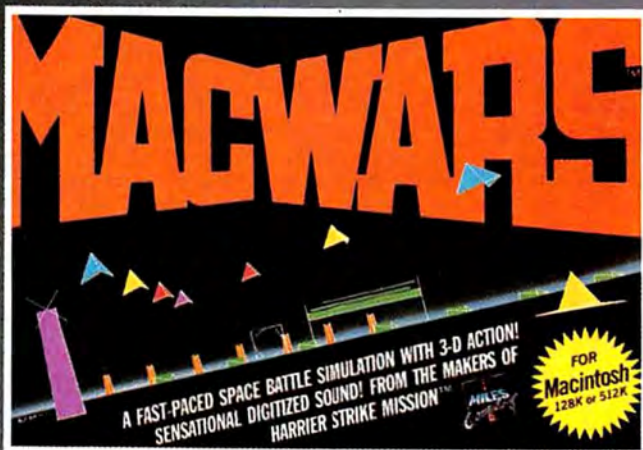
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The MagNet™ 20 Meg MultiUser Internal Hard Drive

The MagNet 20™ Hard Drive

Mirror Technologies introduces one of the most powerful Macintosh hard drives available. The MagNet 20 combines great value, expandability, speed and portability to give your Mac amazing capabilities.



This Internal Hard Drive Is Fast And Portable

Mirror Technologies has teamed up with Infosphere, to develop a special version of MacServe™ (XL-Serve, the predecessor of MacServe, is the **most** popular AppleTalk™ network software in the world!) MacServe software adds all of the capabilities and features of the best Mac hard drives available today, plus the ability to share peripherals, programs and data with multiple computers. As your needs grow the MagNet 20 already contains the power and versatility to handle your computing to go.

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Purchase the MagNet 20 as a **very** powerful single user drive and simply add the inexpensive AppleTalk network cables to allow multiple Macs to access shared programs, data and peripherals!



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Q U I C K

What's new, what's happening in the world of Mac? We'll keep you up-to-date with our monthly Quick Clicks.

SPANISH GRAMMAR III

List Price: \$34.95. Published by Queue, 5 Chapel Hill Dr., Fairfield, CT 06432. (203) 335-0906.

SPANISH GRAMMAR III, ONE IN A SERIES OF FOUR programs on Spanish grammar, is a tutorial program meant for teachers to use with students who require reviews in the Spanish language. It is not targeted for beginners or anyone who wishes to start a new language from scratch. Previous knowledge of the language is needed to get any value from it. Even the manual is clearly labeled "Teacher's Manual."

Spanish Grammar III's interactive nature



uses multiple choice and fill-in formats. A lesson selection is made by clicking on one of the ten grammar lessons, which brings up a name input screen. Then the selected lesson starts with a brief synopsis of usage, and examples for the grammar being tested. (This is also available in the Help menu for easy access during a lesson.)

Lessons can be approached in any order, but it's best to handle each in succession, since each lesson following is built on ideas introduced earlier. The user has the choice of working on one, two or as many lessons as he or she can handle at a time. In the beginning of each module there are instructions as to how the review is to be approached. One question at a time appears on-screen, with the keyboard or mouse used for responses. The keyboard can be used to enter an answer in a box with a cursor that follows the question, or students can answer simply by clicking on any of the boxes labeled A to E. Feedback is immediate and responsive. When a student answers incorrectly, the correct answer is shown and explained. A Time menu allows the user to see how long the lesson has taken so far, although Spanish Grammar III does not allow for saving a lesson to resume at a later time.

At the end of each lesson there is a summary with data on how many questions

were attempted, how many were correct, and a percentage-based score for the user, which is automatically added to the Teachers Management Report. (The Score menu gives a condensed form of this for viewing during a lesson.) The Teachers Management Report allows the teacher to check on students' work. Up to 20 names per screen are listed for each module worked on and for each time, even if the module is done twice. After 40 records, the 40th record is automatically deleted when the next person uses the program since new names are entered from the top.

The Management system is meant only for the teacher's use and, therefore, is put on-screen in a very obscure system so students can't get to it on their own. To select the Management Report, the teacher clicks in a circle at the upper right hand corner of the title screen. Progress for each student can be viewed on screen, printed or erased. A major design flaw in the erase option is that it clears the whole system of all the records when put into operation. Any one record for any student cannot be erased on its own. That means the only way of keeping a record permanently is to print it out.

Despite its minor flaws, Spanish Grammar III carries off what it means to in a clear and constructive manner.—DG

A MIND FOREVER VOYAGING

List Price: \$44.95. Requires at least 512K. Infocom, 125 CambridgePark Dr., Cambridge, MA 02140. (617) 492-6000.

INFOCOM HAS A PROBLEM. ITS DESIGNERS HAVE TO try harder to get Mac owners' interest because their games avoid all the joys of the Mac interface. For Mac users, text adventures start out in second place. There is no use of the mouse, or of the graphic and sound capacity of the machine. Adding insult to injury, Infocom persists in using pictures of IBM disks on their Mac packages.

Despite these handicaps, *A Mind Forever Voyaging* has a gripping, imaginative story and poses enough mental challenges to thoroughly engross most players. The plot is truly unique.

Players are asked to assume a most unusual role. They begin by reading a short story, provided (heretically) in hard copy in

the game package. Once you start out, you are given the shocking news that your lifetime of experiences and memories was carefully engineered. You are not human; you're an experimental computer.

Most of the difficulty in the game lies, like an infant initially testing the capacities of its body and mind, in learning how to use your senses and abilities. In one of your memory modes, you are a young married man with a career and a son. In other modes you're unable to touch, have no human (body) functions, but do have other powers.

Your task is to determine the viability of a special and crucial government plan. You can utilize one mode to visit the future. Your task is to bring back recordings of specified elements to be reviewed by a committee.

An innovative aspect of the game is that you'll gradually come to the realization that you are "on your own" after the initial task has been completed. Considerable initiative is required to complete the next two phases of the game.

On the negative side, the setting is more

humorless than most Infocom games. And some of the tasks become repetitious. AMFV does not warrant its advanced category rating. After the difficult adaptation to the role, there are only a few actual puzzles to be solved. One of these puzzles (in spite of exalted promises about the fine parser)



is precisely how to phrase what you want to communicate to the game. The instructions have you believe there are no such problems. Despite these drawbacks, AMFV is a true adventure and a trip in imagination well worth taking.—Linda Joan Kaplan

C L I C K S

THE DUBL-CLICK CALCULATOR CONSTRUCTION SET

List Price: \$99. 512K. Published by Dubl-Click Software, 18201 Gresham St., Northridge, CA 91321. (818) 349-2758.

THE DUBL-CLICK CALCULATOR CONSTRUCTION SET makes it easy to design custom calculators that install as desk accessories on your Mac disks. Using MacPaint-like tools, pre-designed keys are dragged onto a calculator shell and positioned. The shell can be stretched with a "rubber band" tool and can be much larger than it initially appears.

A parts box window contains all the shapes and special items that can be

placed on a calculator. There are four basic types of keys—alphanumeric, function, programmable and macro—in a variety of



shapes. Keys are dragged onto the shell, then "wired" (assigned a function) by clicking on the key with the electrical plug icon. Macro keys are assigned a permanent sequence of specific operations as the calcu-

lator is being built. Programmable keys can be assigned new functions at any time.

The calculator shell can hold up to 100 items (which may include icons to print to the ImageWriter or a text file), a small calendar, or various timer functions, as well as standard mathematical, financial and scientific operations. All of a calculator's keys can be wired so that entries can be made directly from the keyboard.

Calculators are saved as desk accessory files that are loaded with Font/DA Mover, or they can be made to self-install automatically on the startup disk. Finished calculators take at least 7K of memory. A scientific calculator with special features may take 20K or more. The program checks available memory before installing a new calculator.

The manual is small but excellent, and *The Dubl-Click Calculator Construction Set* is easy to use.—MDW

RECORD HOLDER

List Price: \$49.95. Software Discoveries, 99 Crestwood Rd., Tolland CT 06084. (203) 872-1024.

RECORD HOLDER IS FAIRLY SIMPLE, BUT IT'S A powerful data manager. Its strengths are its ease of use and price. There's a lot here, far more than its low price would seem to promise.

Set up is flexible. Users simply create what fields they wish on a master record. Using simple click and drag techniques, a very large number of fields of very large size can be quickly created. Fields can contain up to 32K characters (when working on a 512K or Mac Plus). Fields are specified to be of a particular type (text, numeric, date, etc.). The arrangement can easily be modified, except for the field type. Unfortunately, only the default font is available and graphics cannot be added to the records.

Data entry follows standard Mac conventions. A nice feature is an automatic Save feature, which periodically saves your work,

minimizing data loss if a crash occurs. Dates are particularly well handled, as the program has the ability to convert dates between its three formats.

Files have a table of contents in the form of a scrollable window that lists all that file's records. Double clicking on a record name brings that record to the screen.

Reports are well handled. Simply arrange the fields you need on a report form. These forms can be up to 16 inches wide and can include page headers. Mathematical functions such as total, average and count are available. After setting up the report template, users select what range of records is to be scanned for the report.

Searching records is the heart of the data manager function. *Record Holder* searches better than the average database. The search functions are both simple to use and, at the same time, versatile. They can contain wildcards. Indeed, it is possible to search on virtually any part of any element of any field.

Reports can be previewed to the screen and printed to the ImageWriter. They don't print correctly on the LaserWriter.

The manual is written for users who are not database pros. It's nice to see a manual so well planned for the program's target audience. There is also considerable on-screen help. Most users will read the manual to get started and then never require it again.

Record Holder isn't for everyone. Its lack of advanced features and its inability to use other than its default fonts (and total lack of graphics) limit its applicability. But if the features are sufficient, and they are for many applications, this program is a true bargain.—SB



GRID WARS

List Price: \$39.95. Published by Ann Arbor Softworks, Inc., 308½ S. State Street, Ann Arbor, MI 48014. (313) 996-3838.

"I NEED A DRINK!"

Wiping the comet dust of his shoulder, the unwary human looked around the bleak insides of the bar. "Sparks," he thought, "of all the places I have to walk into, I choose this dump. Looks like something

out of that old movie, hell, was it called *Space Wars*, *Star Bores*, nuts...."

Without warning, he felt something grabbing him, lifting him effortlessly into the air. The stench of alien sweat was strong.

"Human! You no read?! No humans here!"

Our hero turned to face the voice, and felt his intestines cringe. He was face to face with something that looked like a wookiee with a mohawk. And that breath!

"Listen, all I want is a lousy drink, and I'll be outta here faster than you can say

plutonium milkshake..."

"No, human will play *Grid Wars*, then if alive, will drink..."

"But..."

The next moment he was sitting in front of a large black table, facing another alien. Its breath was worse, and its complexion was like a greemite pizza. He glanced down and saw a beige keyboard with three keys, labeled laser cannon, torpedoes and a red key with the faded word "vaporizer." There was also a small box attached to a cord. A mouse?

"Human," croaked his opponent, "you will defend your position. I throw energy zingers, voltage pies, other nasties, you launch energizer spheres, try to destroy them. Energizer Spheres act like projectiles, they fly with parabolic motion. Mouse moves your sights back and forth horizontally. You point to place on grid you want shoot, hit mouse button. Keyboard for torpedoes and vaporizer."

Good thing I majored in ancient physics, thought the human.

"My photon field advances towards you. You constantly bombard it, or energy tendrils reach you, destroy you. Vaporizers destroy everything on the board. You get one vaporizer. You play good, you get more."



Thanks a lot, he thought.

"I get tired, you win, you play next guy. Fifteen of us waiting to play. You lose, we bury you in titanium tube. We have fun, yes?"

"I'd rather just get my drink and get going...."

The alien's eyebrow (or something) arched up high. "We play!"

Out of nowhere, an extraterrestrial pretty whispered in his ear. "Just do what he says. If you've played this type of game before, you know what will happen. Play it long enough, you'll get really good at it, and you'll both want to move on to something more interesting, maybe even fight over me...."

Our friend began to sweat. "But when do I win? What do I get if I beat you?"

A low titter went through the throng of creatures. "You find out!" was the last thing he heard, as an energy ball came flying out of nowhere....—DB

MACINOOGA CHOO-CHOO

List Price: \$39. Published by Fortnum Software, 31 W. Sierra Madre Blvd., Sierra Madre, CA 91024. (818) 355-7114.

TOY TRAINS, MODEL RAILROADS, AND COMPUTERS GO back a long way. Many of the early hackers met and worked at MIT's Tech Model Railroad Club. While they made significant advances in computing, they never did get the trains computerized—until very recently. Now *Macnooga Choo-Choo* really brings toy trains and computers together. That's because *Macnooga* is a true electronic train set.

The program comes with five layouts ready to run. The different layouts illustrate all of the program's features. Some have invisible track, others glory in their *MacPaint*-created scenery. All are fun to oper-

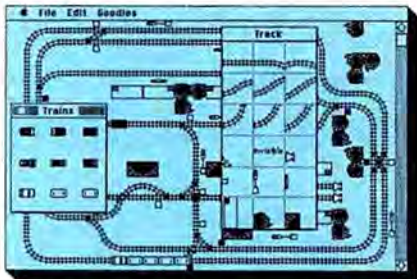
ate. Just beware of crashes, which lead to results unimaginable on the real thing.

The layouts provided are easy to modify using the wide range of tools available. Simple program-generated scenery can be added to *MacPaint*-created scenery that is already in place. Users can add signals, which will stop trains if they're set to, uncouplers, more locomotives and more cars. Several designs of each type are provided on a handy Train palette.

Once the layout is set, trains are set into motion with the mouse and all speed and directional control is accomplished with the mouse. Be careful when running trains, or you'll crash them! Crashes of electronic trains are rather different from crashes of electric trains (or programs, for that matter). Here crashed trains proceed on their rather merry way. They look and move as though they were drunk!

Empire builders can start from scratch and build up a reasonable layout. Just like real toy trains, the space available is limit-

ed, but ample for all but the most land-greedy. As in real life, it is better to lay your track after you do the scenery. Laying



multiple tracks is accomplished using the Burrow command which allows the builder to treat each element in the grid square separately.

About all that's missing is the electrical smell of warm motors and transformers and the ability to view your creation from anything other than a bird's-eye view.—SB

COPY II MAC

List Price: \$39.95. Published by Central Point Software, #100, 9700 SW Capitol Highway, Portland, OR 97219. (503) 244-5782. Version 4.5 reviewed, program is updated frequently.

COPY II MAC HAS MADE MORE BACKUP COPIES OF MAC software than any other program, so many



that its title is in danger of becoming a verb. Few Mac owners would misunderstand a sentence like "Copy II the disk before you even run it."

This notoriety is deserved. The program is simple, foolproof, crashproof, idiotproof and, most importantly, effective. User options are limited, which might seem to make this program less potent than competitors that let their bells and whistles hang out, but in this case it just means that the programmers have thought of almost everything and built it all right in. The few options are explained on a Help screen and in the manual.

Few users have any problems and no reports of *Copy II* crashing have ever gotten around. The program's only real flaw is that it defaults to its less reliable bit copy mode when launched, tricking some users into bit copying when they should first do a sector copy (it's really a block copy) first. *Copy II Mac*'s sector copier verifies as it works,

while its bit copier doesn't, so it is perfectly possible to introduce new errors when bit copying. If the clear manual is followed, all should work properly.

New versions of *Copy II Mac* are released at frequent intervals and registered owners get a chance to update for \$18. The updates are usually worth it, as each significantly increases the list of programs *Copy II Mac* can back up.

Also included on the disk are *MacTools* and *Copy II HD* (for Hard Disk). *MacTools* combines a good disk editor with excellent file management and recovery sections. Since it does far more than *Copy II Mac*, most of the manual is devoted to using it effectively. *MacTools* is invaluable when attempting to salvage lost or damaged files. It is the easiest to use of all the file recovery tools and makes the fewest technical demands on its users.

MacTools also provides simple ways to set a file's attribute bits (those are the

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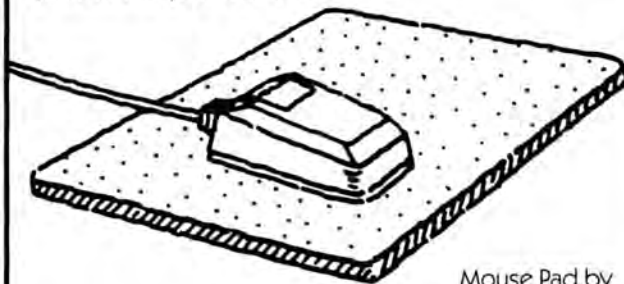
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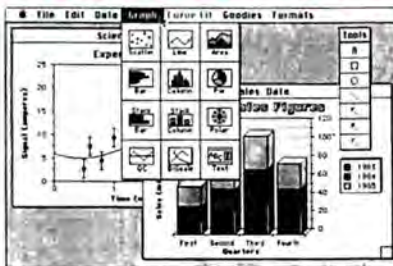
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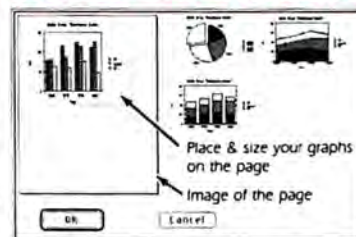
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Q U I C K C L I C K S

controls that cause files to be invisible, locked or protected). A file's type and creator field can also be changed.

Copy II HD copies selected applications to hard disks. It works on all unprotected

applications and a long list of copy-protected programs. The applications that it can copy are listed in a dialog box. Since its function is very limited, *Copy II HD* is extremely easy to use.

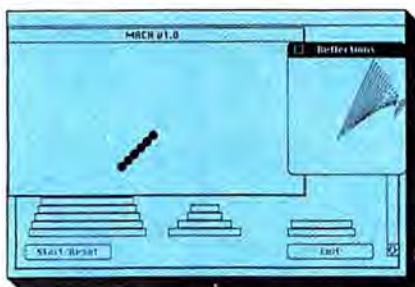
The disk that contains these programs is not copy protected. The first of your many *Copy II* backup copies should be itself. Take good care of it, since it's certain to be one of your most valuable tools.—SB

MACH 1.0

List price: \$99. Requires 512K. Second drive and printer recommended. Published by Palo Alto Shipping Co., PO Box 7430, Menlo Park, CA 94026. (800) 44-FORTH.

THE STRUCTURE OF FORTH MAKES IT DIFFERENT FROM other programming languages. Forth programs build on low-level functions to create larger words or commands that describe higher level tasks (thus extending the language). To decipher a Forth program requires reading it backwards from the bottom up. Forth has some characteristics of both an interpreter and a compiler.

One disadvantage of Forth is the lack of local variables, which complicates the passing of parameters between words. Most versions of Forth force users to edit program text in segments called screens



which are incompatible with normal word processors.

Mach 1 from Palo Alto Shipping Company is a multitasking implementation of Forth designed for the Macintosh. *Mach 1* has corrected the lack of local variables found in Forth-83, a standardized version upon which it is based, by adding named input parameters. It also has provided for the

loading of text-only files instead of blocks.

Mach 1 has libraries of predefined words to perform functions such as toolbox access, uniform input/output and floating point arithmetic. It also includes an MDS compatible assembler and symbolic debugger.

The speed of *Mach 1*'s code, although still slower than code written in C, is dramatically improved over other versions of Forth. And *Mach 1* is so easy to use that program development time can be much quicker than it might be in other high level languages. This is due in part to the nature of Forth. It is also because *Mach1* and the MDS editor can both run under *Switcher* so time isn't wasted jumping from one to the other. The list price and low licensing costs of *Mach 1* should make it an excellent choice for Forth programmers.—Gilbert Rankin

SPEED READER II

List Price: \$69.95. Published by Davidson & Associates, 3135 Kashiwa St., Torrance, CA 90505. (800) 556-6141 (outside CA), (213) 534-4010.

SPEED READER II IS A COMPLETE SELF-STUDY COURSE that utilizes a series of exercises to improve reading speed, comprehension and memory retention. The exercises build three specific skills—eye span, rate of perception and eye movement—gradually and in sequential steps.

Eye span exercises increase the range of text read at one pause by training the eye to use peripheral vision in reading. Starting with two letters and progressing to entire words, these exercises are used at the

beginning of a practice session. The next step involves reading a prepared selection in a narrow column of text, then gradually expanding the width of the column. Questions are asked at the end of each passage to evaluate comprehension.

Speed Reader II times your reading and prepares reports on both reading speed and comprehension. It also graphs the scores of any six exercises as an indication of progress. There are 35 selections on the *Speed Reader II* disk, all at high school reading level. Additional levels are available, from elementary through adult, on data disks. Each additional level costs \$19.95.

Speed Reader II is easy to use and well designed. There is virtually no need to use the keyboard, so you can concentrate fully on reading.

By following the course as outlined in the

book, it may be possible to increase reading speed as much as 200%, or perhaps more. Tests conducted by *MacUser* showed



significant improvement in reading speed (from 300 words per minute to just under 500) after one practice session.—MDW

CLICKART EFFECTS

List Price: \$49.95. Published by T/Maker Company, 2115 Landings Drive, Mountain View, CA 94034. (415) 962-0195.

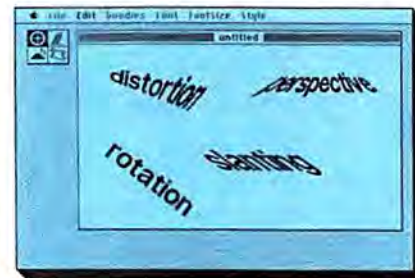
EVERY SERIOUS *MACPAINTER* MUST HAVE *CLICKART EFFECTS*. A desk accessory designed to be used within *MacPaint*, *ClickArt Effects* allows the user to rotate, stretch, slant or add a vanishing point to any graphic object.

Any image in the active *MacPaint* window can be modified with the four effects available. If the artist isn't satisfied with the effect achieved by a tool, the image may be

restored with the *UNDO* command. *UNDO* will only work on the last tool used.

Images modified with *ClickArt Effects* are still *MacPaint* elements and can be cut or copied and pasted into any application that supports the Clipboard.

ClickArt Effects installs itself into *Mac-*



Paint, not into the System Folder like most other desk accessories. If *MacPaint* is moved to another disk, *ClickArt Effects* moves with it, and will still appear under the desk accessory menu, even though it was not installed on the new disk.

Certain operations, such as rotate, produce images that are very "dirty," requiring extensive cleaning in *FlatBits*. This distortion effect is due to the resolution of the Mac screen, and is not *ClickArt Effects'* fault. There are tricks to minimize this effect: when working with shaded images, remove all shading (preferably in *FlatBits*), manipulate the image as desired, then refill the object with the original patterns.

MacPaint is one of the most popular programs around, and with *ClickArt Effects* under the apple, it's even better!—DB

S A T H E
V I N G

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BY STEVEN BOBKER

THE SOFTWARE STRIP

REVOLUTIONS ARE ODD THINGS. Sometimes they are sudden and violent. Sometimes you wake up to find they've already happened. And sometimes a revolution occurs without your being aware of it at all.

Examine a revolution; any revolution will do. All have a few things in common. They are all like fire. Certain ingredients are necessary. Remove one and there is no revolution. Revolutions must have a cause, good or bad. There must be weapons or tools. And someone or something must bring everything together at the right time.

Steve Wozniak started a revolution when he created the first mass-produced disk drive for microcomputers. The old way of doing things, using cassette tapes for data and program storage, just didn't cut the mustard. Sure cassette technology worked, but almost in spite of itself. It was slow and very inefficient. But it was all there was. People put up with it, though they wanted and needed something better. That "something better" was the random access disk technology then found only on larger, much more expensive computers. Woz took that technology and made it usable and affordable for micro users. It sparked a true revolution in data storage.

Today users are faced with some new problems. The first is data glut. There is too much data around. While some comes on disks, most of

it is printed (in newsletters and newspapers). To make the best and most efficient use of this data, it must be somehow converted into computer readable form. Manual data entry is a solution only if your resources are nearly infinite. Obtaining the material on a disk or via telecommunication to a disk is sometimes possible, but usually very expensive. There has to be a better way.

Even those who program have trouble getting their products to market. The economics of software publishing preclude simple efforts by individuals. The costs of disks, of duplication, of manuals, packaging and distribution all combine to require a substantial investment to bring a program to market. Many programs (although exactly how many no one can say) never see the light of day. And we're all losers for that. If only the costs were lower, the original outlay less.

Sure, there's Freeware or shareware or MacHonorWare or whatever you want to call it, but the number of Mac programmers who have made a decent return from it

can be counted on one hand. What is needed is something that might allow programmers to sell their work at low cost and small investment and yet make a profit. The words "low cost" and "small investment" are positively revolutionary in today's software publishing world.

A GLIMMER

A recently developed technology may help solve both problems, that of data glut and that of "cheap" software. Cauzin Systems has created a simple to use, easy to print method of putting data on paper. Its new Softstrip system is relatively inexpensive, both from the users' standpoint and from the creators' standpoint. The tiny black and white squares pack a lot of data into a small space, and the reader is capable of retrieving that data under all but the worst conditions.

Cauzin appears committed to making its technology easily and widely available. That only makes sense, for in true capitalistic spirit, the more systems sold and the more they are accepted, the higher Cauzin's profits will be!

All the elements for a revolution are in place. There is a problem or cause. In fact, there are several. And the weapons or tools are there. The Softstrips and their readers are not widely used yet, but they are there, ready and working. And Cauzin seems willing to lead us into a new era of data and program distribution. The revolution could be happening at this very moment.

WHAT YOU SEE

The Softstrip system is both simple and complex. The actual Softstrips are composed of black and white squares printed on paper. They are the data. Strips are read by a high-tech reading device connected to your computer. Reading a Softstrip results in data or a program on a disk. Let's look at the technical side of the system.

While the Softstrip system has a superficial similarity to bar code,

***A new technology
promises to make
software cheaper than
ever and easier
to obtain.***



THE SOFTWARE STRIP



The Reader is compact and easy to use and store.

there are two major differences. The first, and most important, is the data density. Bar codes typically get about 3K on a page, while Softstrips can pack just over 40K per page. The other difference is reading ease. Bar codes generally have to be manually scanned, a tedious job on all but the shortest files. Softstrips are read automatically. Users simply align a dot and a line on the paper with a hole and the edge of the reader (and both need be aligned only to a tolerance of 1/16th of an inch). Strips cannot be read out of order; any attempt to do so will be thwarted by the software.

Softstrips encode 8-bit ASCII data (common, ordinary everyday stuff; all Mac programs can be translated into this code) into machine-readable form. The resulting encoded data can be printed in low-, medium- or high-density strips. The density chosen depends both on the means used to generate the data strips and the quality of the ultimate printing process and paper.

Low-density strips can store up

500 bytes in a standard 9.5-inch strip, medium-density allows up to approximately 3400 bytes per strip and high-density contains about 5500 bytes per strip. Strips can be as short as 1 inch long or as long as 9.5 inches. Their width is determined by their density, with low-density strips being approximately 1/2 inch wide, medium-density 3/4 of an inch and high-density approximately 5/8 inch wide.

The data on paper is in the form of what Cauzin calls dibits. A dibit is two successive squares with a black followed by a white representing a zero and a white followed by a black is a one. Thus each byte consists of 16 black and white squares in a row.

Each line of data consists of either two, four or six bytes, depending on the density. As you would expect, the higher the density, the more bytes per line. Lines therefore contain either 32, 64 or 96 squares plus parity and marking information at the ends.

There's not much chance of misreading data. Error detection is pro-

vided by three separate techniques. First, there's a parity bit at each end of the data lines; one is used to check the parity of the odd bits, while the other is used for the even bits. Each line is also checksummed with either a normal 8-bit checksum or an optional 16-bit CRC (cyclic redundancy cycle) checksum. And finally, the mechanical scanning method effectively scans each up to four times and integrates the data to avoid problems caused by irregularities in the printing process.

The result of all this is an error rate that Cauzin claims is less than one bit in 10,000,000,000 bits. We had no read problems in any of the materials we tested, mutilated and retested. This system seems even more immune to error than standard electronic media such as disks.

The real heart of the system, at least as far as the end user is concerned, is the strip reader itself. This electro-mechanical device weighs a scant 20 ounces (not including its cast aluminum base), and is 16.6 inches long by 2.5 inches high by 3 inches wide. It is powered by a small external transformer and connects to the Mac's serial modem port.

The reader is manually positioned over each strip, aligning through a hole at one end and the reader edge at the other. The sensor scans in increments of 0.0025 inch and has an effective accuracy of 0.00001 inch. Since data lines are between 0.01 and 0.04 inches high, each line is scanned several times, each time in a slightly different location. The sensor's on-board circuitry integrates the density of each half of each dibit and decides whether each bit is a 0 or a 1 based on the multiple versions of the information it has obtained.

The actual reading of the data occurs when the sensor illuminates the data with near-infrared light. This light, which is generated by a light emitting diode (LED), heats (very slightly!) the carbon used in black ink and photocopier toner. The sensor then records the heat increase of the dark areas.

This method of reading has many advantages. Users can overwrite datastrips with colored inks or markers and the strips will still be readable.

The strips are also immune to such disk killers as spilled coffee or soda! Just dry the page out and read it.

On the other hand, writing across a strip with an ordinary pencil or printing the strip on colored paper will copy protect the data in the sense that the strip can no longer be photo- or xerox copied and used. Pencil writing contains carbon and so is readable by the sensor.

Photocopying colored papers usually alters the background toner (which contains carbon) level and, again, gives erroneous information to the sensor.

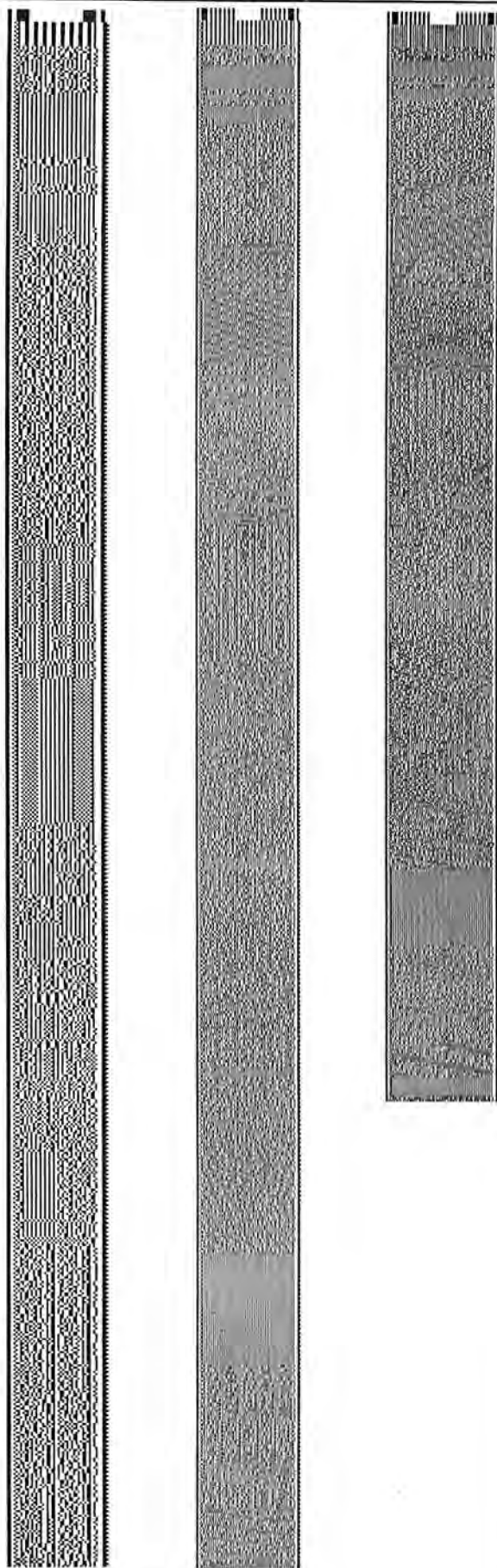
As the reader moves down the page it tracks its own lateral movement to within 5 microns. Its alignment is controlled by two separate servo mechanisms. These self-alignment features let the reader handle Softstrips that are not perfectly flat. It is possible to crumple a page containing Softstrips and then smooth it out and read the data successfully. More importantly, data in magazines can be read without any special preparation. The pages the data is on do not have to be removed and, while they should lie reasonably flat, the reader can handle normal page warps. This ability to correctly read under less than perfect conditions is a major strength of the system.

The optical portion of the scanning system consists of eight rotating cylindrical lenses and an aspherical corrector lens, forming an effective aperture of $f/12$. The system has a depth of field between 0.05 and 0.08 inches, allowing for warp in the scanned material. A set of 160 additional cylindrical lenses on the rotating cylinder allow the system to maintain very exact control of the scanning rate.

The mechanic elements are mostly plastics with the actual movement controlled by six high-precision molded plastic gears. The electronics consist of an ATMS 7040 8-bit microprocessor and a custom VLSI chip that contains the reader logic, control and communications using four nested phase-locked-loops and several hardware and software servos.

The equipment is as sturdy and

Softstrips. The strip on the left is a low-density strip, that in the middle is a medium-density strip and the right-hand strip is a high-density strip. All three strips show Mainstay Software's tumbling Mac demo. The whole program in low density is 2-1/2 strips long; in medium density it's one strip and a very short second strip; while the high-density version is complete. Try it!



THE SOFTWARE STRIP

robust as the strips. Some basic tests, such as dropping it on the floor repeatedly, failed to cause problems. Breaking it seems to require a determined effort.

The data that the reader collects is sent to the Mac in 4800-baud bursts, although the average data transfer or throughput rate is between 1000 and 1500 baud, depending on strip density and length. A full 9.5-inch, high-density strip takes about 30 seconds to read.

... IS WHAT YOU GET

The system, at least from the user's viewpoint, is both small and simple. Simply buy a reader, which lists for under \$200. Software and other data will be available in various printed forms.

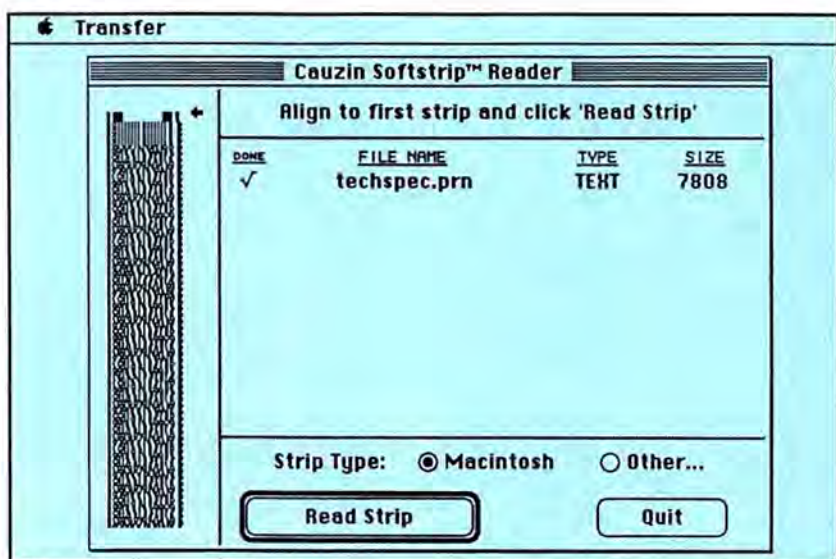
Where do you find this software and data? Right now, the sources are limited. There is a chicken and egg effect in progress. Publishers are reluctant to provide their software and data in Softstrip form since there aren't enough readers in users' hands "to make it worthwhile (or cost effective or whatever)." Reader sales have been slow because there's little

GETTING STARTED

Check your dealer first for a reader. Some dealers are starting to carry them. The list price is \$195. Be sure you get the Mac version of the software, as there are also versions for the Apple II and the IBM PC. The only difference in the readers is in the detachable cable that connects the reader to your computer. Given extra cables and proper software, you can use the reader with several different computers.

Program strips, of course, contain material that is computer specific. Data strips, on the other hand, should be in straight ASCII code, and thus able to be imported to different computers, just as Mac files of type TEXT can be sent to other machines.

If your dealer isn't carrying readers yet, contact Cauzin for the name and address of a dealer. They can be reached at 1-800-533-7323, or in Connecticut at 573-0150. They're located at 835 South Main St., Waterbury, CT 06706.



The Cauzin Softstrip Reader. The Transfer menu allows users to try out applications the Reader has put on disk.

to read. Why buy a reader to sit and gather dust? Cauzin is aggressively promoting the use of Softstrips and will do some publishing on its own. As more strips are published in ads and commercially, this problem should fade.

MacUser plans to provide our more extensive code listings in this form, starting in the next issue or two. Other Mac-oriented magazines (such as *Nibble Mac*) either are already doing that or will be doing that. And as soon as demand warrants we'll be providing our indexes and other data compendiums (possibly including our MiniFinders) in this new format.

Newsletters and magazines, particularly in the financial field, will soon be publishing their data in Softstrip as well as normal printed form. Financial data is an excellent candidate for Softstrips, since to be most useful, it must be massaged in analysis programs. That usually means tedious manual entry, with a large probability of a few errors (due to typos) creeping in. A Softstrip or two can save hours of work.

Apple is thinking of providing Mac System software updates in this format. As most certified developers know, the Software Supplements Apple has provided over the last year and a half have been on disks, over a hundred disks per developer. Some

of that material (particularly patches to existing programs and files) could be more easily provided in Softstrip form.

Other businesses can benefit from this technology. Banks, particularly smaller banks, can be more competitive by sending customers statements in Softstrip form. Having the data ready for entry in accounting programs will be a major convenience for customers, both in saving time and reducing errors. Other businesses that now send detailed statements can also provide data in this form.

That's a little bit in the future, however. Right now, users can't generate their own Softstrips. The Softstrip technology is proprietary to the Cauzin Systems and right now Cauzin is the source of all software strips. Cauzin will convert material of your choosing to Softstrips for a fee (\$20 per strip, \$50 minimum order). That's not practical for statements and other material where each recipient gets different data.

However, programs to generate Softstrips are under development and may be available by the time you read this. Current plans call for Mac software that has the ability to generate low-density Softstrips on the ImageWriter and medium-density Softstrips on the LaserWriter. High-density Softstrips will still require

service bureau production as they use a resolution finer than the 300 dots per inch that the LaserWriter can provide. The materials that Cauzin now produce on its in-house equipment are shipped in the form of photographic film negatives (positives are also available) so that maximum quality can be obtained in the printing process.

Most users will not generate their own strips, but will use Softstrips they find in magazines and newsletters. Sometimes the Softstrips will be part of a booklet consisting of a program and its manual. Cauzin plans to publish programs under the StripWare brand name. These programs will come complete with manual and cost between \$3 and \$13. These prices may be low, and they show that the overall production and publishing costs for software put on the market in this new format are much lower than in the more traditional marketing methods. This alone can open the market to much new software, much as occurred when the first Apple disk drives lowered the cost (and time involved) in producing many copies of programs. If the Softstrip System catches on, as it appears to be doing, we can expect an explosion of good, low-priced software.

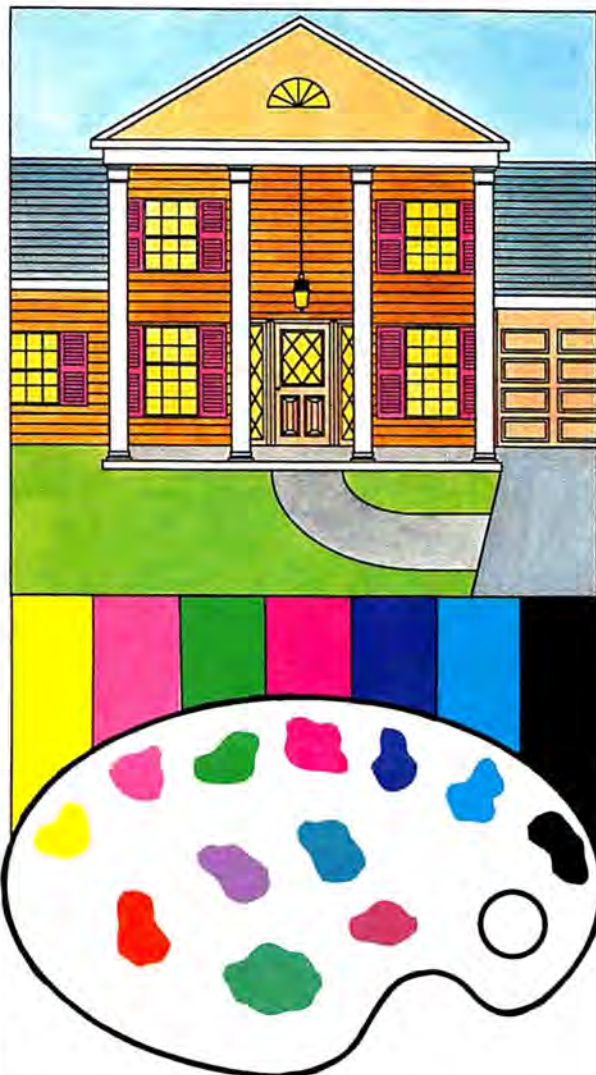
Softstrip technology offers more than cheap programs. That may be its major attraction for some users, but there is lots more it can do. The possibilities are nearly endless. Data archives can be created, stored and filed in traditional office ways (files in file cabinets). Backups no longer have to eat up expensive storage media. And backups of the backups are just a trip to the copier away.

Very large files can be created, although as a practical matter somewhere around 75K should be considered the maximum size. That's because it does take 30 seconds or so to read in each strip. A 75K file would be 14 or 15 high-density strips. Faster readers are under development and eventually file size should not be limited in any way.

Pergamon Press, a major publisher of scientific journals, has already started putting the table of contents

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A RELATIONAL BARGAIN

***Interlace is a powerful,
easy to use, fully
relational database.
For \$95. No kidding!***

POWER SOFTWARE COSTS A FORTUNE. That discovery is often a bitter pill for new computer users to swallow. But once that pill goes down, its message heads straight to the brain and takes root there. From that point on, it is difficult to imagine things being any other way. Development time and resources are costly, so software companies have to

charge exorbitant prices to recoup their investment. This thought, so painful at first, becomes a way of life. Then inexpensive software is sometimes viewed with skepticism and it's easy to overlook a real bargain.

Interlace is an incredible bargain. Developed by people originally involved with software development for the Lisa or similar projects at Xerox PARC and other Silicon Valley think tanks, *Interlace* is a database manager that is powerful and at the same time easy to use. It can manipulate numbers and text with most if not all of the functions normally found in industrial-strength spreadsheets; offers simple standard reports or complex custom reports; works with single or multiple files; and makes it easy to link information in one file with related data in another

file. *Interlace* is good, it is true to the philosophy and operation of the Mac interface and it sells for \$95. No joke—\$95.

DESIGNER DATABASE

Interlace opens with a big, empty window called the DataBase Overview. The Overview window displays the files created or opened in each session, and is always there as a reference. This can be valuable when working with multiple files (up to 15 files can be open at a time), because it is easy to get confused about where things are located. A Windows menu lists all the windows open at any time. Clicking on the name of a window brings it to the top of the pile.

Creating a new file is as simple as

by Michael D. Wesley

A RELATIONAL BARGAIN

selecting NEW DATABASE FILE... from the File menu. Once the file is named and saved to disk, a small window appears in the Overview window with the name of the new file in the title bar. A blank space is provided for the first field, and is already selected. To build the file, simply type in the name of each field and press the RETURN key. The file window grows to accommodate the number of fields, up to 254 fields per record.

An X appears in the Close box in the file window's title bar. This means that the design must be saved before any data can be entered.

KEEPING THE BOOKS

As an example of a simple file, a small children's bookstore wants to

keep track of all the books it carries. The Book file needs to contain the following information: title, author, publisher, supplier (in the case of books that can be purchased from a local distributor as well as the publisher), price, and discount (the difference between what the bookstore pays and the retail price). Each of these pieces of data is a field. The Book file is created by typing each of these field names in the file window.

Interlace fields can contain a variety of information, including text, numbers, dates or times. The options are listed in the Describe menu. The default setting is text, because a text field can contain any type of data. The text setting is fine for most of the fields in the Book database, but what if you want to search for all

the books with prices less than \$10? If the price information is entered as text, the search is cumbersome, but if a field contains a number, *Interlace* searches for a particular value quickly and efficiently. That means the price and discount fields should be set as Number fields.

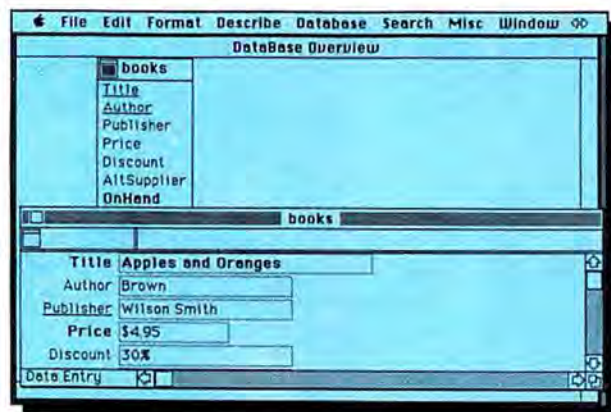
By choosing DISPLAY FORMAT... from the Format menu, the price field can be assigned a dollar format and told to display two decimal places. Then, when you are entering data for a book with a price of \$6.00, all you have to enter is the numeral 6. *Interlace* will format it automatically to display as a dollar amount.

To make it easier for *Interlace* to be able to find a specific book, each record or complete listing must be unique, so one or more of the fields must be identified as key fields. Using the bookstore example, there may be more than one book in stock with the same title, but there probably won't be two books with the same title *and* author, so each book record can be uniquely identified by making both Title and Author key fields. With *Interlace*, this is done by selecting the field in question and choosing KEY FIELD from the Describe menu. The field label is now underlined in the file window, indicating that it is a key field. A file must have at least one key field.

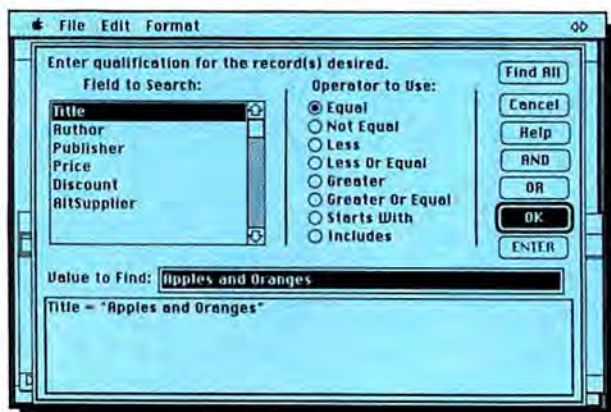
The order in which field names are listed in the file window is carried over to data entry, and is used to determine sort priorities. Field names can be moved up or down in the file window list simply by picking them up and dropping them in a new spot. If a field name is moved directly between two key fields, it automatically becomes a key field and has sort priority over the field below it.

ON THE RECORD

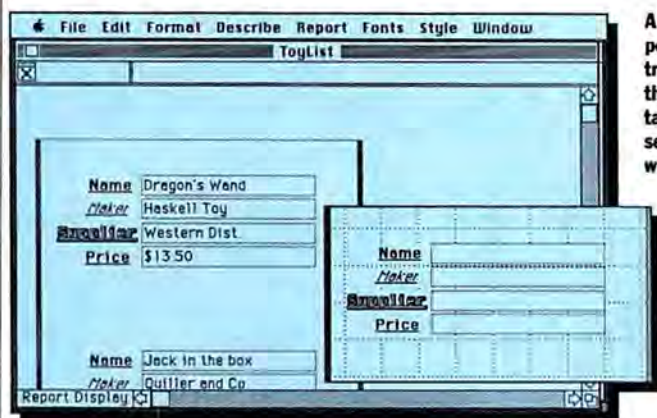
Once the file is built and the design has been saved, the next step is to begin entering data. Double-clicking in the title bar of the file window brings the data entry window to the screen with a blank record ready to be filled in. The field names appear as labels in the same order as they are listed in the file



A sample record in the Book file, with the Overview window behind it. The title was formatted for boldface when the data entry window was designed.



The Querybuilder dialog box. Searching for a record is as easy as clicking and typing in a value.



A sample table-style report, redesigned so entries list vertically rather than the default horizontal arrangement. The inset shows how the report was designed.

window, with an empty box beside each to hold the data. To enter the name of a book, simply click on the field box next to Name and begin typing. Move from one field to the next by pressing either TAB or RETURN after each entry. The record is complete when all the fields are filled, but it can be entered into the database with any number of boxes empty, as long as at least one of the key fields contains data. The remaining fields can be filled in, or the record changed, at any time.

In many databases it is difficult or impossible to change a file's design. The position and size of the field boxes are set to default values by *Interlace*, but they can be easily changed. Elements of *Interlace* files can be moved around, deleted or their contents altered at virtually any time, whether a file is brand new or already contains data.

Selecting FORM LAYOUT from the Database menu gives you full control over the look of the data entry form. The form is placed against a grid background and several new menus become available. In the Book file example, the Title and Author entries need to be larger than the price and discount, for example. In the form layout mode, the Title entry box can be made larger, or the Price box smaller, simply by selecting it and dragging the lower right hand corner until the box matches the desired dimensions. The field boxes can be picked up and moved to any position on the page. Holding the SHIFT key down while select-

ing several objects makes it possible to treat them as a single unit.

Interlace also provides control over the font and style of labels and fields. For instance, all the titles in the Book file can be made to appear in bold type simply by clicking on the Title field box and choosing BOLD from the Style menu.

When the form layout looks just right, selecting DATA ENTRY from the Layout menu returns the data entry window with all the cosmetic changes recorded. All necessary data is then entered for each book in stock. As a record is completed, it can be entered in the file by selecting ENTER RECORD from the Database menu, or pressing COMMAND-W. A new, blank record is brought on-screen by selecting NEW RECORD or pressing COMMAND-E. (Nearly all of *Interlace*'s menu selections have a command key option.) If several records are going to be entered in one sitting, pressing the ENTER key on the Mac keyboard saves a step. This enters the record, puts it away, and displays a blank record.

To delete a record while the file is being built or at a later time, simply select DELETE RECORD from the Database menu, but use this option cautiously. One of the drawbacks of *Interlace* is that there is no warning dialog box when a single record is deleted, nor can you undo DELETE. A record deleted accidentally (easy enough to do because DELETE RECORD lies just below NEW RECORD in the Database menu) will have to be retyped. This is a bit surprising,

because in all other areas, *Interlace* is careful to prevent accidents.

The number of records, or listings, a file can contain is limited only by disk space, but all the records in a single file, such as the Book file, must be on a single disk (or volume on a hard disk). Individual files within a multiple file database can spread across more than one disk.

The database can be browsed record by record by selecting either FIRST, LAST, PRIOR or NEXT RECORD from the Search menu or pressing the appropriate command key combination. Some database programs display records in the order they were entered. *Interlace* automatically does a sort on the key fields and displays the records in ascending (A to Z or 1,2,3...) order. In the Book file, the records will be displayed alphabetically by title.

Using a very simple dialog box called Querybuild, *Interlace* can also search for a record on any field and according to a variety of logical operators. To find the record for a book called *David and the Wizard* click on TITLE in the list of fields presented in a MiniFinder-style window, select EQUAL from the list of operators and type the full title. You could also find this book and similar titles by clicking the title, selecting INCLUDES or STARTS WITH, and typing any part of the title.

Press ENTER to accept a search qualification and OK to display the desired record. When the record is shown, the formula *Interlace* used to find it is displayed in a formula bar above the record, for example STARTS(Title, David). The advantage in using *Interlace* is that this formula is built by pointing and clicking on a list of options, rather than requiring the user to know the program's syntax for formulas.

DISPLAYING DATA

Interlace has a simple built-in report format called a table-style report. A new report is created from the File menu. A dialog box asks you to choose between a table report and a custom report you build yourself. Selecting the table-style report brings up a dialog box similar to the one used to transfer fonts and desk

A RELATIONAL BARGAIN

accessories in *Font/DA Mover*.

A list of all fields appears in a window on the left side of the box, with a blank window on the right. To include a field in the report, select it and press the INCLUDE button. *Interlace* automatically drops to the next field name in the list and you continue selecting the fields to be incorporated into the new report. Alternatively, you can have all the fields displayed in the report by clicking on the INCLUDE ALL button.

Next, use the Querybuild dialog box to qualify the records. The report can perform a search on the database and list any or all of the records, as specified in Querybuild. Save the report and a report window comes up on the screen.

The report is initially displayed in design mode, with blank field boxes against a grid background. In this way, the size, shape, and position of the field boxes can be adjusted. The

default display shows all the assigned fields in a row across the page, with labels above each field. The grouping of boxes has a thick gray bar along the left edge indicating that it is a Repeating Collection. The Repeating Collection is *Interlace's* way of indicating that a particular field or group of fields repeats for every record. Because of the design setup in Querybuild, *Interlace* assumes that each of the assigned fields will be displayed for every record.

The fields can be moved into another design, such as a vertical grouping, by picking them up and dropping them in their new location. Doing this disturbs the Repeating Collection, so *Interlace* pulls the first record from the database and displays data in the fields moved out of the Repeating Collection. This is not a time for panic, but it is a bit confusing at first. Ignore the offending data and finish placing all the fields in the design you want. Then

use the crosshair cursor to draw a large box around the entire collection. Select REPEATING COLLECTION from the Describe menu. The fields are now surrounded by a gray box, and are once again empty of data.

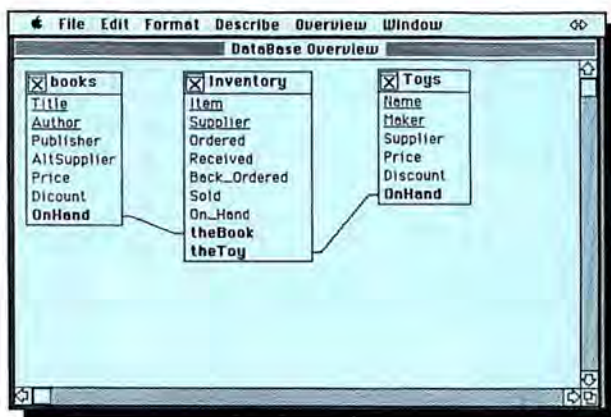
As with the data entry window, the report design window allows you to modify the font or style of any field or label. You can make the labels in different styles for variety or to set them apart, then save the new design. Choose DISPLAY from the Report menu and the report appears on-screen. The reports print out just as they appear on the screen, either on the ImageWriter or LaserWriter. *Interlace* can also place graphics into data entry or report forms. The flexibility of reporting opens up a wide range of possibilities, including forms generation and mail merge.

Custom reports are created from scratch on a blank page with a grid background. Each field is drawn and given a type such as text or number, then placed where it belongs on the grid. Unlike the table-style report, the field has no specific reference to a file or a field. This must be built by selecting a file from a list in a minifinder window, then using Querybuilder to specify the field and search qualifications. For the report to display all of the records selected by the query, the group of fields must again be made a Repeating Collection.

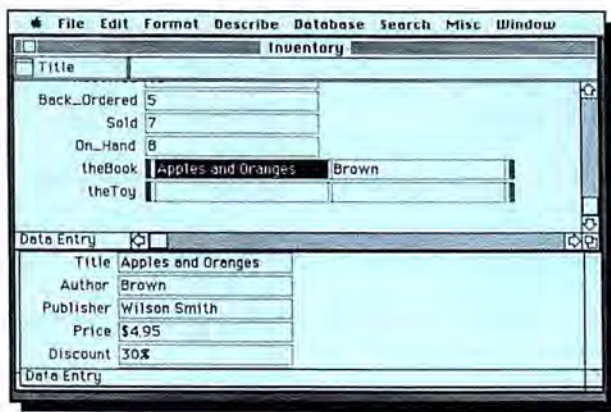
Sometimes, a report has to display information for some records but not all of them, as it does when the primary supplier of a book is someone other than the publisher. The fields in question can be formatted for Variable Height, and told not to display if there is no entry for a particular record. The Variable Height option can also be used when a field needs to contain several lines of data.

CAN YOU RELATE?

Although building a single file database like the Book file is very easy with *Interlace*, the true strength of the program is revealed in its ability to link multiple files. Say that the children's bookstore expands to carry a line of toys, and wants to



Files are linked simply by drawing a line from one to the other. Linked field names are automatically emboldened. Underlined fields are key fields.



Selecting the title field in an Inventory file record and pressing Command-G automatically brings the related Book entry to the screen.

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keep track of all books, toys and total inventory. A Toy file can be built along the same lines as the Book file, and a third database built for Inventory.

While looking through the book or toy file, it might be valuable to know exactly how many copies are on hand. With a non-relational database, you would have to open the Inventory file and do a search to find the record you wanted to see. A relational database, which is in itself a programming language, establishes active links between files. In many relational programs, the links are complicated to set up and manipulate, requiring a thorough knowledge of the program's language structure. With *Interlace*, linking files is wondrously simple.

To establish a link between the Book and Inventory files, both file windows must be showing on the DataBase Overview Window, but no documents should be open. If the Close box in the title bar of either file is shaded, a document is open and must be closed before the design of either file can be changed.

The link has to be established between two new fields at the time the fields are created. Select the last field in the Book file window and press RETURN. This creates space for a new field name. The *Interlace* manual recommends that the linked field name should reflect the name or purpose of the linked file, so our example is OnHand, indicating the number of Books in stock. A similar fieldname, theBook, is entered in the Inventory file window. The link between the two fields is made simply by drawing a line from one fieldname to the other, as in *MacProject*.

In the case of the Book and Inventory files, the link is from one record, that of a single book, to one other record, its inventory counterpart. Once the link is drawn, use a choice in the Describe menu to tell *Interlace* that it is a single link to one record. *Interlace* can also establish a collection of links from one record to many, for example a link from a list of suppliers to all the books they supplied, or from many records to many, depending on the nature of the link. The way to determine the

correct type of link is described very clearly in the *Interlace* manual. A similar link can be established between the Inventory and Toy files, using fields OnHand and the Toy, for example.

When any of the three files is displayed, the new linked field appears, with field entry boxes that match the key fields in the related file. In the Inventory record for the book *David and the Wizard*, the fields for the Book entry represent the title and author of the book, respectively. Enter these items in the correct fields. Then select SHOW LINKED RECORDS from the DataBase menu or type COMMAND-G and the related file in the Book file will be displayed. If the related file has not been opened yet, *Interlace* opens the file, finds the appropriate record, and displays it, all automatically. It would have been nice if the related record could be pulled up by double-clicking on the link, but you get accustomed to using COMMAND-G after a while.

COUNT ME IN

The ease of generating linked files alone is enough to consider *Interlace* a bargain, and not just because of its price. The potential time savings is remarkable. But *Interlace* hasn't finished astonishing us yet. It also includes a full range of spreadsheet-type logical, mathematical, and statistical functions (SUM, COUNT, MIN, AVERAGE, SIN, COS, TRUE, FALSE, etc.). These functions can be used to make *Interlace* a freeform spreadsheet, or to create complex and powerful reports.

For example, the book and toy store could generate a custom report that acted as a point-of-sale receipt generator. The report would accept the name of each item sold, pull the price from the Book or Toy file, calculate the sale, compute sales tax, calculate a total, print a receipt, and update the inventory.

Interlace can also port data in or out from the Clipboard, as a text file, or in mail merge format. Text from the Clipboard or text file must be formatted in a specific manner that's well outlined in the manual.

Interlace is fully Switcher-compati-

ble. It requires a whopping 300K configuration to work properly but there is enough space left to work comfortably with another program that requires only 128K.

LACING UP

Although *Interlace* is very easy to use, some of its operations can be confusing at first, like building a custom report for the first time, or using the spreadsheet functions if you are not adept at spreadsheets. The manual opens with a good tutorial that covers major operations, but its structure is a bit unusual, with a section after the tutorial called Details and Techniques, then a detailed reference section. There is very little explanation on the use of the spreadsheet functions. The index is weak and it is often difficult to find the answer to a specific question, although there is an excellent context-sensitive on-screen help facility.

All in all, *Interlace* is a special find. It is well designed and the execution is excellent. It is a relational database that can be used quickly and easily even by someone who has never heard of a relational database. It is a good buy for its quality, not just its price. ☐

INTERLACE: REPORT CARD

Overall Rating: ●●●●

Follows Mac Interface:	●●●●●
Printed Documentation:	●●●
On-Screen Help:	●●●●
Performance:	●●●●
Support:	●●●
Consumer Value:	●●●●●

Comments: Powerful, easy to use relational database that shows just how much the Mac can do.

Best Feature: Simple creation of files and links between files.

Worst Features: Cannot undo when you delete a record, somewhat weak manual.

List Price: \$129 retail, \$95 if you order direct. Requires 512K. Second drive or hard drive strongly recommended. Published by Singular Software, 5888 Castano Drive, San Jose, CA 95129. (408) 446-0207.

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by Joost Romeu

"THANKS, I REALLY NEEDED THAT!"

Sometimes it's a splash of cold water, sometimes it's a kick in the pants and sometimes it's a new way of looking at a vexing problem. At one time or another, all of us have required that push, that help to get started. Now there's a program that uses simple artificial intelligence (AI) techniques to help start the creative juices. *ods/Consultant* is a problem-solving program that can stimulate new ideas. It was designed to provoke creative as well as critical think-

ing faculties, and after accomplishing those feats, it then helps refine the solutions to a problem so they can be easily and effectively presented to others. That's a lot for any program to claim. Yet many people feel that *Consultant* does exactly what it claims to do.

Another large segment of the user community says that while the program does all that, that's nothing beyond the way they ordinarily behave. So why bother with a relatively expensive bit of software? If some

inspiration is needed, a fill-in-the-blanks book will do just as well. These people will not get much from *Consultant* and should probably ignore it.

Others will find it to be exactly what they need to focus on a problem—the perfect kick in the pants they need. Some people even react better to things they perceive as advanced, high-tech or computerized. Subconsciously they feel that this "thing," this computerized high-tech "thing," must know better. And

BETTER THAN ONE ?



ARE TWO HEADS BETTER THAN ONE?

in some cases, *Consultant* does know better. Its low-level AI routines can focus your thoughts faster, and often better, than you can.

In the end, whether *Consultant* will work for you comes down to your personality. Look carefully at yourself and at the program before committing yourself to it. Do you often need that little push? Could your ideas stand some focus, some improvement in aim? Or does that sort of help hinder and even offend you?

CALLING IN THE CONSULTANT

Most people tend to confront problems from a single direction. But using only one avenue—the approach usually found most successful, comfortable, or obvious—it is easy to overlook a better (more elegant, more efficient, less expensive) solution. *Consultant* lets users approach a problem from a number of vantage points and uncover unique and valuable insights.

Consultant starts by asking users to narrow down the pertinent facts or evaluate preconceptions. That alone may clarify a poorly defined problem. Then its idea generating and decision-making aids are used to expand or compress conceptual flights of fancy and provide sometimes unexpected insights.

Let's see how *Consultant* could be used to help solve a particular problem. Assume that you have just been assigned to head a computer graphics group in your company. The group has a recent history of problems and low productivity. A lot of time and energy is being wasted, because under existing conditions staff members can't generate graphics efficiently, communicate new ideas effectively or share graphic data easily with one another. Your job is to straighten the mess out, and how you go about it is up to you. You need a solution to a very complex problem, and you need it fast. You turn to *Consultant* to help attack the problem.

Consultant starts by forcing the creation of an assignment list that lists your responsibilities. For example, you might enter that you establish policies and procedures, supervise graphic production, manage a

Begin

- Register Personal Data
- Determine Mission
- Identify Assignments
- Prioritize Assignments
- Describe Assignment
- Choose Procedure

Detect

- Describe Problem
- Gather Candidate Facts
- Assess Relevancy and Validity
- Organize Facts
- Develop Explanations
- Test Explanations
- Identify Solution

Discover

- State Hypothesis
- Gather Candidate Facts
- Assess Relevancy and Validity
- Refine Hypothesis
- Design Experiment
- Conduct Experiment
- Interpret Evidence
- Develop Principle

Create

- Gather Candidate Facts
- Determine Objectives
- Assess Relevancy and Validity
- Identify Obstacles
- Inventory Resources
- Generate Ideas
- Edit and Translate Ideas
- Make Decisions
- Test Decisions

These are the menus you'll use first. Always start a work session at the Begin menu. Then use one of the next three menus to start solving your problem.

team of 12 people and report to the general manager.

When the assignment list is complete, *Consultant* reprints it and asks you to use its PRIORITIZER decision-making aid to determine the best order to tackle your assignments. PRIORITIZER takes the list and presents you with item-pairs from which you choose the item with the higher priority. Although some items may seem equally important,

the forced-choice method helps clarify responsibilities and puts them in perspective.

After completing the paired decisions, *Consultant* rearranges the items into a new "prioritized" list. With the assignments preferentially sorted, it's time to dig into the main issue.

The most important assignment should be worked on first. The program asks you to describe it. In this case, you are to organize a computer graphics facility that will maintain an up-to-date computer graphics operation and provide users with the ability to share graphic images.

You have now determined a problem, situated it within the context of your responsibilities, and described it. This problem should be smaller and easier to work on. That may be enough of a kick for you to simply go on and solve the problem yourself. Once the smaller problem is solved, go back to the *Consultant* to get the next piece of the overall problem. Keep doing that until the entire problem is solved.

But what if the smaller problem is still too complex, too hard to get a handle on? Just move to *Consultant's* next level of problem-solving assistance. You'll have to choose a procedure from *Consultant's* three options.

The DETECT option asks you to look back and describe the problem by gathering relevant facts, assessing them and organizing them. Based on a review of that assessment, you can develop and test explanations and identify plausible solutions.

A second approach, DISCOVER, uses the scientific method to help uncover the basic principles behind a hypothetical problem solution. After evaluating your problem, you pose a hypothesis. *Consultant* then instructs you to compile evidence and design and conduct an experiment to test your initial premise.

The third option, CREATE, looks toward the future. You'll be asked to state the problem in terms of how it relates to your objectives, recognize the resources you have available and, based on these determinations, generate, edit and test your decisions.

Your choice of procedure should

be based as much on your personality as anything else. Do you hate experiments, or is research a weak point? If that's so, then CREATE will probably be your preferred option. Here's how CREATE works.

The first step is to gather the pertinent facts (*Consultant* calls them Candidate Facts). Then determine your objective(s); what do you want to happen? Your role in the solution is often suggested by the data you just collected.

Next, *Consultant* suggests using the RATER decision-making aid to assess the relevancy and validity of your facts. RATER wants two independent criteria (for example, "usefulness" and "economy"). Then it asks you to rate each item on your list of facts on a 1 to 10 scale relative to these criteria. Many items are often closely clustered at the top of the list. However, *Consultant* takes small rating variations into account and reorders the list. The list can be considered a plan of action. Work down it to solve this particular portion of the problem. But if you've come this far, let *Consultant* take you a bit further.

The next step is to identify the obstacles that must be overcome before you can reach your objective.

There are often many objections to overcome when presenting an ambitious idea—in this case, they might include a boss' inability to appreciate the role of the computer or an inability to work with its limitations, an unwillingness to invest in the idea, or whatever. Objections reflect valid concerns that must be taken into account before attempting to sell an idea.

Take the time to inventory your resources. *Consultant* helps by reprinting the obstacle list and asking "What resources can be employed to overcome obstacles and reach the stated objectives?" This list will make more solutions obvious or even inevitable.

OTHER PROBLEMS, OTHER SOLUTIONS

Perhaps the most crucial aspect of critical thinking is brainstorming, generating many ideas very quickly and nonjudgmentally. At this point it may be time to turn to *Consul-*

Sell

Designate Prospect
Set Goals
Prospect's Needs
Select Aids
Get Appointment

Arouse Interest
Describe Conditions
Name Plan
Describe Objectives
Explain Features
Explain Costs
Handle Objections
Cause Acceptance

Evaluate Presentation
Follow-up

Plan

Identify Goals
Establish Objectives
Determine Units
Quantify Objectives
Assign Time Limits

Identify Tasks
Identify Interdependencies
Assign People
Identify Milestones

List Resources
Quantify Resources
Determine Costs
Determine Benefits
Test Plan

Work

Monitor Plan
Modify Plan
Measure Results
Measure \$

Plan Next Session
Evaluate Performance
Contract Improvement

Scratchpad 1
Scratchpad 2
Scratchpad 3
Scratchpad 4

Once a solution has been identified, use these menus to prepare the presentations and proposals you'll need to sell your solution to others.

tant's BRAINSTORMER feature, which can take the place of a whole group of people. After entering a "stimulus question" ("How is this idea fiscally reasonable?"), you are instructed to suspend judgment and input anything that comes to mind. That means coming back to the problem at any time to continue the process or letting ideas flood all at once.

Consultant offers other tools to help the flow of ideas. QUESTIONER poses questions based on data you have input, the COMBINER forces you to relate your facts to each other (often generating new ideas), and the SCENARIO tool helps you create simple models.

The ideas you generate are most valuable when they lead to a specific action. *Consultant* will often reprint the original mission you entered when you started the work session. It then asks you to rephrase your intentions as "action terms." All ideas generated should then be looked at in light of the action terms. This will generate new ideas, and maybe even more solutions.

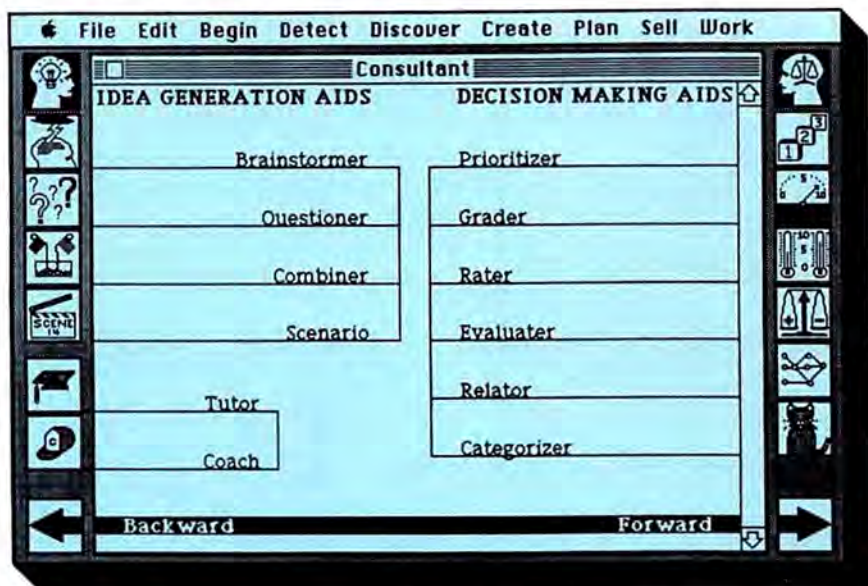
USING THE SOLUTION

Solutions are simply plans of action until they are implemented. *Consultant* provides a plethora of tools to help you sell and implement your solution.

The options on the Plan menu ask you to identify goals and specify objectives by quantifying goals and giving them a time limitation. You should also tell the program what you think are your tasks (and their interdependencies), resources, probable costs and hoped-for benefits.

The interdependency question is often particularly instructive. *Consultant* has you take the list of tasks and, using the RELATOR decision-making aid, determine their relationships. RELATOR presents the tasks as item-pairs and asks you to specify if an item is dependent on another. After going through all the item-pairs *Consultant* reorders the list (A, B, C,...) and displays the results—[A depends on: C]; [B depends on: A];...[G depends on: D, B], and so on. Through the use of these tools it is possible to construct a clear plan

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The work screen is ringed with icons. That lets you access any tool at any time.

of action relating to the original objective. Now's the time to devise a way to sell the plan.

Proceed to the Sell menu. First, you'll be asked to specify the people to whom the plan will be presented, and identify as much as possible their needs, goals, and so on. You can call on the SCENARIO decision-making aid for help. SCENARIO asks you to input a Title and Tone (your point of view). Then it asks you to specify the Players and their Roles and any props necessary to the story. Finally, it suggests a scenario. If this scenario doesn't seem to work, go back and change the Tone to reflect your boss' point of view and retell the story. This may help you realize the pressures the bosses are operating under; the deadlines that must be met and standards that must be upheld. With this knowledge, you

may be able to present the idea more convincingly.

Consultant suggests appropriate graphic aids (perhaps some *MacProject* flowcharts, examples of Mac graphics to demonstrate the stylistic diversity available with a Macintosh, etc.), interest generating devices (a Macintosh slide show?), relevant background material, and other psychological stimuli.

Finally, *Consultant* can print a report containing all the material generated in the work session. Armed with this report, users can prepare effective presentations and proposals.

WHY BOTHER?

Creative problem solving is not a mere phenomenon where the inscrutable minds of the exceptional individuals work in random ways. Every-

one is capable of creative thinking. *Consultant's* idea generation aids are list creation and manipulation techniques designed to help all problem solvers use their creative potential.

Critical thoughts compliment creative ideation. It is important to suspend your critical faculties in generating ideas, and it is eventually necessary to choose wisely from among the possibilities, coalescing simple ruminations into reality. Although critical thinking is a skill we all exercise, it can be refined. *Consultant's* decision-making aids reflect some very useful sorting algorithms that make it easier to understand and prioritize ideas.

PROGRAMMATIC DETAILS

Consultant makes excellent use of the Macintosh interface. Context-sensitive on-screen help is always available. These help screens are called either Tutors or Coaches, depending both on where you are in the program and what sort of help you require. On-screen icons are used to access them. The documentation is clear, and learning the program is a speedy, painless process.

Report generation is adequate, but the reports would be more interesting if they could use graphics and fonts other than their default fonts. Some of the format, which isn't user definable, is inappropriate. For example, it would be much more useful to see the results of the RELATOR tool displayed as a flowchart rather than as the bracketed list supplied.

Consultant does offer four "Scratchpads." A Scratchpad is a Note Pad-like file upon which users enter (via the keyboard or by cutting and pasting) lists, which can then be worked on using the various idea generation and decision-making aids.

Unlike most programs that non-judgmentally catalogue information, *Consultant* encourages the user to hone in on specifics. With it users can confront the trees without losing sight of the forest.

Problem solving should not be a chore. It should exercise minds and challenge abilities. *Consultant* will not answer your questions. But it can inspire you to make the most of your problem-solving capabilities. □

CONSULTANT: REPORT CARD

Overall Rating: ...

Follows Mac Interface:
Printed Documentation:
On-Screen Help:
Performance: ...
Support: ..
Consumer Value: ..
Comments: Incorporates simple AI techniques to stimulate and support critical thinking.
Best Feature: Provides easy-to-

use problem-solving direction, with a wide variety of tools.
Worst Feature: Doesn't delve deeply enough into the problem-solving process for some users.
List Price: \$200.
Published by Organizational Development Software, Inc., Suite 535, 1011 E. Touhy Ave., Des Plaines, IL 60018. (312)699-4156.

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JAPANESE TO GO

**All the Japanese you
can type—on the Mac!**

THE JAPANESE LOVE THE MACINTOSH. Given the love affair that Westerners have developed in recent years with sushi and samurai movies, that seems a fair exchange. The only problem is, the Japanese aren't buying Macs—not in any great numbers, at least.

The reason is the language. Simply put, the Japanese talk Japanese and the Mac doesn't. Or at least it didn't until quite recently. A Japanese company called ErgoSoft is trying to change that and come to Apple's rescue in the Land of the Rising Sun. Their products tell the tale of a technological revolution.

Until 6 years ago, word processing was an unknown concept in Japan. Even the idea of a Japanese typewriter was unknown. The reason is the complexity of the Japanese language. It is only with the advent of the microprocessor and recent advances in the software sciences that the Japanese have become able, on a personal basis, to access their own language in any sort of automated form. The effect this is having in Japan is revolutionary, and any micros that can't handle the language are out of the running. For a long while, that's where the Mac stood—out of the running.

Enter ErgoSoft. The company offers two products that allow the Japanese to use their own language in conversing with the Mac. This is a first for Macintosh, and a necessity if the Mac is to survive in the tough Japanese marketplace. One of the two products, *EgWord*, is a word processor that bears a resemblance to *MacWrite*. The other, *EgBridge*, extends the Japanese text-entry capabilities of *EgWord* to major applications such as *MacPaint*, *MacDraw*, and the entire Microsoft software family. The names of the products, by the way, sound much better in the original Japanese, where they are pronounced more like "EzWord" and "EzBridge"; their rather curious rendering in English is an unfortunate consequence of transliteration.

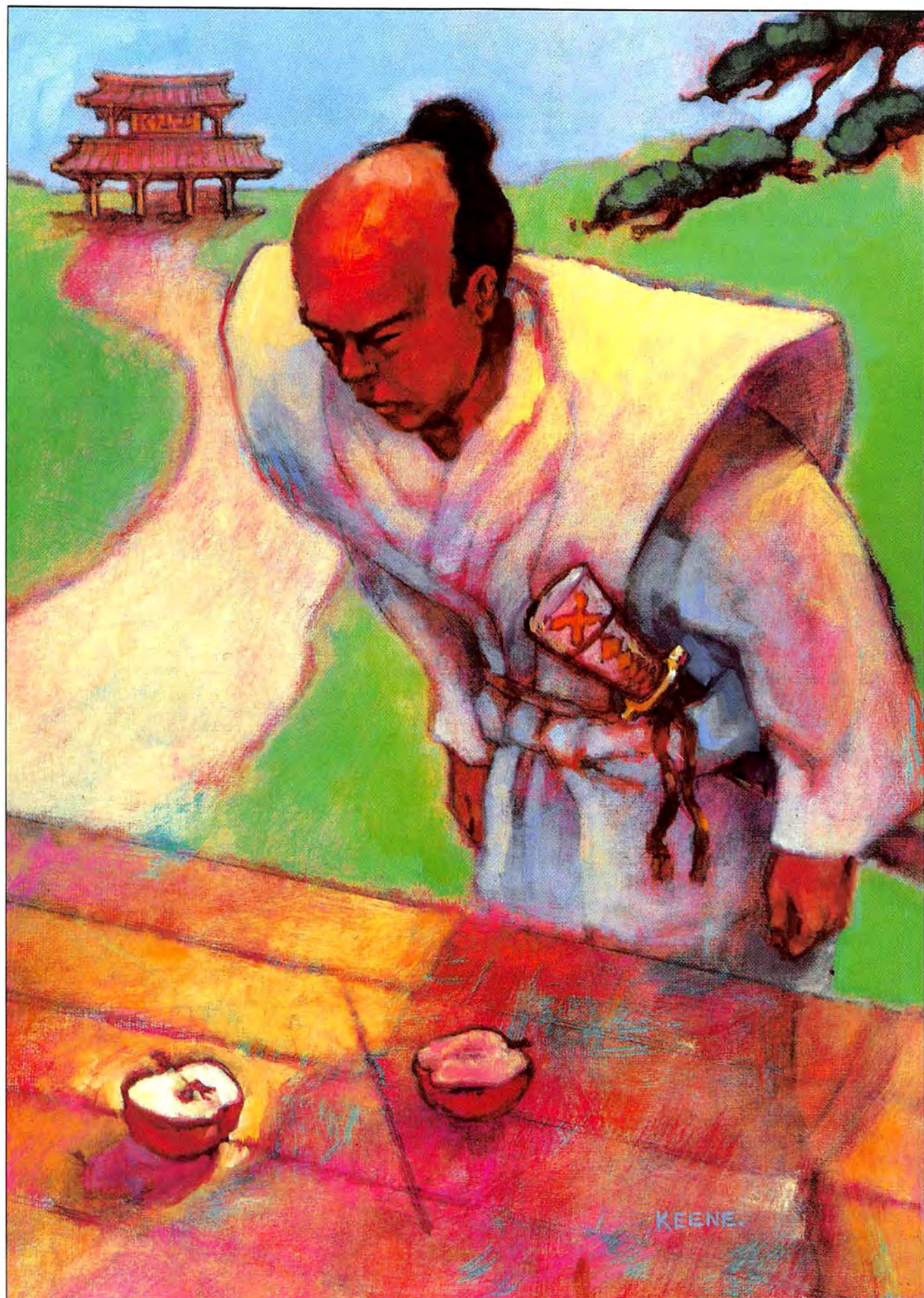
So what's the big deal about a Japanese *Word* or *MacWrite*? Japanese has the world's most complex writing system, and it takes far more than your normal, run-of-the-mill word processor to master its convoluted structure. In fact, it takes a word processor with a high degree of smarts, one that's very nearly artificially intelligent.

What makes Japanese so difficult? For one thing, there are all those ideographs. Called *kanji*, or "Chinese characters," close to 2,000 are formally taught in the Japanese educational system, and you might encounter up to 3,000 or so in a morning newspaper. If that weren't bad enough, most of these icon-like

by

Howard

Katz



JAPANESE TO GO

symbols have multiple pronunciations, or *readings*. Readings determine meanings, and how a character or group of characters is pronounced is subject to a complex set of rules that make the internal workings of the Mac's ROM look like child's play by comparison.

There are only a limited number of readings that are used when characters are combined to form new words, and consequently there are many more homonyms in Japanese than there are in English. Homonyms, of course, are what you get when different words have the same pronunciation.

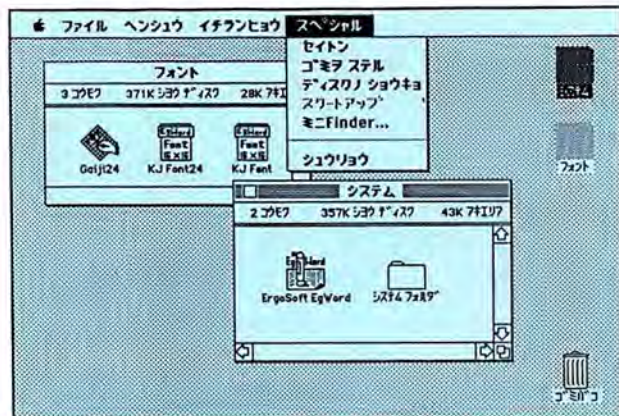
And there's more. In addition to the *kanji* character set, two other writing systems are in daily use as well. These two character sets, called *hiragana* and *katakana* separately, and *kana* collectively, employ an additional hundred-odd symbols that serve primarily as a phonetic alphabet, much as do the letters in our own English alphabet. With the *kana*, in other words, you can write what the *kanji* sound like.

The Japanese writing system uses a mixture of all three scripts in a tremendously complicated orthography (the art of writing words with the proper symbols) that is both a source of pride to the Japanese and the bane of Western students of the language. The rules of usage are so difficult to learn that it takes average Japanese students two to three years longer than their Western counterparts to master their own language.

The first problem that causes Japanese word-processor designers to go prematurely gray is this: With up to 3,000 characters and three writing scripts in daily use, how do you input text? One obvious solution is to build a bigger keyboard. And we're talking *big* here. What the Japanese—happily—have elected to do is to retain the traditional QWERTY keyboard—traditional at least in the West and adopted as a standard by most Japanese manufacturers—and to combine savvy software and raw computing ability to allow users to input kanji without really doing so.

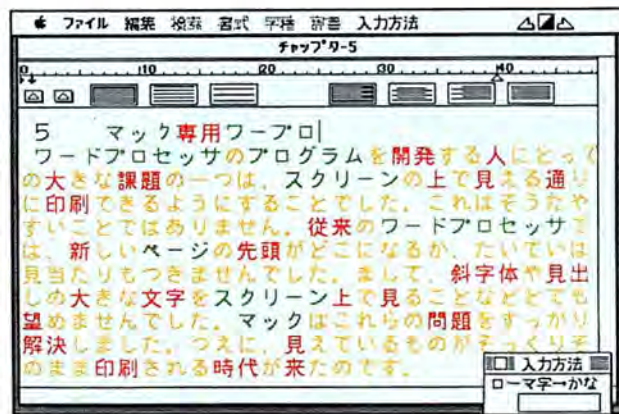
ErgoSoft has adopted this approach and it works well. The basic

The desktop. A small (5K) katakana font allows limited Japanese entry outside of *EgWord*. Things somehow look the same but different. Shown are the "Shisutemu" and "Fonto" disks "System" and "Fonts."

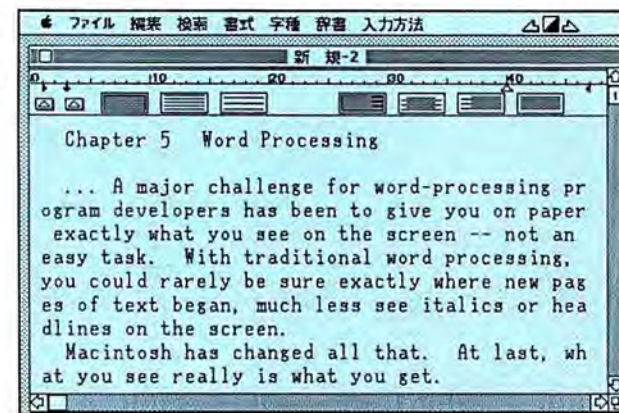


Chapter 5 from the Japanese translation of Cary Lu's *The Apple Macintosh Book*, showing all three Japanese scripts in daily use. Colors indicate *hiragana* in yellow, *katakana* in green and *kanji* in red.

The small "Input Method" window in the lower-right shows that English input is converted to *hiragana* on entry, before being converted to *kanji*. The user can bypass English entirely if desired.



The original English for the above. *EgWord* can be used in a pinch for English entry as well. Word-wrap is not a required feature in Japanese.



idea is that either kana or the English alphabet can be used to enter the phonetic representation of the text—to enter what the text *sounds like*. On command, the word processing software then consults a dictionary of kana-to-kanji translations and replaces the entered phonetic script on the screen with a "best guess" as to what kanji the user intended to use.

The best-guessing algorithm is complicated by the fact that one group of kana can represent many different kanji—the homonym prob-

lem discussed above. The secret of the software lies in how that best guess is derived, and this involves frequency tables of the Japanese language, the rules of Japanese grammar, and a knowledge of the context of what is being translated. Depending on the sophistication of the software, this best guess is generally, but not always, the one the user intended, and the user has to be able to easily modify the choices that the machine has made.

EgWord shines in this respect. The

lookup time is fast, and point-and-click makes changing kanji as easy as changing your mind. In fact, the company claims the fastest and most accurate kana-to-kanji conversions in the industry.

EgWord's conversion software swings into effect on command (press the ENTER key) or when the user types a period ("."), signaling the end of a sentence. The program can digest up to 500 kana at a time in producing a kanji conversion, and the company claims this is an industry-best as well. If you like the conversion, fine—otherwise press the ENTER key again and up pops a small window showing all the possible kanji candidates for the word under consideration. And there can be dozens, with more unlikely candidates appearing in a second window behind the first. Point with the mouse or cycle through the list with the ENTER key to select a new homonym and then hit RETURN to replace the selected text and go on to the next word. During the editing session, the *EgWord* dictionary disk resides

in the external drive, giving the program fast access to over 38,000 character and word entries.

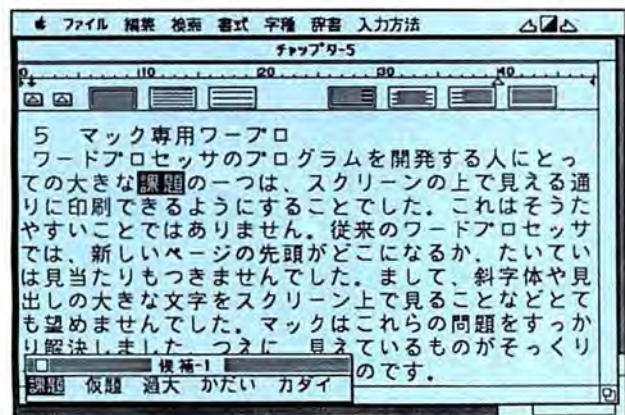
The visual characteristics of the Japanese language also push the capabilities of most micros, but the Mac is nothing if not a superb graphics machine and is easily up to the challenge. Kanji are written in a series of strokes and can become visually quite complex, requiring a fair degree of screen resolution so that the finer details of the characters are not lost. ErgoSoft draws its kanji in a 16-by-16 pixel matrix, which provides a pleasing visual screen appearance.

A 24-by-24 pixel font allows even finer reproduction on the ImageWriter. As you might imagine, these two fonts take a lot of room on disk—over 350K! The screen font is loaded from a fonts disk at the start of a session and resides in memory thereafter. The size of the fonts files is one of the reasons that *EgWord* requires a 512K Mac and two drives. Canon, which distributes Apple products in Japan, also offers a

"DynaMac"—a 512K Mac with the Japanese fonts in ROM.

EgWord can draw over 3,000 kanji, kana and special symbols. The ASCII standard, which utilizes seven bits out of an eight-bit byte, runs out of code numbers at 128. The Japanese have adopted a two-byte numbering scheme, promoted by the Japanese Institute of Standards and adopted by all Japanese manufacturers. The most frequently encountered 3,300 symbols are known as the JIS Level One character set. The remaining characters are quite rare by comparison and are known as JIS Level Two. *EgWord* allows full access to the JIS Level One set, and Level Two support is promised down the road.

All in all, *EgWord* is an impressive product that pushes the capabilities of the Mac to address an issue that involves over 100 million people. It's unlikely that ErgoSoft's offerings will find a large market in North America. In Japan, however, they just might enable the Mac to succeed against domestic competition. ☐



The conversion process in action. The hiragana entry "kadai" has just been converted to the two selected kanji shown. In this case the software has made the right choice, but we can look at other synonyms in the window at the lower-left by pressing ENTER, cycle through these choices and change our mind if desired.



A Japanese "Save" dialog. Look vaguely familiar? The CANCEL button reads "Kyanaseru" in Japanese, and the two righthand buttons read "Ijekuto" and "Doraibu," respectively.

EGWORD: REPORT CARD

Overall Rating: ●●●●

Follows Mac Interface:	●●●●
Printed Documentation:	●●●●●
On-Screen Help:	NONE
Performance:	●●●●●
Support:	●●●
Consumer Value:	●●●●

Comments: Japanese word processing, allowing full text-entry access to all written components of the language.

Best Feature: Speed and ease of use in an extremely complex language environment.

Worst Feature: Some confusing, non-standard use of Mac Interface (e.g., kana are automatically "selected" as entered prior to conversion).

List Price: \$300 (at current exchange rates).

Published by ErgoSoft, Japan. Distributed in North America by Counterpoint, PO Box 1685, Cambridge, MA 02238.

There's mail

SOFTWARE

Addison-Wesley			Entersoft			Magnum		
Smart Eyes (speed reading tutor)	36.		Quickpaint (find MacPaint files fast)	29.		McPic - Volume I	28.	
Affinity Microsystems			Quickset (icon-driven accessory)	29.		McPic - Volume II	28.	
Tempo (power user's macro utility)	79.		Quickword (word processing tool)	32.		The Slide Show Magician	34.	
Altsys			1st Byte			Manhattan Graphics		
Fontastic (create your own fonts)	27.		Speller Bee (spelling-learning tool)	42.		Ready Set Go (requires 512k)	105.	
Apropos			KidTalk ("talking notebook")	42.		Mark of the Unicorn		
Financial Planning (reqs. Multiplan)	51.		Smoothtalker (version 2.0)	57.		Professional Composer (reqs. 512k)	249.	
Investment Planning (reqs. Multiplan)	51.		Forethought			Microsoft		
Tax Planner (requires Excel)	35.		Typing Intrigue	29.		Entrepreneur	29.	
Arrays/Continental			Factfinder (free-form entry)	84.		Learning Multiplan and Chart	37.	
Home Accountant (reqs. external drive)	52.		FileMaker (custom design reports)	108.		Chart 1.05	72.	
Assimilation			Fortnum/Southern			Logo 1.0	75.	
MacTracks (macro utility)	22.		MacInooga Choo-Choo (reqs. 512k)	21.		Basic 2.1	87.	
MacMemory-Disk (reqs. 512k)	22.		MacNest (double screen scrapbook)	25.		Multiplan 1.1	105.	
MIDI Composer (music record/playback)	22.		MacChemistry	89.		File 1.02	111.	
Business-Essentials (correspondence)	65.		Great Wave Software			Word 1.05	111.	
MacSpell-Right (40,000 word dictionary)	69.		Cornet Halley	18.		Fortran 2.1	169.	
Right-Word (spell checker & thesaurus)	69.		ConcertWare+ (music composition)	39.		Excel 1.0	225.	
ATI			Greene, Johnson			Miles Computing		
Teach Yourself Multiplan	39.		Spellswell (incl. homonym dictionary)	29.		Mac the Knife - Volume I	21.	
Jazz Training	39.		Harvard Associates			Mac the Knife - Volume II	25.	
Excel Training	39.		MacManager (business simulation)	29.		Mac the Knife - Volume III	27.	
Batteries Included			Desktoppers (new desk accessories)	29.		Mindscape		
The Mac BatteryPak (desk accessories)	27.		Hayden Software			The Perfect Score: SAT	47.	
Blyth Software			DaVinci Buildings	29.		Monogram		
Omnis 3 (requires 512k, external drive)	245.		DaVinci Interiors	29.		Forecast	40.	
Borland International			DaVinci Landscapes	29.		Dollars & Sense	81.	
Sidekick (unprotected)	44.		DaVinci Building Blocks	46.		Nevins Microsystems		
BrainPower			DaVinci Commercial Interiors	114.		Turbocharger (requires 512k)	55.	
PowerMath (requires 512k)	52.		Art Grabber with Body Shop	29.		New Canaan MicroCode		
StatView (statistics package)	99.		Turbo Turtle	35.		Mac Disk Catalog II	32.	
CAMDE			I Know It's Here Somewhere	35.		Odesta		
Nutricalc (diet & nutrition analysis)	49.		MusicWorks	45.		Helix (requires 512k, external drive)	219.	
Casady Company			Hayden:Speller	45.		Organizational Development		
Fluent Fonts (two-disk set)	29.		Score Improvement System for the SAT	57.		Consultant (idea management)	call	
Central Point Software			VideoWorks	57.		Palantir		
Copy II Mac (includes MacTools)	20.		Hippopotamus Software			MacType (supports Dvorak keyboard)	26.	
Challenger Software			Hippo Computer Almanac	21.		MathFlash (math flash card drills)	26.	
Mac3D (3D graphics, CAD features)	125.		Hippo-Lock (file security program)	68.		WordPlay	26.	
Chang Labs			Hippo-C - Level 1	79.		Accounts Receivable	69.	
Rags to Riches Ledger	99.		Hippo-C - Level 2	219.		General Ledger	69.	
Rags to Riches Receivables (reqs. 512k)	99.		Ideaform			Inventory Control	69.	
Rags to Riches Payables (reqs. 512k)	99.		MacLabeler (print disk labels)	29.		inTouch (communication to emulation)	79.	
Rags to Riches Three Pak	249.		Innovative Data Design			PBI Software		
Creighton Development			Paste-Ease (requires MacPaint)	35.		Icon Switcher	14.	
MacSpell+ (requires 512k)	55.		MacDraft (requires 512k)	139.		Icon Fun & Games Library	14.	
DataFood			Kensington			Icon Business Library	14.	
DrawForms (requires MacDraw)	30.		Graphic Accents	29.		Peachtree		
MacForms (requires MacPaint)	42.		Type Fonts for Text	29.		Back to Basics General Ledger	88.	
Digital, Etc.			Type Fonts for Headlines (reqs. 512k)	42.		Accounts Payable	88.	
Macaccountant	139.		Layered			Accounts Receivable	88.	
Dilithium Press			Front Desk (scheduling/organizer)	77.		Polarware		
PC to Mac & Back (link your PC)	79.		Legissoft/Nolo Press			Graphics Magician	47.	
Dow Jones			WillWriter (prepare your own will)	27.		Protekt-it Software		
Straight Talk	45.		Linguist's Software			ProCopy/ProEdit	29.	
Spreadsheet Link	56.		MacCyrillic	39.		ProVUE Development		
Market Manager PLUS	109.		SuperFrench/German/Spanish	39.		OverVUE 2.0 (power-packed database)	149.	
Dreams of the Phoenix			Tech (1000 different symbols)	59.		QED Information Sciences		
Day Keeper Calendar	27.		MacArabic	59.		Typing Made Easy	36.	
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Mouse Exchange Terminal	27.		MacKorean	59.		Dinner At Eight (recipes to wines)	35.	
Quick & Dirty Utilities Vol. 1	27.		SuperGreek	59.		Satori		
Twelve-C Financial Desk Accessory	27.		SuperHebrew	59.		BulkMailer (mailing lists)	79.	
Electronic Arts			SuperGreek/Hebrew/Phonetics	89.		Scarborough Systems		
Financial Cookbook	32.		Living Videotext			Mastertype (typing tutorial)	25.	
Deluxe Music Construction Set	32.		ThinkTank 512k (outline processor)	101.		Sierra On-Line		
						MacOneWrite (cash disbursements)	137.	
						MacOneWrite (accounts receivable)	137.	

Founders' sale.



Happy days are here again.

Too bad Lucian and Lucius Tinker weren't around to see

Lucian always had the time to answer a stranger's questions. They dealt fairly with

Marlow (pop. 550) transformed from a sleepy little rural village

into an upbeat microcomputer paradise. We've spruced up a few of the old hotels and mill buildings to house our bur-

geoning Mac business. But the old beams are still there, and real wooden clapboards still grace the exterior walls. With all due respect to Silicon Valley we're pretty fond of life up here in the hills.

time, but the Tinker twins are finally getting the recognition they've always deserved. Two honest and intelligent faces symbolizing many of the characteristics that make MacConnection the leading name in Macintosh mail order.

You see, folks like the Tinker twins wouldn't think twice about spending an hour getting a neighbor's cow out of the mud. And today, our Mac technical specialists wouldn't think twice about spending time helping one of our customers out of an electronic quagmire.

Lucius and

friend and foe alike. And they always did a job when they said they were going to.

But we can't live up to *all* their standards. It's hard to find real silk ties these days. Those starched collars are sort of uncomfortable. And buttoning the top button of our jackets looks a little strange. But business in Marlow is as personal and forthright now as it's always been. The Tinker twins wouldn't

have it any other way.



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The more things change...

Yes, it took a long



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Silicon Beach Software

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Simon & Schuster

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Paper Airplane Construction Kit 24.

Typing Tutor III 31.

SMB Development

MacMate (requires 512k) 35.

SoftStyle

Epstart 27.

Jetstart 27.

Toshstart 27.

Tlstart 49.

Laserstart 59.

Decision Map 79.

Softview I, Inc.

MacInTax 1985 (tax prep & planning) 53.

Software Publishing

PFS:File/Report 100.

Springboard

Art a la Mac Vol. 1-People and Places 23.

Art a la Mac Vol. 2-Variety Pack 23.

State of the Art

Electric Checkbook 42.

Symmetry

Quick Disk (requires 512k) 21.

T/Maker

Click Art Personal Graphics 29.

Click Art Publications 29.

Click Art Letters 29.

Click Art Effects 29.

ClickOn Worksheet 46.

Telos Software

Flevision (graphic filing program) 99.

Business Flevision 219.

Think Educational

Mind Over Mac 29.

MacEdge II (math & reading) 29.

Videx

MacCalendar (incl. reminder system) 51.

GAMES

Activision

Hacker 27.

Mind Shadow 27.

Ann Arbor Softworks

Grid Wars (3D graphic arcade) 28.

Bantam Electronics

Sherlock Holmes: Another Bow 27.

Blue Chip

Millionaire (stock market) 30.

Tycoon (commodities) 30.

Baron (real estate) 30.

Squire (personal finance, reqs. 512k) 30.

BrainPower

Think Fast (improves recall) 23.

Chipwits 26.

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through April 30, 1986

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The 10 and 20 megabyte hard disk subsystems for your Mac.

Includes:

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- Comes with its own power supply
- Includes an extra serial port
- Weighs only 5 pounds
- Full one-year warranty

Paradise 10MB 549.

Paradise 20MB 799.

Broderbund Software

Lode Runner 24.

Cyborg (sci-fi text adventure) 24.

Ancient Art of War (military strategy) 27.

CBS

Murder by the Dozen 25.

Electronic Arts

One on One/Dr J vs Larry Bird (reqs. 512k) 27.

Pinball Construction Set 27.

Epyx

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Temple of Apshai Trilogy (4 levels) 24.

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Gamestar

Championship Star League Baseball 22.

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Word Challenge II (boggle-like game) 24.

Perplex (scrabble-type game) 24.

Sargon III (9 levels of chess) 29.

Infocom

Seastalker (junior) 24.

Cuthroats (standard) 24.

Enchanter (standard) 24.

Hitchhiker's Guide (standard) 24.

Planetfall (standard) 24.

Wishbringer (standard) 24.

The Witness (standard) 24.

Zork I (standard) 24.

Zork II (advanced) 27.

Zork III (advanced) 27.

A Mind Forever Voyaging (advanced) 27.

Infidel (advanced) 27.

Sorcerer (advanced) 27.

Suspect (advanced) \$27.

Deadline (expert) 29.

Spellbreaker (expert) 29.

Starcross (expert) 29.

Suspended (expert) 29.

Invisiclus (hint booklets) 6.

Magnum

Gypsy (the Computer Oracle) 23.

Mark of the Unicorn

Mouse Stampede (highly addictive) 23.

Miles Computing

Fusillade 21.

MacAttack (3-D tank simulation) 27.

Harrier Strike (3-D flight simulation) 27.

MacWars (hours of fun) 27.

Mindscape

Rambo: First Blood Part II 24.

James Bond 007: "A View to a Kill" 24.

Stephen King's "The Mist" 24.

Racter (converse with your Mac!) 27.

Balance of Power 30.

Déjà Vu (murder mystery) 33.

Origin Systems

Exodus: Ultima III (fantasy adventure) 38.

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Feathers & Space 21.

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The Quest 24.

Xyphus (role playing adventure) 24.

Priority Software

Forbidden Quest 24.

Gateway (sci-fi fantasy adventure) 25.

Psion

Psion Chess (3D and multi-lingual) 31.

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Frogger (classic video game) 24.

Championship Boxing 24.

Ultima II (role-playing adventure) 35.

Silicon Beach Software

Airborne! (digitized-sound war game) 21.

Enchanted Scepters (text & graphics) 24.

Sir-Tech

Mac Wizardry 36.

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GATO (submarine simulation) 26.

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Telarium

Amazon 27.

Dragon World 27.

Fahrenheit 451 27.

1-800/Mac&Lisa 570U

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* Defective software replaced immediately. Defective hardware replaced or repaired at our discretion. Some items have warranties up to five years.

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e Marlow hills.

Unicorn

Futura (sci-fi adventure)	\$24.
Utopia (science fantasy game)	24.
Animal Kingdom (ages 6-12)	27.
Mac Robots (pre-school program)	27.
Videx	
MacCheckers/Reversi	28.
MacGammon/Cribbage	28.
MacVegas	34.

HARDWARE

Assimilation

MacPort-Adaptor	69.
Mac-Epson-Connection	75.
MIDI Conductor	75.
Mac-Daisywheel-Connection	79.
Mac-Turbo-Touch	79.
Numeric-Turbo	129.
Compucable	
Mac to Hayes Smartmodem cable	16.
Mac to Apple modem cable	16.
Mac to Hayes Transet 1000 cable	16.
Cuesta Systems	
Datasaver AC Power Backup (90 watts)	call
Curtis Manufacturing	
Diamond (6 outlets)	28.
Emerald (6 outlets; 6 ft cord)	34.
Sapphire (3 outlets; EMI/RFI filtered)	44.
Ruby (6 outlets; EMI/RFI filtered; 6 ft cord)	50.
Epson	
AP-80 (Imagewriter compatible)	call
FX-85	call
FX-286 (replaces FX-185)	call
LQ-1000 (letter quality dot matrix)	call
Ergotron	
MacTilt (incl. external drive bracket)	75.
Hayes	
Smartcom II (communications software)	86.
Smartmodem 1200	call
Smartmodem 2400	call
Transet 1000	call
IOMEGA	
Bernoulli Box (dual 10-MB storage)	2475.
10-Meg Cartridge	call
Head Cleaning Kit	call
Kensington	
External Disk Drive Cover	8.
Mouseway	8.
Mouse Pocket	8.
Mac Dust Cover	9.
Imagewriter Dust Cover	9.
Mouse Cleaning Kit w/Mouse Pocket	16.
Universal Printer Stand	17.
Disk Case (holds 36 Mac disks)	19.
Disk Drive Cleaning Kit	19.
Tilt/Swivel	22.
Polarizing Filter	31.
Surge Suppressor	32.
Starter Pack (includes Tilt/Swivel)	53.
A-B Box	60.
Control Center	61.
Koala Technologies	
KAT Graphics Tablet	139.
MacVision (digitizer)	169.
Kraft	
QuickStick	45.
Microsoft	
MacEnhancer	159.

Mitsuba

Super 5 400k External Drive	\$199.
Super 5 800k External Drive	325.

Mouse Systems

A+ Optical Mouse	59.
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N² Products

Mac to Modem cable (6 feet)	19.
Mac to Printer cable (6 feet)	19.
Mac to Transet 1000 cable (9 ft.)	19.

Paradise Systems

Mac 10 (10 megabyte hard disk)	special
Mac 20 (20 megabyte hard disk)	special

PBI Software

Switch Box	36.
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PKI

Sydneyndr 400k External Drive	225.
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Systems Control

MacGard (surge protection)	55.
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Thunderware

Thunderscan (high-resolution digitizer)	175.
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Video 7

MouseStick	39.
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DISKS

BASF 3 1/2" Disks (box of 5)	12.
Sony 3 1/2" Disks (box of 10)	21.
Fuji 3 1/2" Disks (box of 10)	21.
MAXELL 3 1/2" Disks (box of 10)	22.
Memorex 3 1/2" Disks (box of 10)	23.
Verbatim 3 1/2" Disks (box of 10)	23.
3M 3 1/2" Disks (box of 10)	24.
Sony 3 1/2" Double-sided Disks (10)	33.
MAXELL 3 1/2" Double-sided Disks (10)	33.

INFORMATION SERVICES

Compuserve

Compuserve Information Service	27.
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Source Telecomputing

The Source (subscription & manual)	30.
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MISCELLANEOUS

Automation Facilities

Floppyclene Drive Care Kit	20.
MacPak Complete Care System	29.

Clean Image Ribbon Co.

Clean Image Ribbon Kit	12.
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Computer Coverup

External Disk Drive Cover	4.
Imagewriter (II) Cover	8.
Wide Imagewriter Cover	8.
Mac & Keyboard (two covers)	10.

Diversions

Underware Ribbon	10.
ColorPack (includes Colorpens)	19.

Environmental Software Company

The Clutch (holds 8 disks)	9.
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MACATTIRE

High quality rip-stop nylon dust covers.

External Drive Cover (400k & 800k)	7.
Numeric Keypad Cover (fits Turbo Touch)	7.
Imagewriter (II) Cover	11.
Mac (Plus) & Keyboard Cover	15.
Laserwriter Cover	17.
Mac (Plus) & HD20 & Keyboard Cover	17.

I/O Design

Imagewriter Color Transfer Ribbon	10.
Imageware	45.
Imageware wide	49.
Macinware	59.

Innovative Concepts

Flip & File Micro (holds 25 disks)	\$9.
Flip & File (holds 40 disks)	18.

Innovative Technologies

The Pocket Pak (holds 6 disks)	10.
The Easel (holds 20 disks)	14.
The Disk Directory (holds 32 disks)	21.

Kalmar Designs

Teakwood Roll-top Case (holds 45 disks)	14.
Teakwood Roll-top Case (holds 90 disks)	21.

Magnum

Mouse Mover (let your mouse ride!)	14.
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Microsoft Press

Microsoft Multiplan: Of Mice and Menus	13.
Midnight Madness	14.
The Printed Word	14.
Apple Mac Book Vol. 2	15.
Macinations (intro to Basic)	16.
Excel in Business	18.

Moustrak

Moustrak Pad (standard 7"x9")	8.
Moustrak Pad (large 9"x11")	9.
Imagewriter Pad	12.

Pacific Wave

Flip Sort Micro (holds 60 disks)	15.
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Ribbons Unlimited

Imagewriter Color Ribbons	5.
Imagewriter Ribbons Six Pack	27.
Imagewriter Rainbow Six Pack	27.

Smith & Bellows

Mahogany Disk Case, made by New England Craftsman (Holds 90 disks)	24.
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ON YOUR MACS...

Get Set, Get Ready—

Set—Go! Version 2.0!

EARLY IN 1985, THREE MACINTOSH programs created a new genre of microcomputer applications—desktop publishing. The concept had been tried on other computers with only limited success (Broderbund's Apple II and Commodore 64 program *The Print Shop* gave users limited abilities to mix graphics and text), but thanks to the Mac's superb resolution and ability to integrate words and text created with different applications, desktop publishing became the "hot" genre in the microcomputer industry.

MacPublisher from Boston Software, *PageMaker* by Aldus Corporation and Manhattan Graphics' *ReadySetGo* provide users with the basic functions of typesetting and page layout, the cornerstones of graphic arts. With each of these applications, a single person at a computer can construct a professional-looking layout with text (from a word processor

such as *MacWrite* or Microsoft *Word*) and pictures (from *MacPaint* and others) as well as decorative elements like black and gray blocks, lines (called "rules" in publishing parlance) and borders. Suddenly, microcomputers—and the Macintosh in particular—could be valuable tools for assembling advertising and promotional materials, books, newsletters and magazines.

ON THE MARK

ReadySetGo was the first desktop publishing program to come from a graphic arts company which recognized the Mac's potential early on. Manhattan Graphics was looking for an inexpensive way for customers to better use its own commercial typesetting service. Instead of just mimicking the "front end" of a typesetting system—the computer-based text-entry portion—*ReadySetGo's* authors made an effort to duplicate the functions of the layout artist's drafting table.

At the heart of *ReadySetGo* is its ability to "flow" or "pour" text onto a page in multiple columns of vari-

By Tim Orosko

ON YOUR MACS!

ous widths and lengths. Visuals can be mixed with this text and the entire layout can be continually changed according to the user's whims. One column can be made wider or shorter, a picture may be moved from the top to the bottom of the page, a box can be drawn around the text to highlight it, shaded areas can be dropped behind a picture or text to create a more attractive treatment, graphics can be resized, text edited and "spec'd" (fonts and styles specified) and so on.

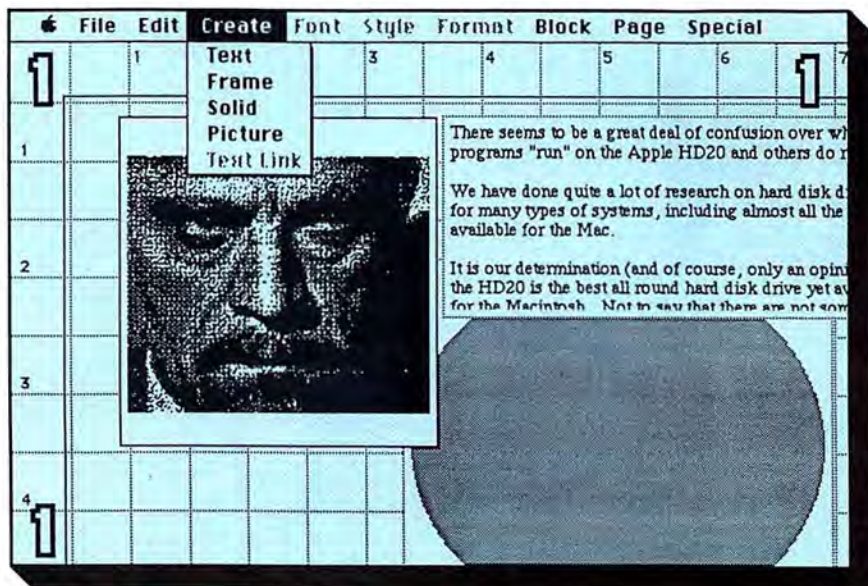
The first version of *ReadySetGo* accommodated only a single layout page and required that text and pictures be brought into the program via the Clipboard or, in the case of text, be entered directly from the keyboard. A new edition of the program, version 2.0, is now available that greatly expands its capacity and capability. Multiple page layouts can now be created, and text can be brought in from word processing files.

In addition to greater flexibility, *ReadySetGo* can handle a large number of the individual parts of a publication. Up to 32 pages can be stored in a single disk file, and each page can contain up to 100 blocks (a block can contain a picture, text or graphic element), or up to 1000 total for the entire publication.

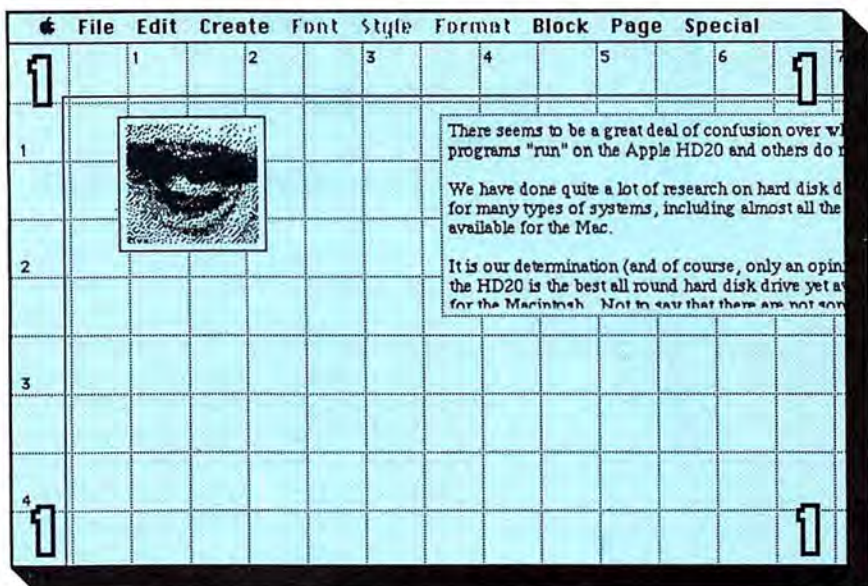
Blocks that contain text are limited to 30K, that is 30,000 characters including spaces and numbers. So the practical limit of one long piece of text is about 5000 words or the equivalent of 20 manuscript pages. Longer files will require division using the cut-and-paste features of a word processor.

SETTING UP SHOP

ReadySetGo is supplied on a single, unprotected disk, making backup copies and installation on a hard disk both possible and simple. When the program is ready, a grid of half-inch squares—the electronic equivalent of graph paper—appears on the screen, and the page number is identified by large outlined numbers in each corner. Each new RSG file starts this way. To add pages, just pull down the Page item off the menu bar and



ReadySetGo's main screen. Element blocks are created by selecting the block type from the Create menu. Note the Picture, Text and Solid blocks on the screen.



Graphics blocks can be both resized and cropped. The face in the Picture block has been cropped to show only one eye.

select ADD A PAGE. It's a good idea to determine, or at least estimate, how many pages you'll need at the start.

There are some significant differences between the way RSG works and what most people know as the "standard" Macintosh user interface. For instance, while the screen represents only one portion of a larger sheet (letter, legal size, etc.), there

are no scroll bars to move the sheet within the screen window. Instead, "Show Page" under the "Special" menu brings up a mini-page and a movable frame that corresponds to the size of the screen. Users move around the RSG page by repositioning this frame.

The areas of the page that will contain text, pictures, graphic elements, boxes and rules are simply

labeled TEXT, PICTURE, SOLID and FRAME blocks. (A fifth type, the TEXT LINK block, is used to continue text from one column to another. More on this later.)

A block begins life on the page as a one-inch square box. At first, moving and resizing blocks is frustrating, since they don't behave the way conventional Macintosh windows do. A block can only be moved by placing the tip of the cursor arrow just underneath its top border; resizing happens when the lower right-hand corner of a block is touched just inside the block border. Unfortunately, there are no visual indications that you're ready to drag or size the block, or even to indicate that you're touching it in the correct place. After a few tries, the trick comes naturally, yet this inconsistency remains annoying.

The MODIFY item underneath the Block menu comes to the rescue when precision in size or position is required. By entering measurements in inches into slots in a dialog box, fine-tuning for accuracy is possible.

As with other desktop publishing programs, work is simplified if you come to the layout session with

some concrete ideas about where things will appear on each page. The best idea is also the oldest: Make a "dummy" page—a sketch or schematic of how the page will look—before you start. Then, by placing the appropriate number of blocks of the proper size on the page, your work can proceed more easily.

View an electronic version of the dummy page by selecting SHOW PAGE. Each element is represented symbolically. Pictures, for instance, are differentiated from text by crossed lines that occupy picture blocks. Other options, DISPLAY PAGE and DISPLAY FACING PAGES, give a true version of the page in reduction, including miniature (and unreadable) text and graphics.

LET THE QUIPS FALL WHERE THEY MAY

It's possible to position and size a text block that would fill a single RSG page, but that would defeat the purpose. More than likely, you'll want to create several columns, perhaps of different widths. After creating the first text block, where the story or text begins, every other block in which the story will contin-

ue should be created as a "text link" block. Each such block refers directly to the first block and works in conjunction with it.

Flowing or pouring in text begins by touching the first text block (to make it an active window) and selecting a *MacWrite* or *Word* document using the GET TEXT command under the File menu. RSG only works with ASCII text files, so when the dialog box appears, it shows the word processing files that have been saved using the "Text Only" option. Formatted *MacWrite* or *Word* documents don't register as being available.

The text quickly appears in the proper width within the active text block and, if there are other text link blocks on the page and the story is long enough, continues in those as well.

Since RSG uses unformatted text files, type styles—different fonts, boldface, italics—must be edited into the text in the same manner that these selections are made in *MacWrite*. This is accomplished by highlighting text, then selecting font, style and size from the appropriate menus at the top of the screen.

TIPS FOR DESKTOP PUBLISHERS

The desktop publishing programs available for the Macintosh represent the beginning of a true revolution. For once, the power required to produce a professional-looking publication is available to anyone with (at most) the price of a new Toyota. This not only offers enormous entrepreneurial opportunities, but will improve the way that we communicate with each other on a daily basis. Very simply put, these publishing systems make information easier to convey.

Making page layouts with this new software can be simple, or it can be extraordinarily frustrating. When using any desktop publishing program, here are a few tips to make things easier:

- While each of these programs offer text-editing capabilities, do your editing on a word processor. Not only is it faster and simpler, but the layouts won't require constant adjustment if you use text already

in its finished form while creating a page. Generate galleys—printed versions of the text in the same column width you'll be using—to proofread and measure text.

- Plan ahead. Gather all the necessary text and pictures before going into a layout session. By assembling all of these elements beforehand, you can experiment more with the layout itself without the need to pull text files and pictures from disks one at a time. Since most of these publishing programs use lots of disk space, create a single floppy disk (or folder on your hard disk) for the text and pictures you'll need.

- Use dummy pages. Even though these are powerful programs, few of them allow you to visually plan your page. (*ReadySetGo* comes closest, though.) A dummy, especially for a multiple-page publication, can save hours of layout. When translating the dum-

my to the computer screen, place photographs (or boxes that represent them), rules and other graphic elements first. Then flow the text onto the page. This will save much of the constant readjustment that is otherwise required.

- Study other people's layouts. When reading a book or magazine, notice the way that pages are set up, where photos are placed, how graphs are displayed, when rules and other elements are used, and other style points. Don't be ashamed of limited artistic talent. Sometimes a little creative "borrowing" can spark a layout.

- Even though it's been said a million times before, *back up your work*. It's agonizing to lose the word processing file that you've been working on for an hour or so, but downright depressing to lose a newsletter layout that you've had on your screen for the better part of two days.

ON YOUR MACS!

(Some of the standard MacWrite shortcuts, such as COMMAND-B for boldface, will also work.) Centering and justification is handled this way, too.

If you want to adjust the text in each of two or more blocks, they can be resized, shortened to eliminate unwanted single lines at the bottom or top of a column (called "widows" and "orphans" in printers' jargon),

or expanded to extend the number of lines in a single block. When any blocks are resized for this reason, the text in them doesn't automatically change.

Under the menu item named Block are two commands, REFLOW and VACUUM, which do exactly what they sound like. Reflow pours the text into all of the blocks once again, readjusting for the new block sizes.

Vacuum sucks all of the text back into the first text block so that text link blocks can be changed or new ones added.

PICTURE THIS

Naturally, a publication requires graphic elements other than typography and rules. *ReadySetGo* uses the Scrapbook to transfer *MacPaint* and other bit-mapped images (such as those from the Thunderscan scanning digitizer and Koala's MacVision video digitizer) to a page layout.

Once a conventional cut-and-paste is made from the Scrapbook—in this case into a specific active picture block, rather than the document as a whole—pictures can be cropped and scaled, reduced or enlarged. Cropping is as simple as just resizing the picture block, dragging the bottom left corner of the block. Of course, if you resize the block larger than the original, the page displays only white space.

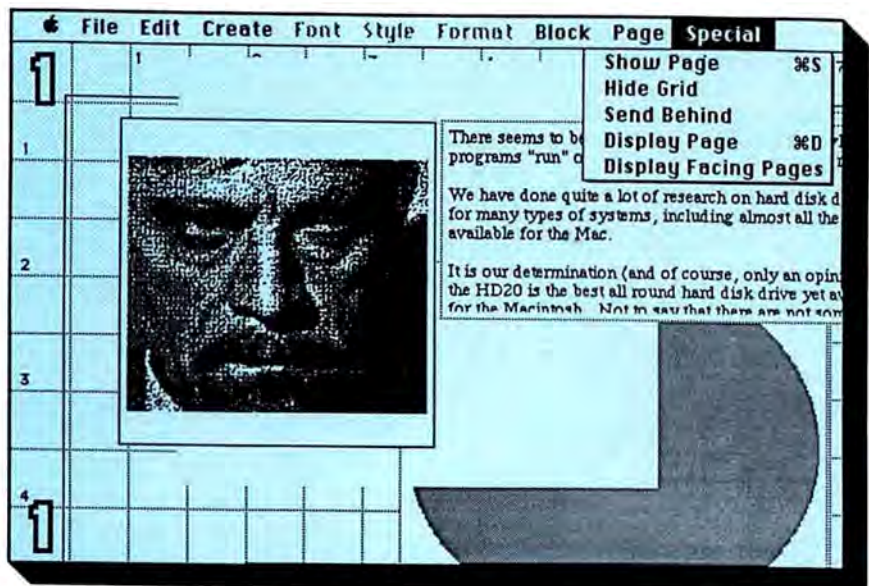
Reposition a picture within the block by clicking the mouse button while pointing to any of eight regions around its center. Clicking on the left topmost region of the block will, then, shift the picture up and to the left.

Scaling a picture can only be done through the "Modify" dialog box found under the Block menu. Images can be squashed or stretched by varying the scale horizontally or vertically, specifying each by a number typed into the box. The beauty of being able to reduce pictures, naturally, is that a far better resolution is achieved. Macintosh screen pictures—including Thunderscan and MacVision images—have a resolution of 72 dots per inch. Results are more impressive if an image is reduced to less than 100% of its size, particularly when printing with a LaserWriter. While the effect still can't match the quality of traditional halftoning, it looks very rich and detailed.

When working with *MacPaint* documents within *RSG*, it's often easier to use a desk accessory like MacroMind's *Art Grabber* (published by Hayden) than to rely on the Scrapbook. *Art Grabber* can open a *MacPaint* document while in



Hayden's *Art Grabber* desk accessory is a must for pulling graphics elements directly out of *MacPaint* files and pasting them into Graphic blocks in *ReadySetGo*. Otherwise, graphics are brought in through the Scrapbook.



The Special menu includes commands for previewing a full page and facing pages, toggling the registration grid, and assigning foreground-background prioritizations to blocks.

any other program (including RSG) and cut larger-than-screen-sized portions of it to the Clipboard.

The limitation of using only bit-mapped images is a serious one, but there are ways to include pictures from other programs like *MacDraw* or Microsoft's *Chart*. Since all pictures are transferred into RSG by means of the Clipboard, you can bring in screen images from these programs by taking a screen "snapshot" (pressing Control-Shift-3 keys) or capturing a portion of the screen with the aid of any of the public-domain FKEY (function key) routines that perform this function.

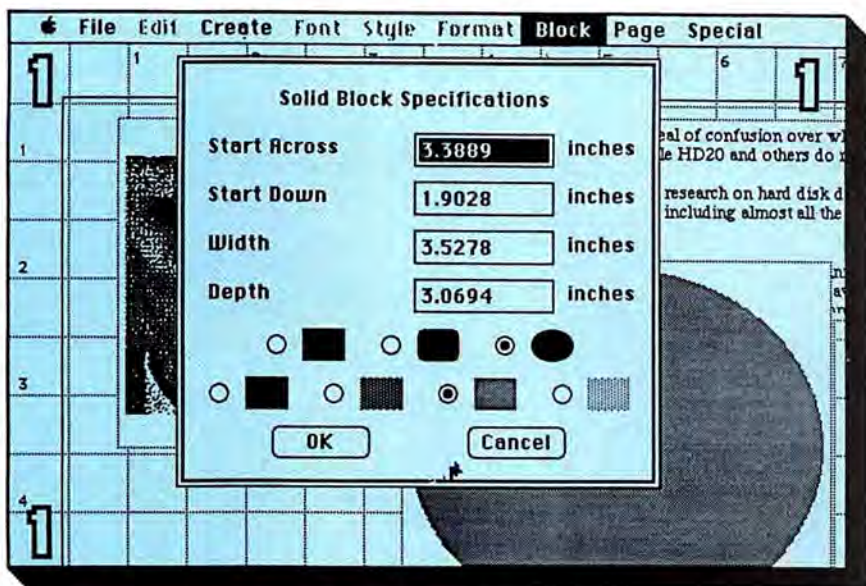
THE RULE OF RULES (AND OTHER GRAPHIC ELEMENTS)

The creative use of elements like boxes, rules and "tints" (gray shaded areas comprised of dots) is what gives publications a professional sheen. RSG treats these simple graphic pieces in a far different manner than other desktop publishing software or even graphics programs like *MacDraw* and *MacPaint*.

For one thing, RSG makes no distinction between large solid boxes and thin lines. A line is just a "Solid" block—chosen from the Create menu once again—that is compressed in one dimension. Squeeze it horizontally to get a vertical line and vertically for a horizontal rule. Like every other block, it can be resized and repositioned either with the mouse or from a dialog box.

In addition to their logical use to separate unrelated blocks, lines or rules are often used as decorations. A vertical line placed in the space between two columns (called the "gutter") adds a distinctive, businesslike look to a page. It works best in very thin line widths. Narrow horizontal rules can be used effectively to separate data in catalogs or listings. In both cases, RSG allows users to set the line width to as narrow as .0139 inch or 1 point (1/72nd of an inch). Coupled with RSG's very powerful tabular capabilities, rules can be used to quickly generate forms and charts.

Solid blocks need not remain black, nor must they stay rectangular. The MODIFY dialog box that appears when a solid block is active



The Solid Block dialog box appears when a new block is created or an exiting block is specified. The four gray tone values cannot be edited, but the block can be placed with extreme precision on the page.

offers the choice of black or three shades of gray, and can transform a rectangle to one with rounded corners or to a circle. Stretching the circle yields an oval.

Likewise, a "Frame" block—essentially a box—is made with a click on the Create menu. Modify the box by rounding its corners, or change it to a circle or an oval of specified dimensions. The frame's lines (minimum 1 point in width) can also remain black or tinted in one of the gray shades. Combining pictures, charts or graphs with shaded frames or blocks—you place the larger shaded areas behind the picture with a SEND TO BACK command item—gives the same very contemporary look as

you'll find in the graphics used by the *New York Times*, *Wall Street Journal* or *USA Today*.

MORE FOR YOUR MONEY?

Perhaps one of the best reasons for choosing *ReadySetGo* over other desktop publishing programs for the Mac is a simple one.

Money.

At \$125, RSG is a good bargain, and, while it is in some ways limited, it may be all the power some people will require. Its text-handling capabilities, including the ability to set interline spacing (called "leading" by printers from the days when a thin slice of lead was inserted between

(continued on page 119)

REPORT CARD: READYSETGO 2.0

Overall Rating: ...

Follows Mac Interface: ...
Printed Documentation:
On-Screen Help: ..
Performance:
Support: ...
Consumer Value:

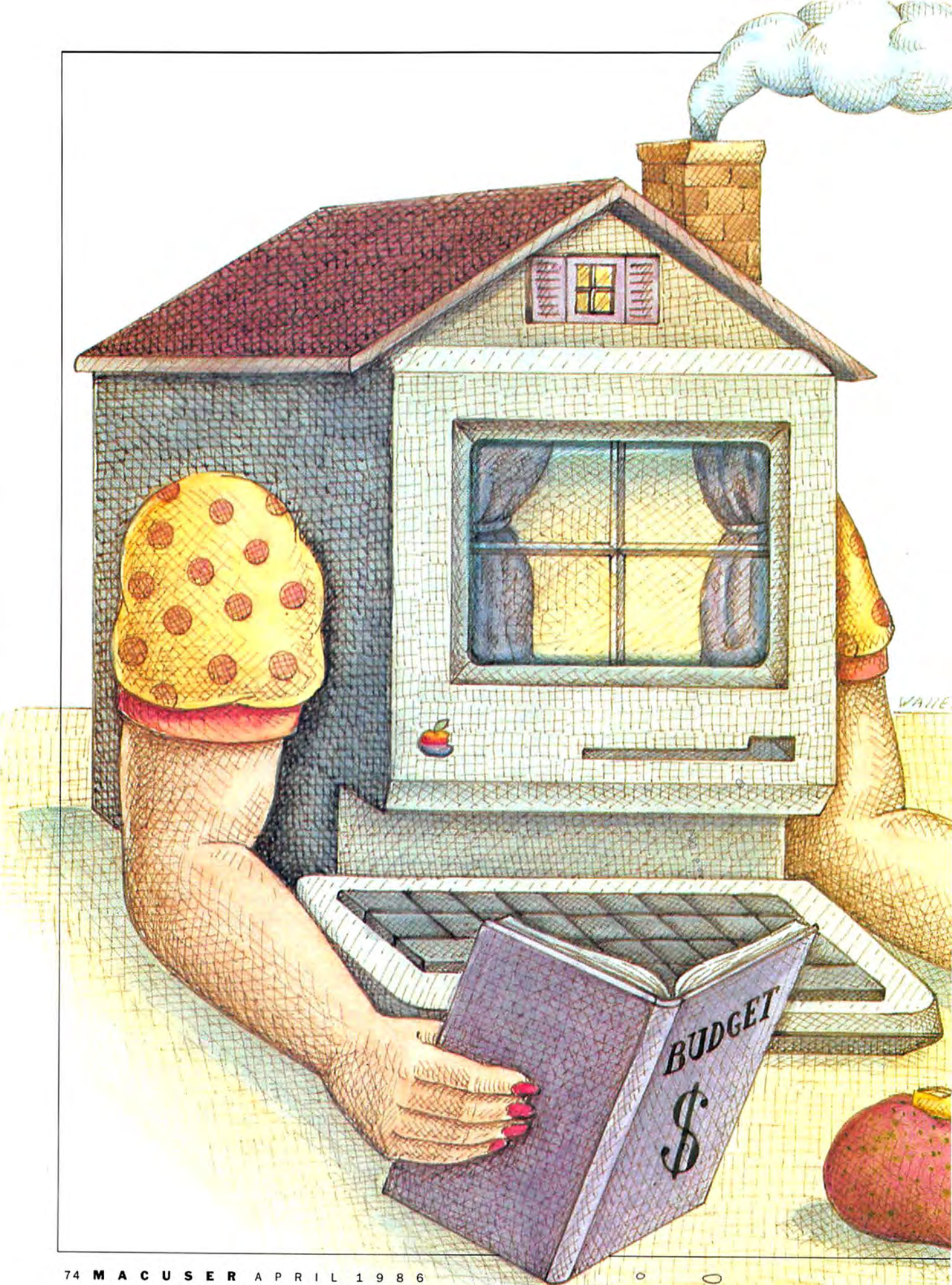
Writer and LaserWriter support; can display both pages of a spread.

Worst Feature: Can't read formatted *MacWrite* or *Word* files; needs scroll bars; text and graphic block windows should have visible "drag" corners.

List Price: \$125.

Requires 512K and printer. Published by Manhattan Graphics, 163 Varick Street, New York, NY 10013, (212) 924-2778.

Comments: Low-priced page layout application that can set up to 32 pages of a single newsletter.
Best Feature: Excellent Image-



BREAD AND BUTTER BUDGETING

by
**Bonnie
Walker**

***From investing in a
condo to reducing your
food bills, HAMac can
help you plan your
(future) fortunes.***

"A FOOL AND HIS MONEY are soon parted," or so the saying goes. Even though most of us aren't fools, we are still soon parted from our money no matter how wisely we try to budget it. *The Home Accountant and Financial Planner for the Macintosh (HAMac)* won't keep you and your money together longer, but it will at least provide a detailed set of records explaining where it all goes. In other words, it won't prolong the marriage, but it will help you plan for the divorce!

The *HAMac* and your personal system revolves around the personal

checkbook you use to deposit income and write your bills. You can have several bank accounts (checking, savings, investment, etc.). Your transactions, however, will be assigned to one set of "categories" or "accounts."

DEFINING CATEGORIES

Your first task is to define and enter your categories (up to 200), either all at once or as you go.

Each category must be assigned a "type," such as income, asset, charge account, expense, liability, or bank account. An asset is a possession that has value such as a car or a house or a computer. Cars and computers usually depreciate; houses often appreciate. Users can enter the current value and estimate the amount each asset will appreciate or depreciate. Any asset that gathers interest or even dividends and capital gains, probably works best as a bank account in which deposits and withdrawals can be made.

Charge accounts like Visa, American Express or gasoline credit cards can be identified as either charge accounts or expenses. Since a gaso-



BREAD AND BUTTER BUDGETING

line credit card is one account with one category of purchases, it is probably easier to make it an expense. A charge account category lets you enter purchases from different vendors and assign each to a different category. You can also create a category such as "finance charge" and keep track of that (currently) tax deductible expense.

A liability is a debt you owe. The main problem with liabilities is that the payment is usually split into at least two categories, interest and principal. You should do an amortization table, entering the starting amount of each loan you have, the amount of loan, interest rate, etc. and create three categories.

For example, Jan Hartle bought a house costing \$75,000. The house is an asset appreciating about five per cent a year. Jan also has a mortgage of \$65,000. The mortgage is a liability. When the *HAMac* figures out Jan's net worth, it subtracts all liabilities from assets and comes up with a "net" amount. The third category associated with this asset is the interest paid on the loan. (A fourth might be the property taxes.) When each payment is entered, Jan selects *SPLIT* as the category and divides the amount of the payment between interest and principal as the amortization table she printed out indicates. The principal she assigns to the liability and *HAMac* reduces the amount of the liability. You can "project" the value or total amount of each category—in other words, do a budget.

HAMac lets you figure depreciation or appreciation for your assets. You can also identify each one as "tax" or "nontax" item. For example, most income is taxable. Food, an expense category, is usually not a taxable or tax deductible item. Later you may request a report of all "tax" items. All reports will indicate whether a transaction is a "tax" item or not.

Some people hate to budget, thinking it an unnecessary chore or even a restriction on their right of self-determination. But with *HAMac's* budget feature, all you need to do is "estimate" the amount of money you think you'll spend each

month in each category. *HAMac* then keeps track of how much money you do spend each month, your annual total to date, and how much you are "under" or "over" the estimates. No one need ever know, but a beautifully printed *HAMac* budget graph is terrific evidence when a member of the household has exceeded the budgeted amount for any category (or even for all categories).

WHAT'S YOUR PLEASURE?

People who use the *HAMac* will probably fall into one of two broad groups: Those who want the information to be very accurate (to the penny if possible), and those who are happy with a close estimate of their resources. Members of the first group probably balance their checkbooks every month; the second group leaves a little cushion in their checking accounts, "just in case."

If you want an exact record of all your financial resources, it will be necessary to do some planning on paper before you start entering transactions. The "rest of us" can jump right in. Let's look at the fast approach first.

CATEGORIES AS YOU GO!

Carolyn and Don Wilson want to keep a record of the checks they write. They'd like to know how much they spend every month on major categories like food, utilities, entertainment, etc. Basically they'd like to know where their money's going. They own a home and itemize deductions on federal tax forms. However, the taxes and interest are part of the monthly payment and the bank reports the totals at the end of the year. The main tax-deductible categories that the Wilsons need to keep track of are medical expenses and charitable contributions. The Wilsons have one checking account, one savings account, and an investment account. They would like an estimate of the total value of their assets.

HAMac users like the Wilsons can really jump right in and enter a starting balance for their personal checkbook (one of the default categories) and then begin entering checks and deposits to the account. Just add categories as you go. For

example, let's say the first check of the year was to the Corner Market for food. Type the name, "Corner Market," the amount, and the category "food."

When you click on *SAVE*, the *HAMac* will inform you that there is no such category. You then pull down the Lists menu and click *ADD CATEGORY* and type the information in. You'll assign this category to the expense group.

PLANNING AHEAD

The Wilsons will not get into any major difficulties with their "design as you go" system that grows like Topsey unless they get confused using an estimated financial record. Carolyn Wilson, for example, is happy to know that their financial worth is about \$250,000. Don, on the other hand, recognizes that a few mistakes in the system have made all of their totals a bit off and it bothers him. He decides mid-year to prepare an amortization table for his car loan and enters principal and interest as *SPLIT* transactions, assigning the principal payment to the liability category (Loan-auto) and the rest to Interest-Auto so that he can tell how much he still owes on the car from month to month.

REVISING RECORDS

HAMac is friendly about making revisions, so friendly it even features a category called Adjustment. Don can select adjustment in any category and then add or subtract from that category's balance. Another method is to select a transaction and simply change the amount, category, or other information. But, there is one problem—you can change or eliminate *SPLIT* transactions, but you cannot create a *SPLIT* category once a transaction has been saved.

Although the "create a category" as you go method works just fine in most cases, it is a good idea to enter all "starting balances" for each account before starting to enter transactions for a new year. Carolyn created the MasterCard category when she wanted to enter a payment check. Then she learned that she could not adjust the starting balance in a category after she had selected that category for a transaction. The

only way to make the total owed correct (bringing over the balance from the previous year) was to use the Adjustment Category.

BUDGETING

A "budget" is simply a projection or an estimate of either income or an expense. Click twice on a category to set up a budget with *HAMac*. The Wilsons used totals for various categories from the previous year to get started, dividing the totals by 12 and entering the average amounts for several categories such as electricity, heating, gasoline, telephone. For quarterly bills, they entered an amount for only the months they'd be billed. *HAMac* lets you be as exact as you need to be.

Once the information has been entered, go back to your checkbook and click SAVE (or press ENTER) and enter your next check.

Every month, the Wilsons can look under the Graph menu to see how their budget looks in comparison with their expenses.

The Wilsons will now have totals at the end of the year with respect to the categories they created on an "ad

hoc" basis. They have an estimate of their financial situation.

DID THE FREEZER SAVE MONEY?

HAMac can help you figure out specific information about costs or saving. In January 1985, the Wilsons bought a freezer. They knew it would be convenient but wondered if buying meats in large quantities on sale really saved them money. Using the 1984 food total (without the freezer), they entered the average monthly food bill as the budgeted amount. Then they used the *HAMac* customized graph feature to produce a graph showing their food budget only. In this case, the Wilsons were pleased to find that they actually spent less money on food in the year with the freezer.

PRECISE TO THE PENNY

John and Sally Marsh like to keep their checkbook balanced to the penny. They want to use their *HAMac* data to prepare their income tax. They'd like a financial statement accurate enough to use at a bank when they apply for a loan. The Marshes did some preplanning before they

entered the first transaction. They prepared a list of categories and subcategories "on paper" to match federal tax deduction categories, including Medical Expenses (Doctors, Transportation, Other), Taxes (State, Federal, Local), Real Estate, and so on.

THREE WAYS TO KEEP (ON) TRACK

The Marshes had three options available which would allow them to keep track of the total amount spent in subcategories. First, they considered using the "Memo." They could enter Taxes as the category and identify the subcategory by typing "State, Real Estate, General Sales," etc. beside "Memo." *HAMac* allowed the Marshes to prepare customized transaction reports searching by category and by memo. Of course, the use of the memo must be consistent (spelled exactly the same way) and since *HAMac* does not save lists of memos, the Marshes would need to prepare a list and save it outside of the computer.

While the Memo method was attractive, the Marshes rejected it when they discovered that SPLIT transactions did not permit them to enter a separate memo beside each item. If they tried to enter a mortgage payment or loan payment, the memo method would not work. In addition, the "accuracy" required was too taxing even for the Marshes. Any variety among memo entries would make this entire method invalid.

The second method considered by the Marshes was simply to enter each subcategory as a separate category, like Taxes—Federal, Taxes—State, and so on.

The *HAMac*'s 200-category limit (which includes all assets, income sources, charge accounts, bank accounts, liabilities and expense categories) could be restrictive, but the Marshes' paper list indicated that this was a viable option.

The third method for creating subcategories with *HAMac* required using ID codes, a two-letter code that can be used to identify special characteristics of a transaction. For example, the Marshes could create

(continued on page 114)

Starting Year	Save Monthly
1986	202.76
1987	264.39
1988	367.54
1989	574.49
1990	1,196.67

The "Future Value/Goal" option lets users painlessly calculate savings they'll need towards a future purchase.

Users have a choice of visual representations. Choose one or choose all, if you like.



THE STAR-STRUCK MAC

BY ROBB ALEY ALLAN

***Jumping Jupiter! Look,
up in the sky! Need to
know what's up there?
Here's a field guide to
Macintosh astronomy
programs.***

MICROCOMPUTERS HAVE LONG had a respected place in astronomy, from controlling telescopes for advanced amateurs to flying digital duty on the Space Shuttle. As far back as 1976, some adventurous NASA programmers were exploring ways to use kit-built micros to help interpret data from satellites such as LANDSAT.

For "the rest of us," however, astronomy software use has appeared only recently, no doubt spurred on in part by the arrival of

Comet Halley. Although the selection is still slim, the delay has allowed designers to ensure that most of the packages make good use of the Mac's capabilities. Several of them are of real value to skywatchers.

To be useful, certain fundamental features should be in any astronomy program. Plotting the positions of the planets and Moon according to user-specified times and locations is a must, with some limit to accuracy (all microcomputer astronomy programs must accept a certain degree of approximation to obtain a reasonable operating speed). Constellation mapping (drawing lines between appropriate stars to reveal the popular figures) and right ascension/declination (RA/dec) to altitude/azimuth (alt-azimuth) coordinate conversions are necessary, as is some indication of stellar magnitudes (see "Astro-Terms"). It is also helpful if objects can be identified by pointing and clicking on them.

Finally, the database of celestial objects should be reasonably "deep," certainly enough so that the major constellations are clearly revealed,

and so that it includes some "deep-sky" features such as the nebulae and clusters in the Messier catalog.

Predictably, not all astronomy software is created equal. Unlike spreadsheets and word processors, refined through years of competition, astro programs on the Mac (and elsewhere) differ greatly from one another in appearance and sheer utility. With so much software today available only by mail, there is a real risk of buying sight-unseen a program that falls short of one's needs.

ASTRONOMY

This program provides two viewing windows, one for the night sky and another for the solar system (Fig. 1). The time, date and viewing location in latitude and longitude are entered in a dialog box when the program first is booted, and can be changed later using a RESET option on the Control menu. After each change, both windows are recalculated in turn (if they are open).

Each window can be resized to fill the entire screen, or closed altogether. Another, more interesting, menu option permits "zooming" in or out

THE STAR-STRUCK MAC

Fig. 1: *Astronomy's* overhead Sky View is jumbled by overlapping text and hyphenated stars.

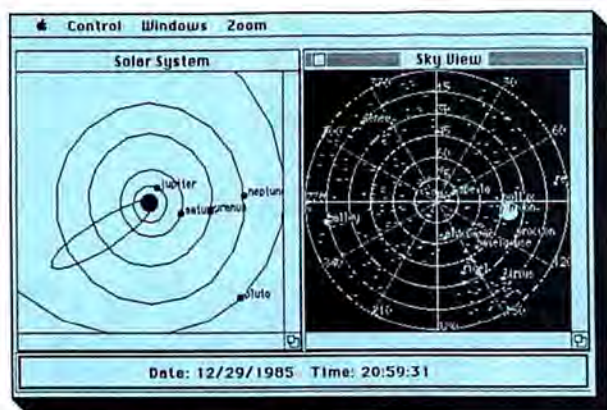


Fig. 2: The sky plot from *MacStrometry*, with Moon diagram, parameter box and neighboring change boxes. (Note Comet Halley above Jupiter.)



on selected spots, thus enlarging or shrinking the viewing area by about 150% and placing the selected spot at the center of the window. (A REPOSITION option only recenters the viewing area.)

The "Solar System" window draws a polar, or overhead, view of the Sun and planets, with orbits indicated by ellipses. Because of the enormous scale of our system, only planets from Jupiter and beyond are plotted initially; zooming in towards the Sun reveals the inner bodies.

In the "Sky View" window, a circular plotting area representing the night sky shows the more important stars of the major constellations, along with the visible planets, Sun, Moon, and, naturally, Comet Halley. Labels appear next to the prominent stars and planets. A polar grid showing altitude and azimuth overlays the plotting area; star positions change relative to the grid according to the date and viewing location. Unfortunately, the grid is inverted compared to the sky: east is shown to the right, whereas when looking overhead, it lies to the left.

This, astonishingly, stands as the sum total of *Astronomy's* capabilities. Some of the basic requirements for any useful astronomy program are simply lacking: right ascension and declination information, horizon views, and constellation mapping, to name a few.

Further, those features that are present have surprising limitations: recalculation of the sky plot after changing the date takes quite a long time (about 3 minutes); zooming in too far reveals empty space devoid of any celestial object or gridline (fainter stars do not appear); while zooming continually outward compresses the entire known universe into a chaotic point. Worse, zooming in only lengthens the recalculation time for that window, even if the result displays nothing at all.

The plotting method of the Sky View window is also less than ideal: most stars are drawn as hyphens, and planet and starnames frequently overlap. And although closing the Solar System window speeds up the redisplay of the Sky View plot by eliminating planetary calculations,

Astronomy's disk-based manual warns that it does not prevent the obvious error that can result: changing time or place with a closed Solar System window will properly redraw stellar positions but not planetary ones, causing erroneous plots.

All in all, despite some interesting and unique features, *Astronomy*—at least version 2.8—appears to be more of an experiment in translating spherical astronomy formulae into computer graphics than a useful program for amateur observers or armchair astronomers.

MACSTROMETRY

MacStrometry provides much more functionality than *Astronomy*. The program uses three displays—a circular overhead sky view (Fig. 2), a polar view of the solar system with a zooming feature similar to *Astronomy's*, and a separate Description window that shows basic textual data on each item in the program's database.

Both the overhead Sky plot and the Planet solar system view have adjacent boxes indicating basic viewing parameters such as date, time and location. These parameters can be changed by clicking them and then clicking in a row of small adjustment boxes that appear, somewhat akin to changing the Mac's internal clock with the Control Panel. Any such adjustment causes the sky map to sprout a DISPLAY button as a warning that the current sky view is not synchronized with the parameter box.

A variety of features are offered, among them astronomic symbols (Υ , Ψ , Φ) in the sky plot, a moon phase diagram in one corner of the display, a compass rose in another corner, optional constellation mapping, and "point-and-click" identification. A single click on any spot causes a box to appear with its coordinates; a double click brings up the coordinates as well as the object's name and a DESCRIBE button that, when pressed, jumps to the Description window to show the pertinent info from the database.

To locate a specific object, a menu option called FIND can be used in conjunction with the Description window to display the reference.

Fig. 3: Comet Halley traces the famous object across the sky, and provides a wealth of viewing tips for observers.



This can then be "accepted" to return to the Sky Data window with the object's coordinates in the identification box. Now, clicking on the identification box will cause the object to blink in the sky view.

It's possible to fix the plotting area, either to a RA/dec. spot or to an alt-azimuth one, so that changing the viewing parameters lets you either follow a part of the sky around, or always face in one direction. Further, the amount of sky displayed (and, thus, the scale of the view) can be changed by varying the view "diameter."

One criticism relates to the com-

pass rose: although properly oriented (cast to the left) when facing south and looking overhead, the rose does not change its angle when the sky plot is revolved using different alt-azimuth settings. In addition, because the plot area is always circular, there is no indication of the "real" horizon; you are not always sure of whether you can actually see what the program seems to show.

MacStromy's most unusual feature is a user-editable database of celestial objects (as many as 3,000 objects are allowed). The program's basic data are saved in MacWrite text files with the relevant formats de-

scribed in the manual, so users can add or alter object information—even planetary symbols. The program will automatically convert the modified file to the necessary internal format for use in plotting.

COMET HALLEY

Great Wave Software—distributor of *ConcertWare+*—markets this program, which is not a general astronomy package, but rather focuses on providing a wealth of useful information for observing the 1985–1986 apparition of the most famous of all periodic comets. As such, it performs excellently.

Once given a viewing date, time zone and latitude, *Comet Halley* generates a square window of the evening sky, showing Halley's estimated location (Fig. 3). Various options include moving the comet forward or backward a day, tracing its path with small circles, overlaying a RA/dec. grid, adding constellation names and mapping, etc. Most striking is the program's ability to automatically advance the comet's daily position forward or backward at one second intervals, thus giving the illusion of motion.

ASTRO TERMS

Making sense of astro-programs for the Macintosh requires familiarity with the basic terminology. Some of the following terms may be helpful:

Alt-azimuth: the coordinate system using azimuth and elevation as its basis.

Azimuth: the distance in degrees along the horizon from geographic north (or south, depending on the authority). For example, due east equals 90° (or 270°).

Declination: similar to latitude, a measurement of the north/south location of an object in the sky. Measured from the celestial equator, an imaginary plane drawn outwards from the Earth's equator.

Ecliptic: the apparent path of the sun through the celestial sphere, tilted from the celestial equator by about 23.5° and caused by the earth's own tilt with respect to its motion around the sun.

Elevation, altitude: the distance

above the horizon of an object, in degrees (e.g., directly overhead equals 90°).

Equatorial: the projection of the earth's equator onto the celestial sphere.

Julian date: the number of a given date, measured in a sequence from noon on January 1, 4713 B.C. Thus noon on January 1, 1985 starts Julian day 2,446,067.0.

Magnitude: the brightness of a celestial object, with 0 magnitude being very bright and 6 being very dim. Each higher number is about 2.5 times fainter than the previous.

Messier catalogue: 110 permanent "deep-sky" objects listed begun by Charles Messier in 1784, to distinguish them from comets he was hunting.

Precession: the extremely slow (26,000 year) wobble of the earth on its axis.

Right ascension: similar to longitude, a coordinate system for mea-

suring the east/west location of an object in the sky. Uses hours/minutes/seconds rather than degrees, so 24 hrs. equals 360° and 1 hour equals 15°. The zero point is the vernal equinox, where the sun is located in the sky on the first day of spring.

Sidereal time: "star time". If one side of the Earth always faced the Sun, it would always be midnight on the dark side, and no solar days would pass. But in the course of a year, as the Earth circles the Sun once, it would revolve once with respect to the stars—a sidereal day. There are approximately 365 solar days and 366 sidereal days in a given year.

View parameters: the data necessary to compute the positions of celestial objects as seen from a specific location on a certain date: day, time, latitude, longitude, etc.

Zenith: the point directly overhead from a given location.

THE STAR-STRUCK MAC

Program	Astronomy	MacStromy	Comet Halley	TellStar
Source of data	?	Sky Catalogue 2000.0	?	Skalnate Pleso, Sky Catalogue 2000.0, etc.
Minimum-maximum dates	none 0-3000 AD	2000 AD \pm 50 yrs.		8/85 to 7/86
Maximum no. of objects	?	\pm 3000	constellations	?
Star magnitudes	3.0? 5.0	4.0, constellations		constellations
Language	?	Lisa Pascal	Megamax C	MS-BASIC
Author	Ed Tomaszewski	Stan Nolte	Chris & Tina Galfio	Evan Scharf
System configuration	512K	128K, 512K, XL	128K, 512K, XL	512K, XL
Version	2.8	1.1b	?	1.00
Manual	11 pp. (disk-based)	54 pp.	5 pp.	51 pp.

In addition, several menu choices open windows with a variety of textual and graphic information: Moon Info, Comet Halley Position, Viewing Tips, Viewing Instruments, and—most important—a Horizon Window showing the comet's height in the sky. Using this information, a novice or beginning amateur observer can get out into the field and without much practice see Halley wend its sinuous way through the heavens.

TELLSTAR I & II

TellStar has a long and respected history: versions have existed for various microcomputers (originally the Apple II) since its development in 1980. It is thus no surprise to find that it stands as the most sophisticated astronomy package available for the Mac.

After some fancy opening graphics and a request for the necessary date and location, *TellStar* presents a list of calculations as it performs them. This takes about 2 minutes (while the cursor becomes an hourglass).

Once completed, however, the program runs at a very good clip, faster than any of the other packages save the more limited *Comet Halley*—an astonishing feat, since it is written in BASIC. (Because Microsoft BASIC for the Mac is an interpretive rather than compiled language, *TellStar* for the Mac is somewhat slower than versions on the IBM PC and its clones.)

TellStar provides two alternative types of sky plots: a circular overhead view with the zenith in the center (Fig. 4) and square plots showing horizon views from the various points of the compass (Fig. 5). Each view shows a range of star symbols to indicate differences in magnitude. Switching back and forth is accomplished with an adjacent compass rose, using "radio buttons" at points corresponding to the desired views. (A check box selects the overhead projection.) Above the compass rose is a box listing the view parameters.

TellStar permits an easy form of point-and-click identification for

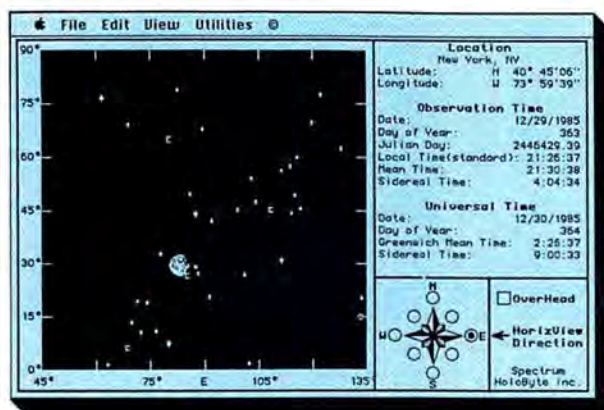
plotted objects. Within the plot area, the cursor becomes a small crosshair; centering on any object and clicking the mouse once fills the parameter box with pertinent information such as name, coordinates, magnitude and visibility. (If you forget where the object was originally or change the view, simply clicking in the parameter box will cause the object to blink.) Further, finding a specific object can be accomplished by using a menu command called FIND and entering its name into a dialogue box: the plot window automatically locates the object and places a blinking cursor on it. Planetary data can be placed in the parameter box by selecting an appropriate menu item and choosing from a box of radio buttons.

One criticism of *TellStar*'s sky views arises from the way it indicates constellations: besides optional mapping, each constellation is marked by a small lower case "c" adjacent to it. Unfortunately, this extraneous character confuses the sky display for experienced observers by interfering with the natural patterns of the constellations themselves.

Another minor problem concerns the compass rose next to the plot region. Where the sky plots show the correct orientation—east to the left and west to the right—the compass rose is reversed, with the cardinal points as they would appear on a standard geographical map.

The program comes in two versions: *TellStar I* covers only to the Northern Hemisphere's viewable universe, while *TellStar II* covers the entire sky and includes a complete

Fig. 4: The overhead window from *TellStar* shows stars with various magnitude symbols and constellations with small "c's."



For all of you who thought Dennis Brothers was crazy to give away MacTEP, here's MicroPhone.™

The one he's selling.

When the Macintosh first came out, the most powerful personal computer ever built didn't have the brains to make a phone call.

So Dennis Brothers tore down his Mac, figured out how it worked, and wrote Mac's first communications program, MacTEP.

Which he proceeded to give away.

MacTEP was a classic. The first standard in Mac communications.

Now he's created the second: MicroPhone. A program that goes far beyond any communications software currently offered for any computer.

MicroPhone is so sophisticated, it cuts through the worst tangles you encounter when you go on-line. A delight to the experienced. And a saviour for the novice.

Run on automatic.

When you open MicroPhone to the desktop you'll find a comprehensive collection of icons pre-programmed to access all major information services: CompuServe,® Dow Jones News/Retrieval,® The Source,™ Delphi,™ the works.

A few clicks and you're in. With automatic log-in and sign-on.

But that's just the beginning of its ability to automate the whole telecommunications process. For MicroPhone features the most powerful, yet simplest to set up macros ever seen on a program.

Write your own script.

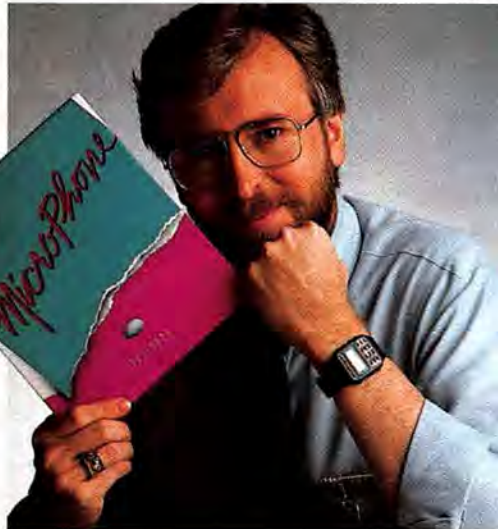
Dennis gives you two ways to create these macros. The first is to set MicroPhone in the Watch Me,™ the recording mode.

The program looks over your shoulder as you conduct a communications session following your keyboard and menu commands.

MicroPhone can remember not only an uninterrupted string of keyboard commands, but also wait-for-prompt conditions. In fact, virtually any series, no matter how long or complex.

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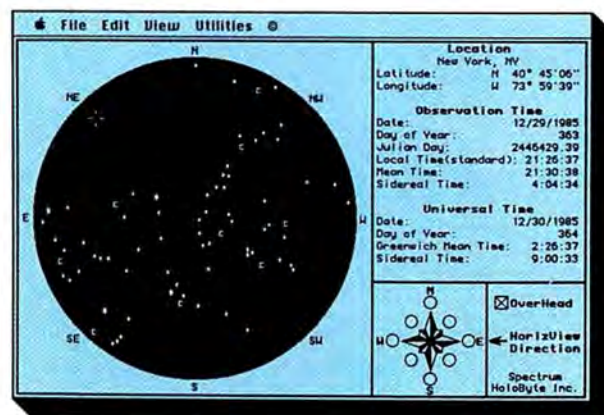


Fig. 5: TellStar's horizon view, looking east at the Moon (note the compass rose). A better choice for serious observers.

rather than partial Messier catalogue. Both versions offer several utilities—routines for: converting alt-azimuth coordinates to RA/dec.; equatorial coordinates to ecliptic; precession since the 1950 epoch (used by many star charts); and so forth.

WHAT'S IN THE STARS?

The Mac lends itself to superb graphical displays, and each of the packages reviewed here take advantage of that. On the other hand, each computes the necessary astronomical positions with limited precision, usually by eliminating such factors as

orbital perturbations for the planets, which affects calculations only in the far future or past.

Astronomy provides an unusual perspective on the solar system and can zoom around the sky; but beyond this there is little more to it. Its slowness and lack of other basic capabilities make it more of a demonstration program than a utility.

MacStrometry goes much further, containing many features useful and even educational to novice observers and students getting their first exposure to the field of astronomy. Particularly interesting is the expandable

database, which allows for customized sky displays. A new version due out shortly will be faster and perform more precise calculations.

Great Wave's *Comet Halley* is a real aid to anyone hunting the great comet for themselves, even when used alongside the wealth of Halley books and magazines. No other program presents as much information and detail on Halley as this one. Its "automatic" plotting mode brings to life the pace and path of the comet, better than any static chart.

Finally, overall, *TellStar* stands as the best of the lot for general observing use, by providing a set of routines of real utility as well as versatile and revealing sky plots. It has the best manual of all the programs, not only describing the operation of the program, but providing an astronomical glossary and several tables listing the locations of dozens of prominent stars and Messier objects. This would be my first choice to help plan an evening's observing session out in the field.

Now, speaking of "out in the field," if we could find a way to shrink the Mac to pocket size.

REPORT CARDS

ASTRONOMY v. 2.8

Overall Rating: ●●
Follows Mac Interface: ●●●
Printed Documentation: None
On-Screen Help: None
Performance: ●●
Support: ?
Consumer Value: ●

Comments: Slow and limited.
Best feature: Zoom in or out of the sky plot.

Worst feature: Lack of right ascension/declination coordinates.
List price: \$35.

Published by E & M Software Co., 95 Richardson Rd., N. Chelmsford, MA 01863. (617) 251-7451.

TELLSTAR I & II

Overall Rating: ●●●●●
Follows Mac Interface: ●●●●●
Printed Documentation: ●●●●●
On-Screen Help: None
Performance: ●●●●●
Support: ?

Consumer Value: ●●●●●

Comments: Strong, useful package for novices and intermediate amateurs.

Best feature: Quick sky plotting and horizon views.

Worst feature: Extraneous markers for constellations.

List price: \$49.94 (ver. I) and 79.95 (ver. II).

Published by Spectrum HoloByte, Inc., 1050 Walnut, #325, Boulder, CO 80302. (303) 443-0191.

MACSTROMETRY

Overall Rating: ●●●
Follows Mac Interface: ●●●
Printed Documentation: ●●●●●
On-Screen Help: None
Performance: ●●●
Support: ?
Consumer Value: ●●●

Comments: Good beginning astronomy program.

Best feature: Editable database

and plot symbols.

Worst feature: Using viewing parameters is overly complicated.

List price: \$75.

Published by Etalon Software, PO Box 649, Lafayette, CO 80026. (303) 665-3444.

COMET HALLEY

Overall Rating: ●●●●●
Follows Mac Interface: ●●●●●
Printed Documentation: ●●●
On-Screen Help: None
Performance: ●●●●●
Support: ?
Consumer Value: ●●●●●

Comments: Educational and useful aid for following Comet Halley.

Best feature: Automatic daily plotting.

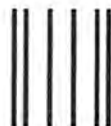
Worst feature: Limited lifetime.
List price: \$29.95.

Published by Great Wave Software, PO Box 5847, Stanford, CA 94305. (415) 325-2202.

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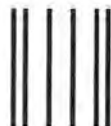


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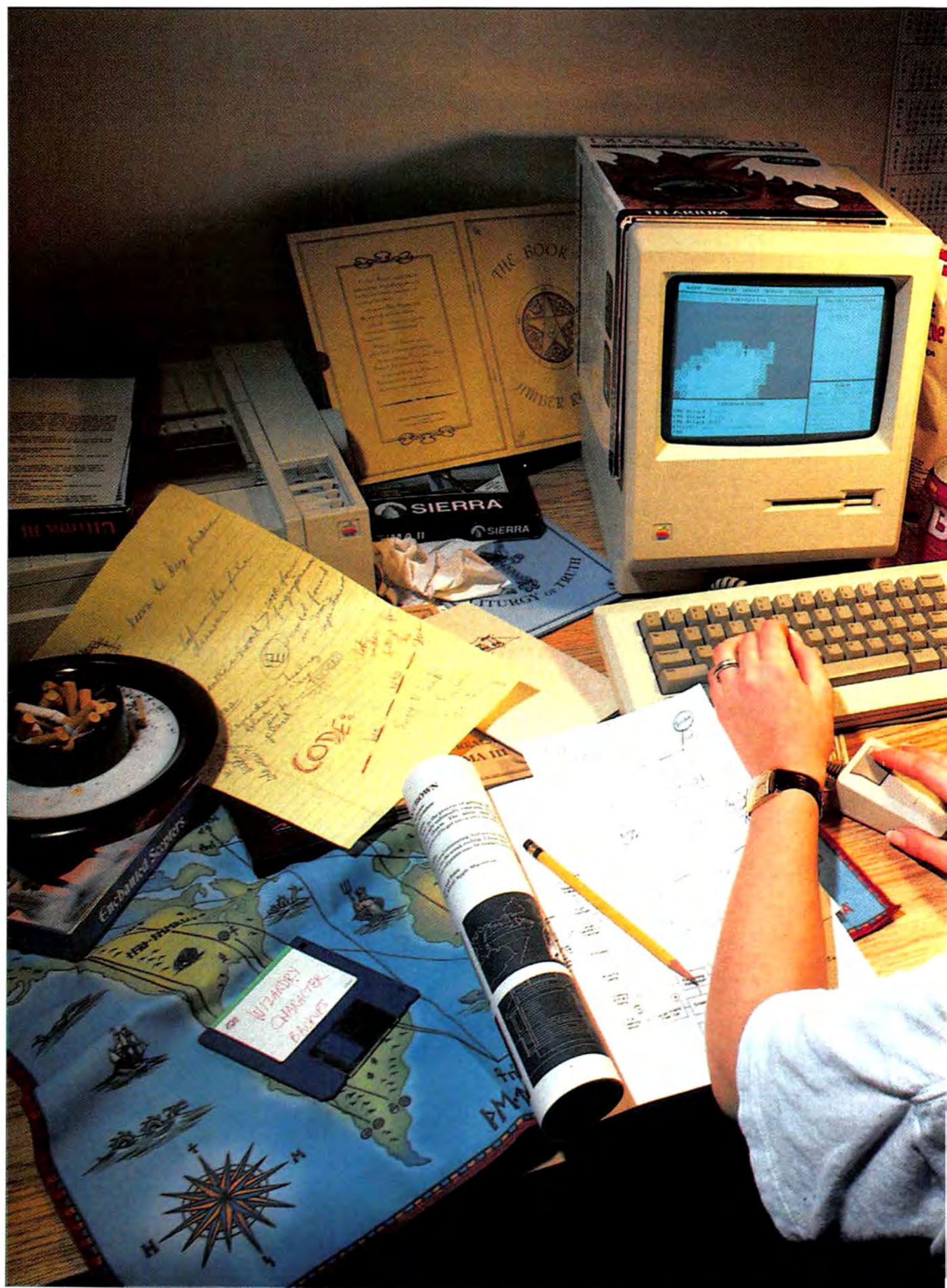
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THE CHEAT SHEET

Who Says, "You Only Cheat Yourself?"

I LOVE ADVENTURE GAMES. I stayed up past midnight for six solid weeks trying to beat the thief in *Zork I*; I agonized for weeks about where to find the "exotics" hinted at in *Ultima III*. I wouldn't put down my copy of *Rogue* until I had gotten to the twenty-sixth level, found the Amulet and clawed my way back out of the dungeon.

I've solved them all—*Wizardry*'s evil wizard cringes at the sight of me. *Ultima*'s Lord British seems to like me even though I always clean out his treasure room. My certificate of completion for *Deja Vu: A Nightmare Comes True*'s "Ace Harding School of Detectives" hangs in a place of honor above my desk. Single-minded? Maybe. Crazy? Absolutely. How do I do it? It's easy. I cheat.

Am I only cheating myself? Maybe. But then, most adventure games require at least a few months of undivided attention, and even the most sophisticated cheating can only pare down that time a little bit. Cheating in an adventure game is a little bit like peeking under the cards

ALEX QUESADA

By Tracie Forman Hines

THE CHEAT SHEET

while playing solitaire—except that solitaire only takes a few minutes to play, while the larger adventures can take nearly a year to complete. If you enjoy savoring every little triumph and defeat, stop reading now. But if you want to turn the odds to your favor as much as possible, read on for hints on how to get past your adventuring roadblocks—without resorting to *Fedit*, that is.

DOING IT THE MAC WAY

The Mac offers a feature not found on other gaming microcomputers, a boon to any adventurer who likes to walk the fence between carefully exploring every possibility and losing it all in total recklessness. This feature lets you enter any area, fight with any creature or test out any situation that strikes your fancy, all without the slightest possibility of permanently damaging the game in progress—even on an adventure like *Wizardry* that immediately writes your foolish moves to disk.

It's called a lockable disk.

When the little tab on a Mac disk is set to the up position, that disk can still perform as usual—except, of course, that it can't alter the existing files in any way. With games like *Rogue*, which immediately tally a player's death by erasing the game file, it's a great way to preserve a particularly good game.

Every piece of game software for the Mac includes the built-in COMMAND-SHIFT-1 "eject" function key. Just play with the locked disk, then, when you want to save the game, eject it, unlock it, and stick it back in the drive. The Mac might get a little confused and spit the disk back out, but it will immediately ask for it again.

A few games like *Wizardry* and *Rogue* update your file automatically as you play, even without a Save Game selection. If you've grown attached to the characters you nursed along from mere neophytes, locking your playing disk is the easiest way around this pesky quandry.

THE IMPORTANCE OF SAVING EARNESTLY

Whether your adventure preferences run to medieval fantasy or



Invisichecks are printed in invisible ink so you only have to see the answers you need right now.

high-finance money games, the most important edge you can give yourself is to save the game frequently—and preferably to different file names, if the program allows for it. That gives you the flexibility of being able to pick up the action at different points in time, often gaining insights without having to tough out the consequences.

For example, Blue Chip's financial games (*Millionaire*, *Baron*, *Tycoon* and *Squire*) create the entire course of commodity prices when players initiate a new game. If you play through six months of price fluctuations and end up losing your fortune in a bad deal, just go back to a file from the same game that you saved earlier and play out the time again. In these scenarios, forewarned is definitely forearmed!

The situation is reversed in *Make Millions*, although that doesn't mean you can't turn it to your advantage. In this high-finance role-playing game, world news—and therefore, stock prices—are generated randomly with each new round. That means that if you took a bath on Aloha Lumber the first time around, reverting to a game saved earlier could just change the course of history.

Some games take up so much disk space that it's hard to save more than one or two games at a time. In that case, just use the Finder to copy your game files to a backup. It may be more time-consuming than just locking the disk before playing, but it allows you more flexibility within each file, plus the reassurance that at

least one of your saved games is safely stashed out of harm's way. Copying files to backups is the surest way of holding on to the progress you worked so hard to achieve.

OPTIONS? YOU WANT OPTIONS?

Some adventures offer players different skill settings. Needless to say, if you play on the Novice level instead of the Advanced, the going will be much easier throughout the game—but it will take you far less time to solve the scenario. A few games, like Priority's *Forbidden Quest* and *Gateway*, even offer on-line hints, which save players the trouble of having to plough through logjams by the usual methods. Of course, using the hint option often means you'll lose a number of points corresponding to the difficulty of the hint, but it's an easy solution when there's no recourse left.

Sometimes, a game's difficulty settings can be used to familiarize yourself with a particular area or scenario of a game. For example, in Broderbund's *The Ancient Art of War*, you could try out each scenario with a trial run set to the easiest of the difficulty options—forests can be made sparse instead of dense, water can be calm and shallow as opposed to deep and dangerous, and so on. After cutting your teeth on the easiest settings, you'll have an idea of how to figure out the right strategies when the difficulty settings are set in their "natural" positions.

BEGGING AND BORROWING

If you belong to CompuServe, The Source, Plato or any other network, the answer to your adventure game quandry might be just a phone call away. Most networks have special sections devoted to games, or at least to light conversation, and a little time and patience might unearth someone with the knowledge you need.

Of course, there's no shame in calling the company for the solution to an impasse—as long as you don't expect them to play the entire game for you. Most game manufacturers list their telephone numbers on the box, or if you can't find it there, check the *MacUser* review for it.

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THE CHEAT SHEET

WHEN ALL ELSE FAILS

In response to a large demand from frustrated adventure game players, many companies sell hint booklets designed to ease people around problems that they can't seem to solve by themselves.

Infocom, creator of a number of classic text adventures (*Zork*, *Starcross*, *Hitchhiker's Guide to the Galaxy*) also markets the world's classiest hint booklets for its entire line of games. Called *Invisiclues*, each pamphlet consists of pages of questions, each followed by several blank spaces. Players who get stuck before they can enter a palace might look up the answer to "What do I give the troll to let me pass?" under the Palace section. Then, they pass an enclosed developing marker over the blank space under the question to be given a general clue. The second clue is more specific, and the third gives the outright answer. To keep adventurers from inadvertently learning more than they want to just by looking at the booklet, a number of dummy questions are sprinkled in for good measure.

Invisiclues are available directly from Infocom. Ordering details are enclosed in every game box, or call 1-800-262-6868 (in New Jersey, 800-238-2200). \$7.95 buys the clue book, ink developing pen and, in most cases, a complete map of the game area.

Solving the *Ultima III* quest involves more effort and strength of will than an Olympian decathlon. Origin Systems' hint booklet, *Secrets of Sosaria*, doesn't go so far as to give outright answers to anything, but it



Clockwise from the right: *Ultima III*'s hint book, *Secrets of Sosaria*; *Invisiclues* booklets for *A Mind Forever Voyaging* and *Hitchhiker's Guide to the Galaxy*; Arrays' book, *Adventure Games II*.

does provide exact maps of every town and dungeon in the known game world, including the locations of traps, treasures, important people and the dreaded dungeon gremlins. Each square in the vast terrain is printed out with different symbols representing different things (a living creature is a question mark; a town or village is a number symbol). It's a little pricey (\$12.95) for what you get, but the information and hints it contains are worth it in blood, sweat and tears. If your *Ultima III* game box doesn't include ordering information, contact Origin Systems at 340 Harvey Road, Manchester, NH 03103.

A number of other sources exist for adventure game players willing to pay for the answers to their questions. "QuestBusters" (see New On the Menu, *MacUser*, February 1986) is a newsletter devoted entirely to adventure game hobbying, with news, reviews and most importantly, tips for computer adventure game players. Write in with a problem and you just might get your solution,

although it will probably take awhile. A one-year subscription to "QuestBusters" costs \$15 a year. For information, contact "QuestBusters," 202 Elgin Court, Wayne, PA 19087.

As adventure gaming has expanded from a graveyard-shift techie's domain into the mainstream micro-computer audience, book manufacturers have jumped on the bandwagon. We can't recommend a specific title here—books go in and out of print, and as game trends change, the information in books goes out of date. Still, your local bookstore should have a large computer section, and hiding among all those programming tutorials and how-to-get-more-from-your-database manuals there will probably be at least one independently written book of adventure game hints. Before buying, though, make sure your game is included in the book by scanning the table of contents.

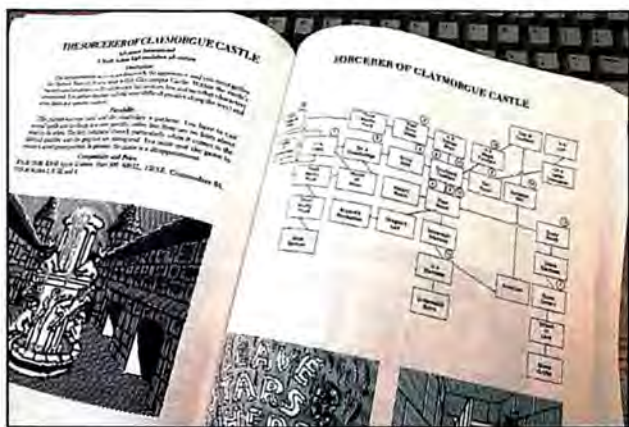
CHEAT-PROOF GAMES

Not all our cheat strategies work with each game, of course, but there are a few games in which nothing short of playing through carefully will suffice. Among them: Mindscape's *Deja Vu: A Nightmare Comes True*; Activision's *Borrowed Time*; Mindscape's *Balance of Power*; Sierra's *Ultima II*; and others.

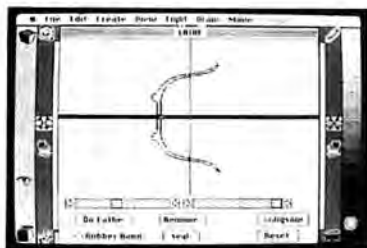
If locking files won't avail, if there are no clue books available, if the company won't talk to you and if you don't know what else to do, there are still a number of ways you can safeguard your game and still try

(continued from page 120)

Money talks. Here's a sample map from Arrays' *Adventure Games II*. The book also lists exact solutions to many text and illustrated adventures.



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DESIGNER BATTLES

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fight your Mac to a standstill.***

WAR AND LOVE ARE MANKIND'S GREATEST PASSIONS. While there's no computer game yet invented which can simulate the art of love, Broderbund's *The Ancient Art of War* is a realistic enough simulation of war to satisfy most people's combat urgings.

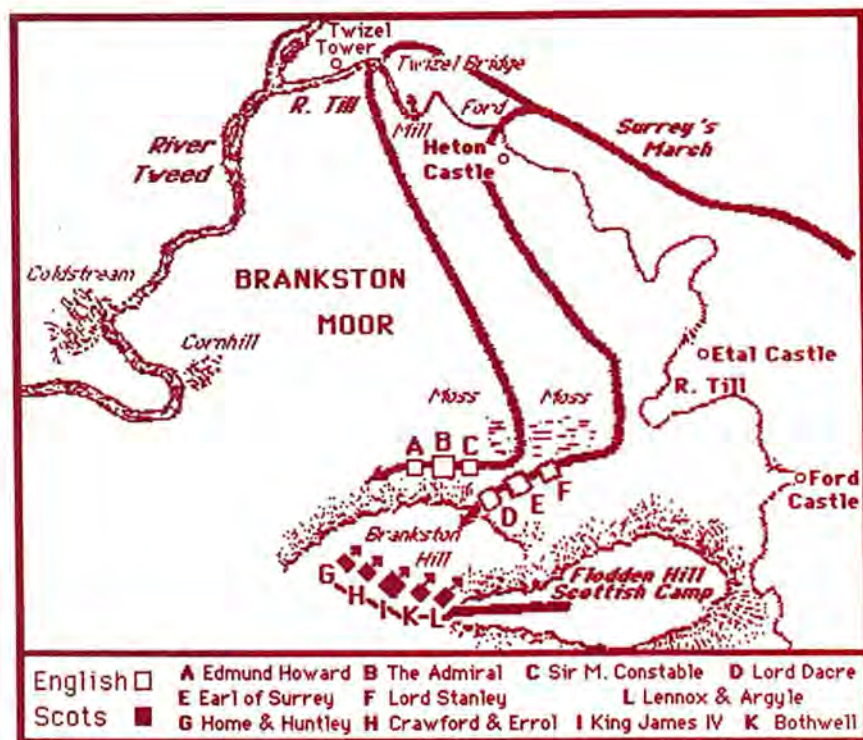
Though the game is not perfect, it does allow armchair generals to try their hands at both strategic and tactical levels. Some superb graphics and animation techniques make the on-screen happenings far more believable and personally involving than the hex-gridded fields and silhouetted symbols normally associated with computer wargaming.

The disk arrives with 11 scenarios that simulate battles which could have taken place in settings from the Old West to ancient China. It is also possible to simulate your own battles. In fact, once you have played and mastered the included scenarios, the staying power of this disk lies in accepting the challenge of making your own maps, creating new formations, and designing your own battles to fight. But before you can be a battle designer, you'll have to learn the basic system of *The Ancient Art of War*.

Each scenario is played on a scrolling map that can feature many different types of terrain. Hills, mountains, rivers and

BY NEIL L. SHAPIRO

DESIGNER BATTLES



The Flodden Hill scenario map.

lakes, forests, villages and forts may all have their own effects on a battle fought by the various troops.

The troops available include knights, barbarians, archers and spies. Each of these troops has various strengths and weaknesses. The knight is the most heavily armored, and so is best against unarmed barbarians. The barbarian has no armor but is swift and agile, making him a difficult target for the archer. Archers fight best at long ranges, but tend to crumple easily in hand to hand fighting. The spy is defenseless but simulates pointmen or outriders that detect enemy movement further away than troops without a spy could hope to see.

The artwork used to represent these terrains and troops on the first, strategic, screen is very well executed. In order to achieve a feeling that the game is indeed based on the old, old tome "The Ancient Art of War" (written in about 400 BC in China), the artwork has been rendered in a style very reminiscent of venerable Oriental woodcuts. This type of artwork seems peculiarly suited for the Mac's high-resolution black and white graphics.

Each squad of troops is represented on-screen by a silhouette of a warrior. This silhouette may be clicked on and then a line of march ordered for it by dragging a symbol with the mouse. The squad so ordered will begin moving across the map.

Each squad may be composed of units (up to fourteen individual troops) representing any combination of the four styles of soldiery. Double-clicking on a squad symbol presents a dialog box which shows the present makeup of the squad, its overall physical condition and level of supply. This dialog box also shows the squad's present speed of marching and a Speed Button that allows the player to change the speed of movement at any time.

As the unit crosses the various terrain at various speeds, the squad's condition and food supply changes. And these conditions can be critical during combat.

But before combat is even initiated, the same dialog box also allows the individual soldiers within the squad to be arrayed in one of nine pre-defined formations. The formations include Phalanx and Forward,

Wedge and Wave. A view from the top down (rather like a football diagram) shows how the squad's various units will align with each other given the chosen formation.

Meanwhile, the computer is giving marching orders to its own squads. Eight different computer opponents, from Crazy Ivan through Napoleon to the honorable general Sun Tzu (author of the original "Ancient Art of War" book), can give you various levels of challenge to face.

When opposing squads march within battle range of one another—the game suddenly takes on a whole new dimension.

ZOOMING IN ON VALOR

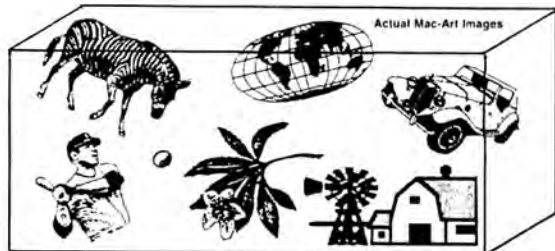
Two squads in opposition begin to flash. The player may then hit the Zoom Button atop the strategic map screen. When that button is clicked the screen clears to an astoundingly detailed tactical display of the battle in progress.

Every soldier in both squads is shown in close up, mock three-dimensional animation. Knights, hunched under the weight of their armor, ready their swords; muscular barbarians clench brawny fists; and the archers draw back on their bows.

Buttons atop the tactical display allow the player to issue orders to the complete squad or to individual soldier-types. Clicking on the Forward button sends the whole squad marching forward. But it is also possible, by highlighting smaller "radio" buttons, to do such things as send only your barbarians forward and have your archers back off.

Battles are won or lost depending on the orders given here as well as the strengths and conditions of the men and the style of formations opposing one another. It never, for example, makes sense to move your archers forward into hand to hand fighting. It is also necessary to understand the difference between the Forward and Attack commands. When issued an Attack order a loose formation will begin to coalesce, making it more massive and harder to stop but an easier target for archers. Many such tactical considerations become more obvious as more

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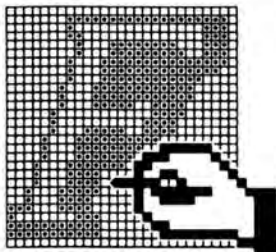
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DESIGNER BATTLES

and more campaigns are played.

The actual battles are almost eerie to watch. Swords swinging, the knights march fearlessly into battle. Fists flying, barbarians wreak amazing havoc with bare hands. Arrows fly through the air like deadly porcupine quills. All of this action takes place with very realistic sound effects that are unbelievably true to life. Every arrow has a *twang* all its own, every fistfall a *clunk*, every sword a *whooshing* swing.

Some will certainly find the tactical display almost too detailed. As men are hit they fly a few feet in the air, their eyes widen in shock, and they crumple to the ground as broken casualties. After a few moments of combat the on-screen battlefield is sure to look very much like a real one.

But, though the blood and gore are more realistically portrayed than in most games, so are the qualities of valor, courage and heroism. I have personally watched, cheering out loud, as one lone barbarian courageously charged a line of archers which had turned all his comrades into so much electronic chaff. Arrows flew about him like avatars of death and still he advanced. Reaching the line of archers his mighty fists dispatched a first hapless warrior. Then, like a combination of Conan and John Wayne, this little 3D image moved his way like a grim reaper down the entire line.

When finally this hero raised his arm in the salute of the victor, mounded about by the cold, broken flesh of his adversaries, it was all I could do to stop from screaming, "You did it! You did it!"

This movie-like animation is carried through on all of the tactical screens. Whether you're watching a fort (rather like a castle) being besieged, with arrows flying up and down from the battlements; squads fighting their way across a bridge or through a village square—this feeling of participation in events is the highest I have yet witnessed, or felt, in any game.

DESIGNING A CAMPAIGN

Well, as I did almost nothing else for two weeks than play the included

scenarios, I reached a point where I could win all of the battles on the disk. I then began to experiment with the "Game Generator" part of the program. I quickly realized that this part of the program could make

The Ancient Art of War that rarest of disks—the type that you keep booting up year after year.

The first few battles I designed were random affairs just to get the
(continued on page 118)

MAKING MULTIPLE-CAMPAIGN DISKS

Editor's Note: If you and a friend both create scenarios—or you download various scenarios or find them via your own user group—they must usually be played on separate disks. For those comfortable with FEDIT, MacTools or other disk utility programs here is a way to collate campaigns designed by more than one person all onto one disk.

When you create an *Ancient Art of War* campaign disk, the game generator creates two types of files.

The first is the file describing the scenario, numbered and titled in sequential order from "T0" thru "TB." That's hexadecimal numbering for "T1" through "T12." But it only allows eleven scenarios to be alive at one time. That's all the program has menu space for.

It also creates a file called "Titles." The "Titles" file is where the program crossreferences the "T" numbers to the scenario name.

Using the Finder, it's easy to rename the "T" file to another number. But to edit the "Titles" file requires a file editor such as FEDIT.

Since you don't have to create the "Titles" file, you can simply edit what you find in it. At minimum the file will have one entry, that will be the first "T" number in sequence. In this case, "T0." When adding a scenario to the disk, pick the next "T" number in sequence that does not have a title associated with it, in this case "T1."

If you look at the "Titles" file that comes with the scenario "Flodden Field," this is what you will find:

(ASCII)	(HEX)
T0.T1.T2.T3.T4.T	5430 0054 3100 5432 0054 3300 5434 0054
6.T7.T8.T9.TA.TB	3600 5437 0054 3800 5439 0054 4100 5442
.T5..Flodden Field	0054 3500 1846 6C6F 6464 656E 2046 6965
Id -- 1513 AD...	6C64 202D 2D20 3135 3133 2041 4400 0000
.....	0000 0000 0000 0000 0000 0000 0000 0000
.....	0000 0000 0000 0000 0000 0000 0000 0000
.....	0000 0000 0000 0000 0000 0000 0000 0000
.....	0000 0000 0000 0000 0000 0000 0000 0000

All but one of the periods in the ASCII translation are HEX code 00. The exception is the last character prior to the file name. The first file name begins at file position 37. Each succeeding file name will begin 60 characters later. In this case the "T0" file begins at position 37, the "T1" file name will begin at position 97, "T2" at 157 and so on.

At the position just prior to the file name is a hexadecimal character defining the length of the file name. So, just before the "F" in "Flodden Field," you find a Hex "18." But when you count it up, the file name is not 18 characters long, but 24. All file names are six (6) characters longer than the hex number given.

For example, to combine two scenarios from MAUG's DL4 ("Flodden Field—1513 AD" and "The Battle of Zook's

Ford"), throw away the "Titles" file from "The Battle of Zook's Ford" and edit the "Titles" file from "Flodden Field."

Rename the "T0" file from "Zook's Ford" as "T1." Otherwise, when you copy it to the same disk as "Flodden Field," it will write over the "Flodden Field" scenario.

Then use FEDIT and open the "Titles" file from "Flodden Field" and add "Zook's Ford" to it. Go to sector 0 of the file and change position 96 to hex "19." Then, at position 97, select "ASCII Modify" in FEDIT and type "The Battle of Zook's Ford." Then write the sector back to the disk. That tells the system that there is a second scenario on the disk, its name, and the length of the name.

To add more scenarios, repeat the same technique.—Dennis Mitchell

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ROBERT WAMBSGANSS

ONE IF BY LAND, TWO IF BY "C"

***Listen my children and
you shall hear
... sounds and
music with
Mac and "C."***

***By
Bob
Perez***

IT'S A GIVEN THAT A GOOD Mac program has great graphics -- at least, it should. But what about sound? The Mac has one of the most sophisticated sound generators of any microcomputer on the market, yet many of its most popular programs are limited to the basic beeps and boops made by any machine. You can get great sound out of your Mac. And it's not even that hard.

Last month I presented a program that illustrated how you could incorporate *MacinTalk*, Apple's software speech synthesizer, into your own C programs. One of the reasons that Apple could get away with a software-only speech synthesizer is that the Mac sports some of the most sophisticated sound circuitry available on a personal computer. This month we keep to the audio theme and present an introduction to the Macintosh sound driver in the context of a complete Macintosh application. Our supplied program illustrates the concept of an event-driven environment as it tracks and handles the user's menu selections using both the mouse and the keyboard. A function that plays simple, easily altered tunes is provided in a format that can be easily transported into your own applications.

The Macintosh sound driver is built into ROM and consists of three independent "synthesizers": the Square-Wave Synthesizer (SWS), the Free-Form Synthesizer (FFS) and the Four-Tone Synthesizer (FTS).

The FFS is in many ways the most complex of the three and is used to produce the most lifelike sounds. You could, for example, produce the sort of voices that *MacinTalk* utters by competent use of this device. Game designers use this synthesizer to produce the explosions that sound when players fire their phasers at the aliens, taking advantage of the large, complex waveforms allowed by the FFS. The program in the listing demonstrates the use of the FFS to create some simple "white noise." You can alter the waveform in a number of interesting ways to achieve other effects, although you won't

ONE IF BY LAND, TWO IF BY C

find much in *Inside Macintosh* to guide you. The best bet here is to experiment and keep notes.

The SWS is the simplest of the three synthesizers and produces the same sort of single tone "beeps" that you hear when you click the mouse outside of a modal dialog box, for example. The listing contains a function called `swplay()` that accepts as

its sole parameter the address of an array containing the notes making up a tune. At the end of the listing is a sample array that is used to feed `swplay()`. Using the information contained in the Sound Manager section of *Inside Macintosh*, it's a simple matter to create your own tunes and incorporate `swplay()` into your own programs.

One of the things you'll notice when you consult the Sound Manager manual is that I didn't use the standard data structures. Why not? I find that in this case it's a bit tedious to have to fill in a bunch of predefined labels for each part of each note for an entire tune. Since each element in a `SWSynthRecord` is either an int or made up of ints, I

LISTING

```
/*
 * Sample application illustrating use of Macintosh sound routines using
 * Aztec C compiler (modifications required for use with other compilers).
 * Copyright 1986 by Bob Perez -- All Rights Reserved. Non Commercial
 * Use of the routines herein is permitted with Copyright notice intact.
 */
#include <quickdraw.h>
#include <window.h>
#include <menu.h>
#include <event.h>
#include <desk.h>
#include <pb.h>
#include <memory.h>
#include <init.h>
#include <sound.h>
#include <segment.h>

#define NIL 0L
#define noErr 0
#define FOREVER 1
#define APPLEMENU 1
#define FILEMENU 2
#define EDITMENU 3
#define OPTIONSMENU 4
#define NUMMENUS 4
#define FFSIZE 5120

MenuHandle mymenus[NUMMENUS];

struct ftune {
    short duration;
    long rate1;
    long phase1;
    long rate2;
    long phase2;
    long rate3;
    long phase3;
    long rate4;
    long phase4;
    char *wave1;
    char *wave2;
    char *wave3;
    char *wave4;
};

struct synthrec {
    short mode;
    struct ftune *sndRec;
};

struct freeform {
    short mode;
    long count;
    char fwave[FFSIZE];
} myff;

char wave[256];
ParmBlkPtr fpb1, fpb2, fpb3, spb, ffpb;
struct ftune *mytune1, *mytune2, *mytune3;
struct synthrec *myrec1, *myrec2, *myrec3;

main()
{
    /*
     * Set up everything.
     */
    init();

    /*
     * Fall into our event loop.
     */
    event();
}

/* end of main() */

/*
 * The init() function handles initialization of globals and structures, as
 * well as the usual Macintosh initialization of Managers.
 */
init()
{
    register unsigned short h, i, j;
    char apptitle[2];

    /*
     * Standard sequence to initialize all managers, clear event queue
     */
    InitGraf(&thePort);
    InitWindows();
    InitFonts();
    InitMenus();
    TELInit();
    InitDialogs(0L);
    FlushEvents(everyEvent, 0);
    InitCursor();

    /*
     * Set up the menu bar. Usually this would be done using resources and
     * GetMenu(). We've hard-coded it here for simplicity. The apptitle[]
     * array is a hack to get the $14 value (the little apple) into a pascal
     * string (as expected by NewMenu) for the menu bar. Note Aztec C's use
     * of the \P prefix to denote pascal strings. Use a CToPStr() function
     * with Consulair or other compilers.
     */
    apptitle[0] = 1; /* length byte of the pascal string */
    apptitle[1] = appleMark;
    mymenus[0] = NewMenu(APPLEMENU, apptitle);
    AppendMenu(mymenus[0], "\PBeep Beep; (-");
    AddResMenu(mymenus[0], "DRVr"); /* This adds all desk accessories to menu */

    /*
     * File menu will have only a 'Quit' option.
     */
    mymenus[1] = NewMenu(FILEMENU, "\PFile");
    AppendMenu(mymenus[1], "\PQuit/Q");

    /*
     * Standard edit menu (intended here only for desk accessory support)
     */
    mymenus[2] = NewMenu(EDITMENU, "\PEdit");
    AppendMenu(mymenus[2], "\PUndo/Z; (-; Cut/X; Copy/C; Paste/V; Clear");

    /*
     * Our Options menu offers a choice of Square Wave, Four-Tone, or
     * Free Form synthesizer. The last option cancels any sound in progress.
     */
    mymenus[3] = NewMenu(OPTIONSMENU, "\POptions");
    AppendMenu(mymenus[3], "\PPlay a Square Wave Tune/S");
    AppendMenu(mymenus[3], "\PPlay a Four Tone Chord/F");
    AppendMenu(mymenus[3], "\PPlay a Free Form Noise/M; (-; Halt Sound/H");

    /*
     * Insert the defined menus into our menubar, then draw the menubar.
     */
    for (i = 0; i < NUMMENUS; ++i)
        InsertMenu(mymenus[i], 0);
    DrawMenuBar();

    /*
     * Set up a simple, triangular wave shape form for Four Tone Synthesizer
     */
    for (i = 0, h = 128, j = 0; i < 64; ++i, h -= 2)
        wave[j++] = (Byte)h;

    for (i = 0, h = 255; i < 128; ++i, h -= 2)
```


found it much easier to create a single array of ints made up of all the values necessary to create a tune and then pass this array to the sound driver as though it were a SWSynthRecord structure.

This illustrates a point about C structures, by the way. When you've got a struct made up of ints or longs, each successive member follows the

preceding member directly in memory. To use the SWSynthRecord as an example (see page 7 of the Sound Manager manual), the "count" member appears in memory directly after the "mode" member. This is so even though "count" is a member itself of yet another structure contained within SWSynthRecord; structs do not take up any memory at all them-

selves—only their elements occupy space. To improve readability you can indent at your pleasure (as I have done) when you initialize an array that's substituting for a struct. In my example, I start off with the 'mode' value, then follow with a series of groups of 3 ints, representing the "count," "amplitude," and "duration" fields in the "triplets" struc-

```

wave[j++] = (Byte)h;

for (i = 0, h = 0; i < 64; ++i, h += 2)
    wave[j++] = (Byte)h;

/*
 * Now, create a random Free Form wave, using the randfrom() function. The
 * waveform we create generates simple white noise. You can diddle with
 * the waveform to create more interesting effects. An increasingly narrow
 * range of random notes along the waveform will create decaying white
 * noise, for example.
 */
for (i = 0, j = 255; i < FFSIZE; ++i)
    myff.fwave[i] = randfrom(1, j);

/*
 * Initialize our pointers and allocate storage for our parameter blocks
 * and synthesizer records. Then, initialize the various sound records.
 */
fpb1 = (ParamBlkPtr)NewPtr((long)sizeof(struct ParamBlkRec));
fpb2 = (ParamBlkPtr)NewPtr((long)sizeof(struct ParamBlkRec));
fpb3 = (ParamBlkPtr)NewPtr((long)sizeof(struct ParamBlkRec));
spb = (ParamBlkPtr)NewPtr((long)sizeof(struct ParamBlkRec));
ffpb = (ParamBlkPtr)NewPtr((long)sizeof(struct freeform));
mytune1 = (struct ftune *)NewPtr((long)sizeof(struct ftune));
mytune2 = (struct ftune *)NewPtr((long)sizeof(struct ftune));
mytune3 = (struct ftune *)NewPtr((long)sizeof(struct ftune));
myrec1 = (struct synthrec *)NewPtr((long)sizeof(struct synthrec));
myrec2 = (struct synthrec *)NewPtr((long)sizeof(struct synthrec));
myrec3 = (struct synthrec *)NewPtr((long)sizeof(struct synthrec));

/*
 * These rate values produce a C major Chord per the Sound Manager manual
 * of Inside Macintosh, pp 20-22. Four Tone Synthesizer.
 */
mytune1->rate1 = 0x3025D; /* Middle C */
mytune1->rate2 = 0x3CD97; /* E */
mytune1->rate3 = 0x4B241; /* G */
mytune1->rate4 = 0x604B9; /* C */

/*
 * These rate values produce a simple interval for demonstrating the phase
 * shifting effect. Four Tone Synthesizer.
 */
mytune2->rate1 = 0x33030; /* C# above middle C */
mytune2->rate2 = 0x33030;
mytune2->rate3 = 0x4C6DD; /* G# above middle C */
mytune2->rate4 = 0x4C6DD;

/*
 * These rate values produce a C minor chord. Four Tone Synthesizer.
 */
mytune3->rate1 = 0x3025D; /* Middle C */
mytune3->rate2 = 0x39430; /* D# */
mytune3->rate3 = 0x4B241; /* G */
mytune3->rate4 = 0x604B9; /* C */

/*
 * Standard phase values for the C chords. Four Tone Synthesizer.
 */
mytune1->phase1 = mytune3->phase1 = 0L;
mytune1->phase2 = mytune3->phase2 = 0L;
mytune1->phase3 = mytune3->phase3 = 0L;
mytune1->phase4 = mytune3->phase4 = 0L;

/*
 * Not so standard for the second tone. Playing around with phase values
 * creates interesting effects by causing the sound driver to start at a
 * point along the waveform other than the beginning (represented by
 * byte[0] of the wave array). For this second tone, we alter the phase
 * of the two simultaneously executing notes to illustrate "phase shift"-ing
 * This is a special effect commonly used in recording studios to give a
 * 'Jimi Hendrix' sound to electric guitars, etc. Four Tone Synthesizer.
 */
mytune2->phase1 = 193L;
mytune2->phase2 = 31L;
mytune2->phase3 = 63L;
mytune2->phase4 = 129L;

/*
 * For this example, all Four Tone waveforms are the same. You could
 * have different waveforms for each voice, if desired, and can even
 * change them in the middle of a tune. Four Tone Synthesizer.
 */
mytune1->wave1 = mytune1->wave2 = mytune1->wave3 = mytune1->wave4 = wave;
mytune2->wave1 = mytune2->wave2 = mytune2->wave3 = mytune2->wave4 = wave;
mytune3->wave1 = mytune3->wave2 = mytune3->wave3 = mytune3->wave4 = wave;

/*
 * Set up the synth records for the Four Tone Synthesizer.
 */
myrec1->mode = myrec2->mode = myrec3->mode = ftMode;
myrec1->sndRec = mytune1;
myrec2->sndRec = mytune2;
myrec3->sndRec = mytune3;

/*
 * Initialize the Free Form Synthesizer struct.
 */
myff.mode = ftMode;
myff.count = 0x604C;

/*
 * Clear the ioResult field of each parameter block so we don't have any
 * stray values in there that make it appear that sound's executing.
 */
spb->ioResult = fpb1->ioResult = fpb2->ioResult = fpb3->ioResult = 0;
ffpb->ioResult = 0;

} /* end of init() */

/*
 * The event loop, focal point of most Macintosh applications.
 */
event()
{
    EventRecord er;
    WindowPtr wptr;
    short wpart;

    /*
     * Set up an 'infinite' loop to process events
     */
    while (FOREVER) {
        /*
         * Call SystemTask for any desk accessories that might be active. Then,
         * use GetNextEvent to handle only our events.
         */
        SystemTask();
        if (!GetNextEvent(everyEvent, &er))
            continue;

        switch(er.what) {
            case mouseDown:
                /*
                 * Find out where the mouse was clicked.
                 */
                wpart = FindWindow(&er.where, &wptr);

                /*
                 * Now check wpart to see if the click was in a menu or in a desk
                 * accessory window. If in a menu, send the information off to
                 * do_menu() for processing.
                 */
                switch(wpart) {

```


ONE IF BY LAND, TWO IF BY C

ture. By referring to my copy of the Sound Manager manual, I can quickly and easily create new tunes.

Another thing you'll notice is that I didn't call StartSound(), StopSound(), or SoundDone() anywhere in the program. None of these routines appears in ROM even though they're documented in *Inside Macintosh*. Most of the better development

systems include their own versions of these high-level routines, and *Aztec C* is no exception. Some compilers, however (Consular's, for example), do not provide these routines and, in any case, writing your own version of such a routine provides you with a deeper understanding of the entire I/O process. Creating these routines from tools available

with any of the compilers also assures that you'll be able to compile and run the program. The Sound Manager manual contains all of the necessary information for you to be able to do this from C or assembly language.

The FTS is the most difficult of the three to program, but mastery of this synthesizer will mark you as a

SON OF LISTING

```
case inMenuBar:
    do_menu(MenuSelect(pass(er.where)));
    break;
case inSysWindow:
    SystemClick(&er, wptr); /* Go handle desk accessory click */
    break;
default:
    break;
}
break;

/*
 * The only keyDown events we handle are command key presses.
 */
case keyDown:
    if (er.modifiers & cmdKey)
        do_menu(MenuKey((char)er.message & charCodeMask));
    break;

/*
 * In case of other events coming through, dequeue them and continue.
 */
default:
    continue;
} /* end of main event switch */

} /* end of while(FOREVER) loop */

} /* end of event() */

do_menu(mresult)
unsigned long mresult;
{
    extern int swtune[], about[];
    register short theitem, themenu;
    short err;
    char name[256];

    themenu = mresult >> 16;
    theitem = mresult;

    switch(themenu) {
        case APPLEMENU:
            if (theitem < 3)
                swplay(&about[0]);
            else {
                /*
                 * The Desk Manager portion of Inside Macintosh details a method
                 * for sizing a desk accessory about to be opened. In real
                 * applications you'd use that method to insure enough memory
                 * available before attempting the open. Since Apple recommends
                 * that accessories not be any bigger than 8K, here we simply
                 * check for 8K available and if it's not there, we beep and
                 * ignore the open request.
                 */
                GetItem(my_menus[0], theitem, name);
                ResrvMem(8192L);
                if ((err = MemError()) == noErr)
                    OpenDeskAcc(name);
                else
                    SysBeep(3);
            }
            break;
        case FILEMENU:
            bye();
            break;
        case EDITMENU:
            SystemEdit(theitem - 1); /* Send edit item command to desk accessory */
            break;
        case OPTIONSMENU:
            switch(theitem) {
                case 1:
                    swplay(&swtune[0]); /* The Square Wave Synthesizer */
                    break;
                case 2:
                    fourplay(); /* The Four Tone Synthesizer */
                    break;
                case 3:
                    freeplay(); /* The Free Form Synthesizer */
                    break;
                case 5:
                    killio(); /* Kill the currently executing sound */
                    break;
                default:
                    break;
            }
            break;
        case 6:
            HlfiMenu(0);
    } /* end of do_menu() */

    /*
     * The function fourplay() calls turns on the Four Tone Synthesizer to play
     * one of two chords.
     */
    fourplay()
    {
        short which;
        ParamBlkPtr pb;
        struct ftune *mytune;
        struct synthrec *myrec;

        /*
         * Start by 'randomly' selecting the first or the second chord. Then,
         * initialize the pointers to point to the appropriate structures.
         */
        which = ranfrom(1,3);
        switch(which) {
            case 1:
                pb = fpb1;
                mytune = mytune1;
                myrec = myrec1;
                break;
            case 2:
                pb = fpb2;
                mytune = mytune2;
                myrec = myrec2;
                break;
            case 3:
                pb = fpb3;
                mytune = mytune3;
                myrec = myrec3;
                break;
        }

        /*
         * Set up the param block. Since we're only using one buffer for each
         * chord, we won't allow queuing of requests. If the particular chord to
         * be played is already executing, we'll return without activating a new
         * request to write. This isn't a problem in real applications where
         * you've typically got separate buffers for separate write requests.
         * In such cases, having separate buffers allows you to modify one while
         * the other's being written, thus avoiding a staccato effect each time a
         * new tone is sounded.
         */
        if (pb->ioResult > 0)
            return;
    }
}
```


true Mac sound pro. There's no limit to the intricate four-part harmonies you can conjure up with this one, so it's no surprise that most of the music programs on the market utilize the FTS. The sample program demonstrates a simple chord generation and phase shifting experiment. Play around with the values using *Inside Macintosh* as your reference

point and read my comments in the listing.

SOME GENERAL COMMENTS

Note the use of register variables in the program. Most compilers that provide register variables only allocate a few (*Aztec* provides four data and two address), so be judicious in your use of these turbo-variables.

Whenever you've got a loop that counts down a variable, a register variable should generally be used. Also, note my placement of the register declarations. Since a register declaration is really just a "hint" to the compiler and will only result in an actual register allocation if a register is available, prioritize multiple register declarations so that the ones

```
/*
 * These structures are used in Aztec C to emulate the pascal IO blocks
 * documented in the File Manager manual of Inside Macintosh. Other
 * compilers will vary somewhat. For example, Aztec uses unions whereas
 * Consulair uses separate structs for each type of IO block. The ultimate
 * field names are the same, however, and are identical to those documented
 *
 * in Inside Macintosh.
 */
pb->ioCompletion = NIL;
pb->u.ioRefNum = -4;
pb->u.ioBuffer = myrec;
pb->u.ioReqCount = (long)sizeof(struct synthrec);

/*
 * Set up the duration for this particular call by assigning a value based
 * on 60'ths of a second. In this example, the C chords last 1 1/2 seconds
 * while the phase shifting example lasts 5 seconds.
 */
mytune1->duration = 90;
mytune2->duration = 300;
mytune3->duration = 90;

/*
 * Now, write the buffer to the sound driver with an asynchronous call
 */
PBWrite(pb, TRUE);

} /* end of fourplay() */

swplay(thetune)
int *thetune;
{
/*
 * Set up the parameter block for the square wave call. Note that we pass
 * an arbitrarily long value to the ioReqCount field since the sound driver
 * will stop outputting sound in any case when it gets to the 3 zeroes
 * at the end of the synth record. For this example, again, we won't
 * allow queueing requests. The synthrecord whose address is passed to
 * this function appears at the end of the listing in the form of an array
 * named swtune[]
 */
if (spb->ioResult > 0)
    return;

spb->ioCompletion = NIL;
spb->u.ioRefNum = -4;
spb->u.ioBuffer = thetune;
spb->u.ioReqCount = 100000L;

PBWrite(spb, TRUE);

} /* end of swplay() */

freeplay()
{
/*
 * Set up the parameter block for the Free Form call. For this example,
 * again, we won't allow queueing requests.
 */
if (ffpb->ioResult > 0)
    return;

ffpb->ioCompletion = NIL;
ffpb->u.ioRefNum = -4;
ffpb->u.ioBuffer = &myff;
ffpb->u.ioReqCount = (long)sizeof(struct freeform);

PBWrite(ffpb, TRUE);

} /* end of freeplay() */

} /* end of swplay() */

/*
 * The function killio() shuts off the sound driver after checking to see if
 * there's actually any sound being produced. As we did in both of the sound
 * functions, we poll the ioResult field to see if a write request is in
 * progress. This field will remain positive as long as a write request is
 * executing (i.e., sound is being produced).
 */
killio()
{
    if (fpb1->ioResult > 0)
        PBKillIO(fpb1, TRUE);
    if (fpb2->ioResult > 0)
        PBKillIO(fpb2, TRUE);
    if (fpb3->ioResult > 0)
        PBKillIO(fpb3, TRUE);
    if (spb->ioResult > 0)
        PBKillIO(spb, TRUE);
    if (ffpb->ioResult > 0)
        PBKillIO(ffpb, TRUE);
} /* end of killio() */

/*
 * ranfrom() returns a pseudo-random integer between two positive integers.
 * The function expects two positive integer arguments, low and high. The
 * returned integer should fall 'randomly' between low and high, inclusive.
 */
ranfrom(low, high)
register unsigned short low, high;
{
    register unsigned short range;

    range = high - low + 1;
    return(abs(Random()) % range + low);
} /* end of ranfrom() */

/*
 * abs() takes a signed integer and returns its absolute value. We've provided
 * it here since the Toolbox Random() function returns negative values as well
 * as positive. Some compilers offer this as a utility macro in stdio.h
 */
abs(num)
short num;
{
    return num < 0 ? -num : num;
} /* end of abs() */

/*
 * It's generally a good idea to have one function to handle program exits.
 * Many applications will contain more than one opportunity to exit.
 * By having each such location call a single exit function, you can avoid
 * duplication of exit clean-up code, as well as providing assurance of a
 * uniform exit approach in all cases.
 */
bye()
{
/*
 * Before we quit, we check to see if we left a tune playing. If so, we
 *
 * shut it off before exiting.
 */
killio();

/*
 * Dispose of allocated storage. This isn't actually required since upon
 * termination of our program all heap space used will be returned to the
 * available pool of memory. Still, remembering to deallocate memory that
 * you've specifically allocated is a good habit to get into and is done
 * here for illustration purposes. Eliminate these calls if you'd like.
 */
}
```


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you want the most are declared first. That way, if the compiler runs out of registers, you'll have your most important variables covered.

The sample program uses the ToolBox Random() function in a couple of places and I've included some utility functions to use with it. When I'm in the mood for random numbers I'm usually looking for an


integer between 1 and n, whereas the `ToolBox Random()` returns a signed integer between -32768 and 32767. To get around this, I've written the function `randfrom()` which takes two positive integers as input and returns a pseudo-random integer within the range encompassed by supplied integers. You just can't get true randomness from a

computer and most so-called random number generators are really pseudo-random. The effect is close enough for our purposes.

I've also provided an `abs()` function which simply returns the absolute value of a given integer. Using `abs()` within `randfrom()` assures that the numbers returned by `Random()` will all be positive. ☐

The MacServe Theory of Networking.


1+1>2



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TIP SHEET

Compiled by Tracie Forman Hines

Have you found an interesting way to get things done faster, more efficiently, or more creatively? Share your tips with The Rest of Us and get rich and famous besides by sending your hints in to MacUser Tips, 25 West 39th Street, New York, NY 10018. We'll pay you \$25 to \$100 for every tip we use, plus we'll print your name and home town in the magazine for all to see. What are you waiting for? Get out those programs and start hunting hints!


MACWRITE

 Do you create a lot of documents with specific page setup requirements? Save a lot of time and duplicated effort by creating a reusable template for each non-default page setup you use often. Once you've set the format for page size, starting font, margins, spacing and headers and footers, save it as an independent document named for the function you'll use it for (as in "Invoice Standard"). The next time you'll need to use that format, just open the document and type away. Remember to SAVE AS ... instead of just SAVE, though, which will create a new file for your letter without corrupting your original template. You can extend this idea even further to keep personalized letterheads on file as well.


 Those special icons in headers and footers, like the date, time and page number icons, don't change font and style unless they're highlighted. You can change the fonts and styles these items are displayed in relatively easily. One technique is to click at the very beginning of the header or footer window, then select the desired font and style from the Style menu.


Another way of changing a whole header or footer (including the icon-driven items) is to first be sure the header ends with a carriage return. Then click at the end, move to the beginning, and press SHIFT while clicking the mouse button. Now, change to your heart's desire.

You can even mix fonts and font styles between icon-driven and text entries in each window by following the first procedure above, then typing a space before setting the text's font and style. Although different bits of text in a header or footer can be displayed (and printed) in different fonts, the text produced by the icons all share the same fonts and style.


 While you can't place text next to pictures in MacWrite, you can move the special icons in the header and footer windows on top of any pasted graphics. The text these icons create will appear on your images.

FONT/DA MOVER

 When using the Font/DA Mover, most people hit the OPEN button to access the system of another disk. If you stick a disk into the drive while the Font/DA Mover is open, it automatically opens the system of the disk placed in the drive.

 To install a font or desk accessory into an application, hold down the OPTION key when clicking OPEN.... You'll get a choice of all files, not just Systems and DA files. And you can install a font or DA into any application. Why would you want to? Maybe you need a foreign language font only in your word processor and some fancy display fonts only in MacPaint. By installing these fonts directly into the applications you'll be using them with, you can be sure of keeping the fonts and applications together when you move the applications to other disks with different systems.

MACDRAW


 Hold down the COMMAND key while pressing the mouse button, and the last tool used will automatically be selected. This avoids the constant annoyance of having to reselect the same tool again and again.


Do you need an unusually sized font? Create your text in MacDraw, then copy it into Microsoft Word, where it can be stretched to any size you want. The best

news of all is, it prints out perfectly on the LaserWriter. (Printing doesn't work as well on the ImageWriter.)


Steve Maller, San Francisco, CA


MACPASCAL

 Run two or more programs in a row by selecting them on the desktop and then choosing OPEN from the File menu. If an ImageWriter is attached and running, you'll also get a log of the activities performed.


 For quick and dirty debugging, select a program on the desktop and then choose OPEN from the File menu. Be sure your ImageWriter is turned on. If you make any errors, both the MacPascal error messages and the statement where the error occurred will be printed out in hard copy.

MICROSOFT WORD

 In Word, tiny type in 5, 6 and 7 point sizes will look best if it's printed in high quality, since the Mac scales existing 10, 12 or 14 point fonts down to half size. Be sure the larger sizes are in the System or in Word before trying this trick.


 The buttons in the dialog boxes all respond to COMMAND keys, with the COMMAND key and another key pressed at the same time. Among the commands that work: COMMAND D switches disk drives; COMMAND E ejects a disk; COMMAND PERIOD cancels a command.

Questions such as "Save changes before closing?" can be answered in several ways. You can click on the button displaying the answer you want, or hit RETURN to select the box with the heavier border, or press Y for "Yes, save it," or N for "No."


 Want to scale a graphic in Word? Press COMMAND, SHIFT and Y together, then choose a number (from 0-9) to scale down a graphic to the number's corresponding size. Experiment with this to see which sizes work best for your purposes.

Steve Maller, San Francisco, CA

FINDER

 You can work with the little mini icons that appear when you select a desktop display other than standard icon format (such as name, size, date, etc.) just as though they were regular

icons. Double click to open them, and move and copy them just like you would with full-size icons.

 Does the typeface on your desktop look "wrong"? There are several possibilities that explain what might have happened, especially if you're not the only one who uses that Mac. The default font might have been changed by one of the noncommercial programs designed to do exactly that, such as the Change Application Font desk accessory and application (two different programs) or PRAM2 from the Boston Computer Society. All of these programs are available from users' groups and through BBSs and on-line services like The Source, Delphi and CompuServe.


The best solution in this case is to remove the Mac's battery for at least 30 seconds (remember to reset the date and time when you restart).


If that doesn't work, it's possible that the System has been modified and one or more of the "unremovable" fonts was indeed removed. If you suspect this is the case (have any friends who tend to like practical jokes?), try starting up with another disk containing a System you know is complete. Any System on a commercially sold disk is fine for this purpose.

The last possibility is that the battery

has failed. In this case, a new battery will solve what ails you.


MACPAINT

 To print a catalog (using the PRINT CATALOG command) of MacPaint documents on a disk other than the one your application is on, first open any MacPaint document on the disk you want to catalog. Now, just choose PRINT CATALOG from the File menu.


 Get ultrabold MacPaint letters by entering your text in BOLD and OUTLINE from the Style menu. Then use the FILL option to give letters a shaded effect.


RESOURCE EDITOR

This is a dangerous tool! Be sure to only work on a backup copy. Never use this tool on your only copy of anything, or one day you'll be very sorry!

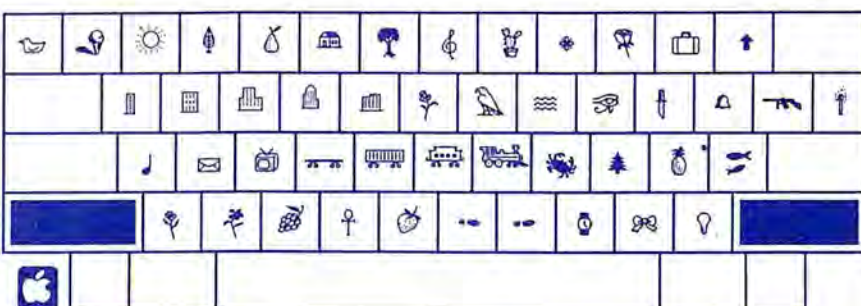
 When opening a resource, hold down the OPTION and SHIFT keys. You'll get a dialog box that lets you open any resource as though it was another resource type. This feature is particularly useful for examining version resources.

Open them as STR resources and instead of seeing hex data, you'll usually see an English language string. That string typically contains version numbers and things like that, but it can contain anything. Just type into the box to add to or change the text already there.





 MacPaint features a private font simply called 12. Among other things, this font contains the sizes of paint brush tools. They can be edited just like any font using Resource Editor's built-in tools. To edit this font, open MacPaint while in Resource Editor, scroll to the FONT resources, double click to open that, and then double-click on 12. You can scroll along the font in the large window and edit to the left of the box. The brush shapes are towards the end of the font. The largest square brush shape is also used as the eraser tool shape, so modifying it will modify both the brush shapes and the eraser. As you close down, save whenever you're asked to.

 If you're having trouble cutting resources, it's probably because the Clipboard is filling up. When you CUT, everything moves to the Clipboard, while when you CLEAR, the data just disappears. CUTS can be undone, but CLEARS are final—you can't UNDO them in any way.

Here we show the complete Key Caps for the Cairo font. Upper case characters are at the right, lower case characters are shown below. At the far right are special characters entered with the shown key combinations.



Some more characters from Cairo

Option - ` = 
 Option - i = 
 Option - v = 
 Option - Shift - a = 

BREAD AND BUTTER BUDGETING



The program allows plenty of flexibility, even for seat-of-the-pants financial planners. Only Split items can't be changed.

(continued from page 77)

two ID codes "SM" and "JM" so that his and hers clothing expenses could be subtotaled.

John pointed out, however, that they would need a long list of ID Codes to create all of the subcategories they needed for taxes and interest, and they would still not be able to identify categories by two ID Codes. For example, John wanted to be able to get a total of Sally's FICA or his. Worst of all, they found that the SPLIT transactions option did

not each have its own ID Code, and so the Marshes were back to square one again.

After the entire situation was analyzed thoroughly, they decided that creating separate categories for each major tax category was the only option that met their needs.

REPRESENTING TAXATION

John and Sally wanted a running total of the amount of taxes they had paid from all income sources. The task of keeping track of withholding



Pick your own category, then choose its Type from among the menu items.

taxes and other deductions does not match any of HAMac's features exactly and requires a bit of "fudging."

First, the Marshes created categories for Taxes—FICA, Taxes—Federal, and so on. Then, using each pay stub, they treated the total amount of money withheld as a Cash Account Deposit. After entering the deposit as the total amount of the deductions, each deduction was entered as a cash transaction. They used ID codes to indicate which of them had earned the money.

SPLITTING HAIRS (AND TRANSACTIONS)

The most important aspect of pre-planning is identifying those transactions belonging to more than one category (called SPLIT transactions) such as paychecks, deposits and loan payments. Since the bank hadn't provided them with amortization tables for either the mortgage payment or their car payment, the Marshes used the HAMac loan planning menu to print them out. Here again, the Marshes wanted an "exact" amount. HAMac could tell them

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BREAD AND BUTTER BUDGETING

how much of the payment each month went for principal (used to reduce the loan on their house, which was assigned to the liability group) and how much of the payment went for interest. The remainder of their monthly payment was for taxes and insurance, which the bank put in escrow.

When they enter the mortgage payment check each month, they check the SPLIT box and enter four categories and amounts: Loan-house, Interest-house, Property taxes, and Insurance-house. The *HAMac* system does not allow for memos on SPLIT transactions, nor does it allow for ID codes.

PLANNING FOR FUTURE GOALS

Eva Donovan, a single professional, wants to buy a condominium. She has her eye on one that is selling for \$50,000. She figures that \$10,000 will cover her down payment, closing costs, and a little bit of decorating. Eva's question is "How much must I save each month to buy the condo in one year? Or in two years?" *HAMac* can answer that question in a flash, and figure in the interest you would receive on your money as you save, and also figure what inflation is doing to the amount of money that you need.

First, Eva worked out the approximate monthly payment on a \$45,000 loan for 20 years. Then she let *HAMac* figure the amount of money she needed to save to have the \$10,000 needed to settle and move in. *HAMac* reported that she


needed to save \$461 a month for about 2 years. If she waits a year to get started, she'll need to save \$971 a month. *HAMac* also calculates the interest Eva will receive over the two years of saving and the amount she'll need to match the buying power of \$10,000 at her estimated rate of inflation.

JACK'S GOAL: NO CAR PAYMENT

Jack Kilgallen likes to pay cash for his automobiles. He recently bought a compact car for \$13,800. Curious as to how much a similar vehicle would cost if he kept the car for 5 years, *HAMac* provided the answer as well as how much Jack would need to save each month over the same time frame in order to pay cash for his next "comparable" car. *HAMac* also provides information on how much money Jack saved by paying cash instead of financing.

YOUR BUDGET'S BREAD AND BUTTER

Do you need *HAMac*? That all depends. If you have never bounced a check by mistake or applied for a bank loan, know where every penny in your budget goes and keep meticulous records neatly filed and ready for tax time, you probably don't need this program.

But if you constantly find yourself running a week or two ahead of your paycheck, only to puzzle over mountains of receipts and drawers full of bills when it's time to pay the tax man, this one's for you. It could just pay off in financial dollars—and even more in budget sense. 

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Follows Mac Interface: ★★★★★
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Comments: Personal finance management system offering incredible flexibility in record-handling.

Best Feature: Generates a wide

variety of printed reports; flexible use.

Worst Feature: Users can't enter a memo on Split transactions; once a transaction has been saved as a record, its file can't be split.

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ANSWERS FROM THE MAC TEAM

by Dan Cochran

Got a Mac problem? Something that you'd like explained? Something you can't find the answer for anywhere else? Apple's Dan Cochran will answer your questions every month in this space. When the questions are too tough for him, he'll get the answers from other members of the Mac team. So ask what you need to know and get your answers straight from the source!

Send your questions to Dan care of MacUser, 25 West 39th Street, New York, NY 10018. Dan will read all of your questions, but, unfortunately, he may not be able to answer individual queries. Watch this space for the pick of each month's Q & A crop.

I think I've found a bug in the ToolBox. It seems that a call to the barManager with the constant draughtGuinness insists on returning germanImport. Seems to get stuck in a loop for about 36 times. Inside Macintosh doesn't shed any light on this problem. Any advice?

Doyle B. Myers
San Jose, CA

The first thing to do is to increment hopCount before calling barManager. If your barManager call is in a loop make sure that your increment procedure is outside of the loop or you're likely to have additional problems. Also make sure that foamVolume (usually set by the user via the control panel and usually not of concern to application programs) hasn't been tampered with by another application or desk accessory. Thanks to Bryan Stearns and Jim Friedlander of Macintosh Technical Support for their advice on this subject. Cheers!

Why is it that when I add new fonts to my System file, they no longer appear in alphabetical order within the font menu? Is there any way to manually fix the listing?

Bruce E. Selzer
Redlands, CA



The best way to fix your problem is to rush right out and buy a Macintosh Plus or a Macintosh Plus upgrade for your current machine. The original 128K and 512K Macintoshes listed the fonts in the reverse order of the sequence in which they were added to the System file. The new Resource Manager that's part and parcel of the Macintosh Plus will automatically alphabetize not only the font menu but the desk accessory menu as well. Another neat feature of the new Macintosh Plus is its scrollable font menu. If you've ever tried to have more than 20 fonts displayed in a font menu you'll know what I mean. They were there, you knew, you put them in and you could see them (in Font/DA Mover or ResEdit). But you couldn't use them.

While we're on the subject of fonts the new Key Caps desk accessory allows you to see what each and every font looks like, not just Chicago! And a new menu item lets you see what's in other fonts.

Unfortunately, there is no way to manually alphabetize your fonts on your current machine short of starting with a new System file without any fonts and using the Font/DA Mover to copy fonts to the new System in reverse alphabetical order.

I am using Finder version 5.0. Why won't it display the size of Folders when Display by Size is selected?

Jim Ralston
Greensboro, NC

Finder 5.0 (and 5.1, which is shipping with the new Mac Plus) supports the new Hierarchical File System (HFS)

which provides a much faster and efficient means of managing a large number of files and folders. HFS, however, isn't able to determine the size of a folder unless that folder is open — a minor tradeoff in functionality for speed.

By the way, while you can use versions 5.0 or 5.1 (5.1 is better, it fixes and improves 5.0 slightly) with the Macintosh Plus, Mac 512 and Mac XL, it may not work properly with the Mac 128 and should not be used with those computers. Owners of 128K Macs should continue to use Finder 4.1.

How can I create an HFS volume on a 400K floppy disk? And is there any easy way to tell whether a volume is an HFS volume or the old flat-file volume?

Janet Roth
Cheyenne, WY

First, be sure that your System supports HFS. Then hold down the Option key while initializing or erasing a 400K disk. This will format the disk as an HFS volume. Remember, though, that there is no way to force the old flat-file volume structure on a volume that's over 400K in size.

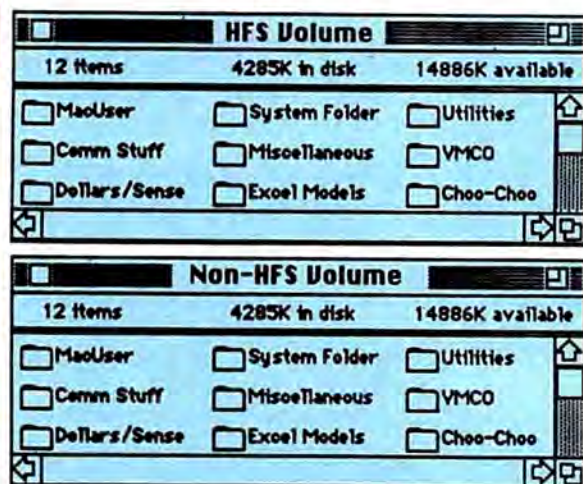
An easy way to tell whether a disk is an HFS volume is to look carefully at the closely spaced horizontal lines below the volume information in a volume window. If there is one black dot or pixel, that volume has been formatted with the HFS file structure (top window). If the dot is absent, that volume has the old, flat-file structure (bottom window):

Page 43 of the MacDraw manual states that you can draw a rectangle to border your text. Any text then typed in the rectangle will then automatically word-wrap. This does not happen. Do I need version 1.9 of MacDraw?

William S. Halstead
East Hempstead, NY

This feature works in versions 1.7 and 1.9 of MacDraw. The trick is to (1) first draw the rectangle, (2) select the rectangle so that it is highlighted, and finally (3) simply start typing away. This feature won't work if you draw the rectangle, select the text cursor from the palette, select an insertion point in the rectangle, and then start to type.

I have the new Hard Disk 20 with the Hierarchical File System. I like to keep my documents in separate descriptive folders. Do I have to put a



A single black dot or pixel means that this is an HFS formatted volume.

Dot is absent ... This is not an HFS volume.

copy of each application in the folders? In fact, will it help speed performance to, say, put a copy of *MacWrite* in each folder that contains *MacWrite* documents?

David Hart
Brooklyn, NY

The answer is no, do not put multiple copies of applications throughout your HD20. HFS creates a new resource type (APPL) in the Desktop file that points to the exact location of each application on the disk. Thus when you launch a document there is no extensive search. The APPL resource tells the Finder exactly where the proper application will be found if it is on the disk.

I know that I have to create a Bundle (BNDL) resource when I add my custom icon to an application that came with only the generic (default) application icon. I even know how to create the BNDL resource. I know that the bundle's function is to tie an icon to a file type. The question is: How does the Finder do this?

Pam Monsini
Denver, CO

[Answer by Ginger Jernigan of Macintosh Technical Support.]

When the Finder encounters a file type it needs to display, it looks up the type in the Desktop file. The Desktop file is used by the Finder to keep track of all pertinent information about how to display the documents on a volume. If the Finder finds a bundle for the file in the Desktop file, then it uses the associated icon when it displays the file. If it can't find a bundle, then it uses the default document or application icon.

If the file is an application that has the

bundle bit set, but the bundle isn't in the Desktop file, the Finder makes a copy of the bundle and puts it in the Desktop file. The application is then displayed with its associated icon.



If a data file has lost its icon (it's on a disk without the application and the Desktop file was trashed), then it will be displayed with the default document icon until the Finder encounters a copy of the application that contains the right bundle. The Finder then makes a copy of the application's bundle and places it in the Desktop file of the data file's disk.

Please explain the types of memory testing performed by the Macintosh on power up. Does the Macintosh write and/or read to each byte of memory or just a random read/write to memory locations? Is memory always cleared at power up?

Barry Cohn
Louisville, KY

Each time the Macintosh is switched on, the boot ROM code determines how much memory is present and then tests each and every byte. When you, however, restart your machine after a system crash or when using the reset switch the same tests are usually performed, but aren't guaranteed to take place.

The memory test itself consists of filling all the 68000 registers with a repeating three-byte pattern. A looping MOVEM.L assembly language instruction copies the contents of the registers to all available memory. This write operation alternates between the highest available and lowest available bytes of untested memory until the patterns converge in the memory map.

Next, the code looks at every byte of memory, from the lowest to the highest byte, comparing every three-byte pattern against the register standards. If a single bit is different the Macintosh fails the test and reports the error and location of the defective byte. You'll get a sad Macintosh and a number that can be decoded to track down the offending RAM chip.

Since the number of registers available for the memory write operation is not an even multiple of memory size, several bytes (possibly up to 24) can be left untested in high memory. These bytes, however, aren't typically used by user programs or data.

After the memory test completes, each byte of memory is filled with an SFF, using the same method described above. Again, several bytes may be left unwritten. Next the screen is filled with the familiar gray desktop pattern and booting proceeds.

Thanks to Chris Espinosa for the above play-by-play. ☺

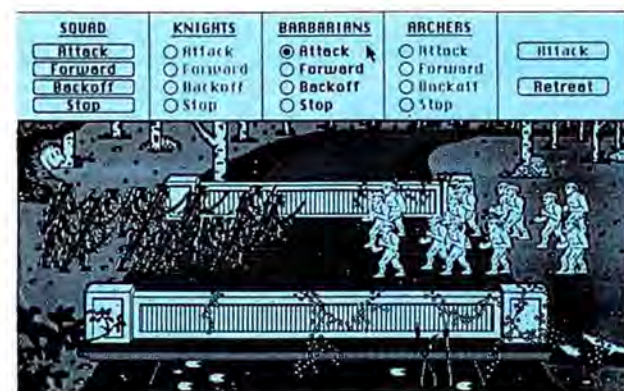
DESIGNER BATTLES

Using the predesigned map segments, it's easy to construct just about any kind of terrain.

The mini-map at the lower left side of the screen tracks your creation process step by step.



Each troop type can be individually controlled in the battle sequence. Here, the general can only control barbarians.



(continued from page 99)

feel for the system. But then I decided to get serious and to see if it would be possible to design a battle as "professional" playing and appearing as those included.

To do so meant I would have to do some thinking and research. First, it was necessary to recognize the game's weak points as well as its strong design points. For example, there were no mounted troops available and while there were plenty of bowmen there were no gunpowder-equipped warriors. I knew it would be possible to kludge a way around both of these problems.

Allowing only one troop the ability to quick march would simulate fast-moving cavalry, arrows could mean bullets. But it just would not look right and to include such would, I felt sure, destroy the part of the program I most loved—its realistic feel.

So, I needed a battle which involved only archers and hand-to-hand troops in a somewhat medieval-style setting. It soon became apparent that it would be easy to

simulate small skirmishes within a larger battle.

But could an entire battle be simulated with this game? As a wargamer, I asked myself if I could design a wargame scenario at what is known as the Grand Tactical level. Each unit would really represent many, but very similar, units.

I pulled down a few reference books and (in the book *Medieval England* from Oxford University Press) finally found a battle that I thought *Ancient Art of War* could handle simulating. It was the Battle of Flodden Field which had taken place in 1513 AD. The book had much information on the battle, its history and maps.

I moused to the Game Generator portion of *The Ancient Art of War* in order to create a "campaign disk." I would be led step-by-step through the mechanics of this creation process, but it quickly became apparent that I was right to have done my homework.

The first thing to do was to make a map. At the top of the screen was a view of a section of the entire (now

blank) scrolling map. In the lower left section of the screen was a mini-map, a miniature version of the entire map. At the bottom right of the screen were the mapboard "pieces" with which I could fill the map.

Arranged in rows were squares of terrain representing various formations of hills and plains, water and bridges. I could click on a piece with the mouse and drag it to the position I wanted it on the mapboard. Four complete screens of assorted map pieces are available which cover just about any type of terrain possibility.

The "Flodden Field" map from *Medieval England* at hand, I began to build my battlefield. The river and low hills went together nicely, as did the rugged hills the battle was fought near. It took a while to understand how the jigsaw-like pieces could be made to fit but it soon became easy to form terrain that appeared astonishingly close to my source material.

Once the terrain was together it was time to form and place my squads. Because of the Grand Tactical nature of my idea, each of my squads would represent more than the fourteen troops shown. Still, it was fairly simple to balance the forces as shown by the tactical battle map I had found in the history book. I placed my squads of Scots soldiers (seasoned with a few archers) on the two hills I had created near the southern bottom of the map. The hill to the left was Flodden Hill, where the actual battle would commence. The hill to the right was Brankston Hill, where the Scots had made camp. To represent the camp I placed a village symbol on the right hand hill.

The Earl of Surrey's knights and men at arms were placed in a column of march from the two castles that had served as gathering points in the north. The Earl's elite forces were in the center. For the formation of each group I chose the so-called "Rumble" formation as it seemed that would best simulate the rush to arms that characterized a pre-Napoleonic battle in England.

Then it was time to place the critical flags. Each side would have



ON YOUR MACS!

to do its best to capture the opposing flag. It was critical to the simulation to place these flags properly so that their presence would make the lines of battle flow as they had historically.

I placed one English flag in Etal Castle and another in Ford Castle, which I had originally positioned as my source map showed. I reasoned that this would cause the computer-controlled Scots to attempt a breakout from their position, through English lines and ultimately, to occupy the castles.

The Scots flag was simple to place—it went directly within the village that symbolized the Scots camp. The English would have to quell the Scots' attack and overrun the Scots' base while making certain no breakout occurred to jeopardize their own flags.

Then it was time to change the various rules, or variables, that govern a scenario. I made crossing water and hills extremely dangerous as, in this game, each unit represented many men. I also disallowed castles from producing more soldiers. I reasoned that most, if not all, of the armed might would be present at the battle and that the battle would not simulate enough time for more troops to be trained.

Then it was time to write the "story" of the campaign—the introduction that each player would read. I typed, "In 1513, James of Scotland crossed the border knowing that England's King Henry VIII was at the wars in France. But the Earl of Surrey did not hesitate to take the field against the invader. Even though James and his pikemen held

the higher ground, Surrey's men-at-arms would, with traditional broadsword and halberd, carry the day. Can you, as the Earl of Surrey, defeat James and overrun his camp before the Scots capture Etal Castle in the North and Castle Ford in the South?"

I named my scenario simply "Flodden Field—1513 AD" and then, with trembling mouse, chose to play my own created scenario.

What an experience! The battle raged along purely historical lines and it became clear that the Earl of Surrey had been, indeed, a splendid tactician. (I always choose Sun Tzu, who represents the most advanced computer level, to play the Scot). Even now, more than half the time the Scots will get by me and take the castles and flags.

(The "Flodden Field" scenario is available on CompuServe's MAUG group in that group's DL4 area if you would like to try playing it.)

FINAL SHOTS

My only disappointment in the game was mentioned briefly above. There should be two more soldier types. Until cavalry and gunpowder troops can be simulated in animation there will always be battles that cannot be easily fought in this system. I hope that a future version will include such troops.

But this criticism does not detract from the game as it now stands, a beautifully designed and executed labor of love (and war!). The wealth of detail, its animated beauty and the zest of game designing all go into making *The Ancient Art of War* a truly classic wargame. ☞

(continued from page 73)

lines), is good and absolutely necessary. RSG also allows users to set multiple tabs of various widths, a feature not found even on the much more expensive *PageMaker*.

The program's major limitations, however, will get in some folks' way. Manhattan Graphics should think about adding scroll bars to the screen, fixing it to accept formatted word processing files and take (at least) *MacPaint* documents directly, without using the Scrapbook.

While RSG's basic philosophy of treating everything in "block" fashion might seem a bit eccentric compared to the way that *PageMaker* or *MacPublisher* treat text and graphics, this idiosyncrasy lends itself to performing a few tricks. By organizing text in a number of wide but shallow text blocks, it is possible to set type around irregularly-shaped graphics or in unusual shapes. This is, however, a time-consuming task and demands extreme accuracy, so it isn't something you'll want to try on every layout.

Of course, LaserWriter output of RSG pages makes the best use of the program but, unlike *PageMaker*, which virtually demands the laser printer, RSG can yield some impressive results when used with ImageWriter, too. This is certainly an advantage for most of us.

For those who do repetitive layouts—say, formatting a weekly report with lots of numbers in which only the information changes with each new edition—RSG allows you to save only the page layout and not the information, text or pictures within it. This way, new text, illustrations or numerical data can be easily placed in each new report—a very handy feature.

Best of all, however, Manhattan Graphics achieved what it set out to do. Because of its very free-form design, *ReadySetGo* is the desktop publishing program that works in the manner most familiar to layout people. This may not be of value to everyone, especially those users with a strong editorial or word-oriented background, but it is an effective and comfortable place to start for many artists and novices. ☞

The Ancient Art of War: Report Card

Overall Rating: *****

Follows Mac Interface: *****
Printed Documentation: *****
On-Screen Help: *****
Performance: *****
Support: *****
Consumer Value: *****

Comments: *Ancient Art of War* is an excellent game that includes a powerful game generator feature.
Best Feature: The animated bat-

ties are as much fun to watch as a movie.

Worst Feature: No cavalry or rifle-men.

List Price: \$44.95. 128K, no printer or external disk required. Copy-protected.

Published by Broderbund Software, 17 Paul Dr., San Rafael, CA 94903-2101. (415) 479-1170.

MacSuper 20 FP

68020.
68881.
16 MegaHertz.
32-bit Data Path.

Magic Numbers:

We won't make fantastic claims about the MacSuper 20 FP. We'll just give you the facts. First, the upgrade features the 68020 processor, the "big brother" of the 68000 found in your Macintosh. It runs at 16MHz, or twice the Mac's basic clock rate. It uses a 32-bit data path, twice as wide as the 68000, allowing it to access twice as much memory at a time. The 68020 communicates directly with the 68881, a floating-point math co-processor, boosting the performance of number-crunching programs such as spreadsheets. The upgrade features a built-in SCSI port that is functionally identical to the SCSI port found on the new Mac+™. Finally, the MacSuper 20 FP has four megabytes of RAM, and clips onto 128K, 512K or Mac+, requiring no modifications to the original Macintosh circuit board.

The bottom line is that you end up with a work station that operates at least four times the speed of a normal Macintosh. Faster than a DEC VAX 11/785. Faster than a IBM PC AT.

Magic Words: Available Now.

Levco

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THE CHEAT SHEET

(continued from page 90)

to learn as much as possible as you can about the solution.

First, take copious notes. While that address or suspect's name might not be important to you the first time you hear it, sooner or later you'll wish you had made a reference card. For information-heavy games like *Deja Vu*, *Borrowed Time* and *Ultima II*, it pays to set aside a notebook, or at least a section of a notebook, which you'll always keep nearby when you play the game. Jot down anything that seems relevant, even if it makes no sense at the time, since all the pieces of the puzzle will eventually fit together. Some games, like Silicon Beach Software's *Enchanted Scepters*, even include the Note Pad desk accessory, and smart players will use it to its fullest.

Second, make sure to save the game constantly. Many games, *Borrowed Time* and *Deja Vu* in particular, make it easy to save games every few moves, meaning that if you do something fatal you can easily back-track.

Finally, map everything, studying your map to be sure you haven't missed a critical location in your wanderings. Make sure you've painstakingly looked in every nook and cranny of every room. Try to make use of visual clues that might not be mentioned in text bars, like a large chest pictured in a room that makes no mention of it, or a window that looks like it could be climbed through. Take nothing for granted. If you have a wallet, try opening it, and you could just find an item you thought you had to look for. Open everything, talk to everyone, and try everything you can possibly imagine. If that fails, do it all again, and this time you just might stumble on a person or place you hadn't seen before, or a new approach to a situation you thought was unsolvable.

If all that fails, relax. Put the game away a while, and you might have some fresh ideas the next time you boot it up. Try playing with a friend, who might offer a new insight. Most important, remember that your adventure is supposed to be fun.

After all...it's only a game! ☞

Mac the Knife Volume 3: Mac the Ripper

Faster than a speedball pen! More powerful than a takeover bid! Able to leap past editors in a single revision! It's graphics, it's artwork, it's more fun from Miles Computing! Yes, it's true! The folks who made clip-art a

household word, now present a specially priced two-disk set jammed full of eye-popping art and big huge fonts! So before you start to layout that newsletter or flyer, make sure you go with the Ripper!



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OUTSTANDING CLIP-ART FROM MILES

MINIFINDERS

Ever go into a computer store and wish you had someone you could trust tell you what the various programs and accessories do and how well they do it? These *MiniFinders* detail items chosen by the editors. Each one has been rated from 1 to 5 mice and there are even a few bomb icons scattered here and there. **Red names indicate this month's additions.** And, since so many of you have asked, we've included a code that indicates whether or not a program is copy protected. CP means copy protected, NCP means not copy protected, NCPE means a non-copy-protected version is available at extra cost and CP? means we don't know the status. If you do, write us at *MiniFinders*, c/o MacUser, 25 West 39th St., New York, NY 10018. Next time you have to find products you can count on, count on MacUser!

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INTEGRATED SOFTWARE

Crunch is an icon-driven relational spreadsheet that features versatile charting and database capabilities. Strong financial logic, date and mathematical functions. Spreadsheets can be linked. The manual is clear and concisely written. Macros are not supported. \$195. Paladin, 2895 Zanker Rd., San Jose, CA 95134. CP

Ensemble lets users create a database of words, pictures, and/or numbers; graph data; generate custom forms and link files for applications such as mail merge. Can perform calculations and math functions on data. Capacity limited by RAM and disk size. \$299.95. Hayden, 600 Suffolk St., Lowell, MA 01854. CP

Excel is THE power spreadsheet. Of the Mac, of the world. Has 256-column by 16,384-row capability. Features include a powerful, easy to use macro function (with a recorder to make creation simple) and elaborate charting facilities. Can link multiple spreadsheets. 512K Mac and external drive required. \$395. Microsoft, 10700 Northup Way, Bellevue, WA 98009. CP

Jazz provides well integrated modules for word processing, graphs, worksheets, databases and communications. Each of the modules is substantial. HotView, where data placed in any module automatically updates all other documents that use that data, is best feature. Jazz provides adequate coverage of most data and communications needs of small businesses. Requires 512K and external Drive. \$595. Lotus, 55 Cambridge Parkway, Cambridge, MA 02142. CP



Quartet is an integrated program that works on a 128K Mac, built around a powerful spreadsheet with a full range of functions. It can also be used as a database and provides good quality charts from spreadsheet data. Documentation is adequate but not too well organized. \$199. Haba Systems, 15154 Stagg St., Van Nuys, CA 91405. CP

BUSINESS ACCOUNTING

Accountant's Choice is a powerful system built around a relational database, with functions accessed through menus. Standard reports are provided but most can be customized. Multiple journals allowed. Number of accounts determined by disk space. General Ledger can stand alone or integrate with other modules, not yet available. Requires 512K, printer and external drive. \$695. Sierra Information Systems, 10201 Torre Ave., Cupertino, CA 95014. CP?

AMS General Ledger is a Ledger with five preset journals: Cash Disbursements, Receipts, General, Sales, and Purchases. Other modules are planned. Account ranges are preset. Menus and data entry are very straightforward. Flexible summary reports are built in, but customer and vendor information is very minimal. \$295. Check Mark Software PO Box 860, Fort Collins, CO 80522. CP?

Gallery Finance is a one-write system with General Ledger, Cash Disbursements, Payables and Receivables in a single package. Additional modules to be added. Data entered in a journal is automatically posted to appropriate record card. Excellent manual includes tutorial on basic accounting principles. Requires 512K, printer and external drive. \$795. Micromax Systems, 6868 Nancy Ridge Dr., San Diego, CA 92121. CP?

Hardisk is a complex integrated hard disk system (General Ledger, Receivables, Payables, Inventory, Payroll and Job Cost modules) that does not use Mac interface. Fully menu driven. Manual is detailed but complicated, with a few extra pages that make it Mac-specific. Flexible reporting, statements and account numbering; huge numbers of accounts, transactions, profit centers and detailed financial analysis. Requires hard disk and printer. \$695 per module. Great Plains, Box 9739, Fargo, ND 58109. CP?

MacOneWrite Cash Disbursements is a simple, one-write check writing system. Limited functionality, but does allow some detailed information. Menus clear and easy to follow, but check printing can be confusing. Other modules planned. 512K and printer required. \$245. Sierra, PO Box 485, Coarsegold, CA 93614. CP?

Palantir is a simple, inexpensive accounting system for a 128K, one drive Macintosh. Manual is clear and concise; program uses icons for common operations; menus are clear and detailed, with most operations easy to find and use. Flexible report formatting and a customized chart of accounts. Program is written in Microsoft BASIC so it is very slow. Nice design but the speed is intolerable. Requires Microsoft BASIC, printer. \$145 per module. Palantir, 12777 Jones Rd., Houston, TX 77070. CP?

Rags to Riches integrated accounting modules (General Ledger and Accounts Receivable) use Mac interface to the hilt. Information entered in one window automatically transfers. Menu commands all have command keystrokes, as can accounts. No detailed or flexible reporting. Very easy to use, although it can be confusing to operate with several windows on screen. Requires 512K and printer. \$199.95 per module. Chang Labs, 5300 Stevens Creek Blvd., San Jose, CA 95129. CP

Strictly Business General Ledger features clear, well-outlined set-up procedures and operations. Very flexible, with a custom chart of accounts; user-defined journals; up to 99 profit centers per company with up to 100 departments each; and customized reports. Program spools to printer and allows for printing of multiple documents. Built-in Smooth-Talker gives verbal error messages or entries, if desired.



Other modules planned. Requires 512K, printer and external drive. \$395. Future Design Software, 13681 Williamette Dr., Westminster, CA 92683. CP?

PERSONAL FINANCE

Dollars & Sense is a bookkeeping program suitable for personal, home and small-business use. Easy to use, with a good manual and excellent on-screen help. Will handle up to 120 separate accounts or money categories. Uses standard double-entry accounting techniques. Reports can be generated and either viewed on-screen or printed. Has simple graphing and charting facilities. \$149.95. Monogram, 8295 S. La Cienega Blvd., Inglewood, CA 90301. CP

Electric Checkbook does exactly what the name says: keeps a running account of checkbook transactions, balances checkbook to bank statements, tracks bills, and even prints out checks. Provides detailed financial statements, calculates net worth, lists expenses by category and tracks your personal cash flow. \$79.95. State of the Art, 3191-C Airport Loop, Costa Mesa, CA 92626. CP

Financial Cookbook provides nearly 3 dozen "recipes" to help users figure out financial formulas (i.e., mortgage costs at different percentage rates) by inputting pertinent data. Very user-friendly. \$44.95. Electronic Arts, 2755 Campus Drive, San Mateo, CA 94403. CP

Financial Utilities Pack is a set of applications that allow users to figure annuities, compound and simple interest, depreciation and amortization. Simple and well documented. \$69. Cognitive Software, PO Box 26948, Austin, TX 78755. NCP

Forecast is a tax estimating and what-if program designed to work with and use *Dollars & Sense* files. Straightforward, easy to use program. \$69.95. Monogram, 8295 S. La Cienega Blvd., Inglewood, CA 90301. CP

The Home Accountant is a complete and easy to use financial system. Data entry is intuitive. All kinds of reports, including charts and checks, are easily generated. Entered data will update all relevant material. \$150. Arrays, 6711 Valjean Ave., Van Nuys, CA 91406. CP

WillWriter uses a rule-based system to create wills valid in all states except LA. Simple to use, comes with a complete book on wills. \$39.95. Legisoft/Nolo Press, 950 Parker St., Berkeley, CA 94710. NCP

DATABASES

Business Filevision is a masterpiece of Macintosh programming, the only true graphic database on any micro. Much more powerful than the original, accepts *MacPaint* graphics. \$395. Telos Software, 3420 Ocean Park Blvd, Santa Monica, CA 90405. CP

Factfinder is a free-form information organizer (medium-duty database). Users enter data on to factsheets in any manner desired and select keywords. Searches are by name or keyword. Only one factsheet can be open at a time. Publisher offers free telephone support (800 number). \$149.95. Forethought, 1973 Landings Dr., Mountain View, CA 94943. NCP

FileMaker is a nonrelational database that combines lots of power with ease of use. Data entry is extremely flexible and all items in all fields are indexed so that multiple criteria searches are both simple and fast. Calculation fields make the creation of invoices and similar documents a snap. Reports can include graphics and multiple data layouts are easy to construct. \$195. Forethought, 1973 Landings Dr., Mountain View, CA 94943. NCP

Filevision is a simple database that can change the way you think about data and data organization. Records are based around user-created graphics screens. Screens and records can be linked in complex ways. \$195. Telos Software, 3420 Ocean Park Boulevard, Santa Monica, CA 90405. CP

1stBase is a small, easy to use database that allows users to join or append files. It is the simplest, most accessible relational database available for the Mac. Supports calculated fields, including statistical summaries such as averages. Integrates with *1stMerge* and *1stPort*. \$195. DeskTop Software, 244 Wall St., Princeton, NJ 08540. CP

Hellx is a relational database that makes extensive use of icons. Excels in database setup and forms generation. Setup is made easy by the adherence to the Mac interface. The manual is clear, thorough and well-indexed. Too complicated for most simple database applications, excellent where a relational database application is required. Requires a 512K Mac and an external drive, but is slow on that configuration. \$395. Odesta, 4084 Commercial Blvd., Northbrook, IL 60062. NCP

The Housekeeper is a home inventory database. Users can keep track of assets for both tax and casualty purposes. Specialized reports are easily generated. \$59.95. Aegis Development, # 277, 2210 Wilshire Blvd., Santa Monica, CA 90403. NCP

I Know It's Here Somewhere stores information in a simple filing system. Ideal for general household or small business use. File formats are flexible and 31 samples are included. Can cross reference up to five files at a time; perform simple, wild card, or multiple key searches; and print selected items or whole files. \$59.95. Hayden, 600 Suffolk St., Lowell, MA 01854. NCP

Interlace is a flexible relational database that makes it simple to create single or multiple files and establish links between files. Excellent report generator gives full control over appearance, style of output. Switcher, LaserWriter, hard disk and HFS compatible. Requires 512K, second drive or hard disk highly recommended. \$129 retail, \$95 direct. Singular Software, 5888 Castano Dr., San Jose, CA 95129. CP?

MacLion is a true relational database program. Can handle all databasing requirements although set up may require outside (consultant) help. Has a built-in programming language (LEO) and can be customized for any. Can handle very large files as well as multiple files. \$379. Computer Software Design, 1904 Wright Circle, Anaheim, CA 92806. CP

MegaFiler is a simple file manager. Its limited capabilities have been far surpassed by cheaper and easier to use programs. Valuable only in conjunction with *MegaForm*. \$195. Mega-haus, 5703 Oberlin Dr., San Diego, CA 92121. CP

Microsoft File is a flexible data manager. Creates files for a variety of data, including simple graphics. Files are created in simple row/column format, but reports and forms are easily customized by moving field names around on a blank form. Sorting is limited to approximately 5000 records on 128K Mac. \$195. Microsoft, 10700 Northup Way, Bellevue, WA 98004. CP

Omnis 3 is a power database, featuring concurrent multiple file management. Can handle 24 files, 12 at a time, and is fully relational. Allows user to create custom environments including user-defined menus, commands and dialogs. Good report generation capability. Comes in single and multiple user versions. \$495 (single user version). Blyth, 2655 Campus Drive, Suite 150, San Mateo, CA 94403. CP

Professional Bibliographic System is a database designed for storing and retrieving bibliographies. Predesigned forms for 20 types of entries. Citations automatically formatted with correct punctuation for printing. \$295. Personal Bibliographic Software, PO Box 4250, Ann Arbor, MI 48106. CP?

OverVUE is a power-packed relational database that has extensive sorting, summarizing and report generation capacity. Has macros and a charting function. Good manual. The program tries to anticipate every need conceivable in manipulating data. It can exchange files with a very wide variety of other programs (including IBM software). Be sure to get version 2.0. \$295. ProVUE, 222 22nd St., Huntington Beach, CA 92648. CP

MINIFINDERS



Record Holder is a flexible, easy-to-use form-oriented data manager. Set up is particularly simple and the search features are powerful. Drawbacks are a somewhat limited report function and the inability to use fonts other than the default font and graphics at all. Has on-screen help. \$49.95. Software Discoveries, 99 Crestwood Rd., Tolland, CT 06084. CP?

NUMBER CRUNCHING

ClickOn Worksheet is a 50-row by 20-column spreadsheet that loads onto any system disk as a desk accessory. Though small in size, it has remarkable capabilities for a desk accessory. It produces line, bar and pie charts and changes in the worksheet automatically reflect in charts. \$79.95. T/Maker Company, 2115 Landings Dr., Mountain View, CA 94043. NCP?

Multiplan, the first Mac product from someone other than Apple is beginning to show age. Still a very capable basic spreadsheet with simple sorting, 63 columns by 255 rows, many built-in functions, other standard spreadsheet features. \$199.95. Microsoft, 10700 Northup Way, Bellevue, WA 98004. CP

ProAnalysis is a powerful real estate investment analysis program. This program uses the Mac interface as well as any program yet published. Analytic power is combined with report generating so good you have to see it produce an extraordinary product. Requires 512K. \$295. Technalysis Services, 14555 DeBell Rd., Los Altos Hills, CA 94022. CP

StatView is a high-powered statistical calculation package. Easily and efficiently handles all the common statistical techniques and tests many uncommon ones. Has a user definable area as well. Easy to use and well documented. \$199.95. BrainPower, # 250, 24009 Ventura Blvd., Calabasas, CA 91302. CP?

StatWorks is a general-purpose statistics package that is both powerful and easy to use. Handles all standard tests and procedures. Single variable and multivariate statistics are supported. \$125. Cricket Software, 3508 Market St., #206, Philadelphia, PA 19104. CP

GRAPHICS & DESIGN

Animation Toolkit I lets users prepare "film clips" of moving objects which play back at varying speed, like old-fashioned flip books. Drawings are built pixel by pixel in frames, using some of the tools from *MacPaint*. They can be copied and altered easily from frame to frame. Each film clip plays repetitiously as it is being constructed. A limited animation tool, but a lot of fun. \$49.95. Ann Arbor Softworks, 308 1/2 S. State St., Ann Arbor, MI 48104. CP?

Art Grabber with Body Shop is a desk accessory that lets users browse *MacPaint* documents, selecting and copying as they choose. Selections can be larger than screen size. Also included are *MacPaint* documents and templates to allow the creation of people in your art. \$49.95. Hayden, 600 Suffolk St., Lowell, MA 01853. CP

ClickArt Special Effects is a *MacPaint* enhancement desk accessory. Allows the user to distort, stretch, rotate and use perspective on *MacPaint* documents. A necessary addition for all serious users of *MacPaint*. \$49.95. T/Maker, 2115 Landings Dr., Mountain View, CA 94043. NCP

ColorPrint facilitates color printing on the standard *ImageWriter*. *MacPaint* files set up as overlays are read into *ColorPrint*, and the program controls proper positioning, registration and colored ribbon switching. Good results require lots of hard work, but it's cheaper than an *ImageWriter II*. \$49.95. Esoft Enterprises, PO Box 179, Owasso, OK 74055. NCP

DaVinci Building Blocks features predrawn blocks of brownstone, garden, and skyscraper portions that can be cut and pasted together to form landscape and architectural draw-

ings. Fun for even non-pros. \$79.95. Hayden, 600 Suffolk St., Lowell, MA 01853. CP

Fluent Fonts is a two-disk collection of fonts. Forty-nine different items are included. All install easily in user Systems. Most are well executed and some are extraordinarily nice. This is a real bargain for font lovers. \$49.95. Casady, PO Box 223779, Carmel, CA 93922. NCP

Fontastic is the best font editor now available for the Mac. Features a large editing window with a grid to make positioning easy. Select letters to edit by clicking on a matrix of the font. Allows scaling of existing fonts and previewing the various styles (italic, bold, etc.). \$49.95. Altsys, PO Box 865410, Plano, TX 75086. NCP

Icon Switcher changes icons for applications and the documents they generate, permitting you to customize icons for personal work. New icons can be built pixel by pixel in the program or created in *MacPaint* and pasted in. \$19.95. PBI Software, 1155B-H Chess Drive, Foster City, CA 94404. NCP

The Mac Art Dept. is a collection of over 150 graphic images ranging from foods to hands holding signs to borders. Best suited for letterheads, memos, other business use. Excellent manual. \$39.95. Simon & Schuster, Computer Software Div., 1230 Ave. of the Americas, New York, NY 10020. NCP

Mac the Knife/Vol. 1: Treasury contains over 500 pieces of clip art in the form of *MacPaint* documents and two new fonts. The art is well organized and mostly high quality. The rulers, for on-screen measurement, and the disk label templates are particularly useful. If you only plan on getting one clip art disk, this would be a good choice. \$39. Miles Computing, # 212, 7136 Haskell Ave., Van Nuys, CA 91406. NCP

Mac the Knife/Vol. 2: Fonts contains over two dozen new fonts. Some of these (Paris and Stuttgart, for example are real stunners). If you do a lot of word processing try Paris 9 point (it's a big 9 point) as your text face and use High quality printing. \$49. Miles Computing, # 212, 7136 Haskell Ave., Van Nuys, CA 91406. NCP

MacDraft is the step beyond *MacDraw*. This object-oriented drafting program is packed with advanced features such as rotation, zooming, auto dimensioning and scales. A professional level product. \$239. Innovative Data Design, 1975 Willow Pass Rd., Concord, CA 94520. CP

MacDraw is an object-oriented structured graphics program. Can be used to design forms, create presentation materials and do technical illustrations. Drawing sizes up to 8 feet by 10 feet are possible. Text can be easily generated and integrated in the graphics. *MacPaint* documents can be pasted into *MacDraw* documents, but not manipulated. \$195. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. NCP

MacPaint is the graphics program that started a whole new genre. Still the best freehand graphics tool. Version 1.5 supports 512K Macs and the LaserWriter. Multiple tools, patterns and features too numerous to describe. A work of art for artists. Comes with Macs. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. NCP

MacPublisher is a tool for creating newsletters. Allows multiple page issues. Layout is fairly easy but hard to do precisely. Style and font changing ability is limited. Runs on a 128K Mac but is slow; a 512K should be considered a requirement. Printer support, including LaserWriter, is good. Ideal for informal newsletters, not yet a professional tool. \$99.95. Boston Software Publishers, 19 Ledge Hill Rd., Boston, MA 02132. CP

Magic Slate is a graphics and design program with built-in special effects and custom features. Fun but sometimes difficult to use. Great for pattern design, block and geometric graphics and watercolor-style "washes." Requires 512K. \$99. Devionics, PO Box 2126, Covina, CA 91722. CP

Microsoft Chart is the standard to be matched in presentation graphics programs. Users can easily create area, bar, column, line, pie, scatter and combination charts. A total of 42 styles are provided. Limited to 100 data items (64 in a series) on a 128K Mac, approximately twice that on a 512K

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Mac. \$125. Microsoft, 10700 Northup Way, Bellevue, WA 98009. CP

M.U.D (MacroMind Utility Disk) is a disk of various utilities for
**** *MusicWorks* and *VideoWorks* owners. It also contains *CheapPaint* and *Art Grabber+*, two graphics desk accessories that are musts for graphics enthusiasts. Hayden, 600 Suffolk St., Lowell, MA 01854. CP?

PageMaker is an advanced layout and makeup program. Can
**** easily create multiple page documents. Output is optimized for LaserWriter. Good documentation. \$495. Aldus, 616 First Ave., Seattle, WA 98104. CP

ReadySetGo is a page makeup program for 512K Macs. Users
**** build up pages from blocks of text, graphics and rules. Resizing and scaling of blocks are supported. Each block can be precisely positioned. Text and art may be pasted in from another source or created within the program. Good LaserWriter support. \$125. Manhattan Graphics, 163 Varick St., New York, NY 10013. NCP

Slide Show Magician 1.3 is useful for creating full screen audio-
**** visual presentations on the Mac. Frame branching, improved editing capabilities, external cassette recorder synchronization and digitized sound capabilities make this much more powerful than the original. \$59.95. Magnum, 21115 Devonshire St., Chatsworth, CA 91311. CP

VideoWorks is a full-featured animation package. Professional
**** quality animations are easily accomplished using the tools provided. Features frame-by-frame and real-time modes. Comes with an art disk of predrawn images and *Art Grabber* (which allows the user to use any part of a *MacPaint* document in *VideoWorks*). Includes many special video and sound effects and many on-disk examples. \$99.95. Hayden, 600 Suffolk St., Lowell, MA 01854. CP

COMMUNICATIONS

InTouch comes with its own communications command language
**** able to do unattended sessions. Supports Xmodem, MacBinary and Kermit. Has a macro key function. Many sample set up documents and command language files provided. \$145. Palantir, 12777 Jones Rd., Houston, TX 77070. CP

MacTerminal provides basic telecommunications and terminal
** emulation for the Mac user. Doesn't have macros nor any sort of auto redial/auto logon capability. Best for those needing faithful VT100 or IBM 3278 emulation—it is superb at those. \$99. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. NCP

Red Ryder is a full-featured telecommunications program that
**** supports MacBinary, Xmodem and Kermit. Remote service procedures, auto procedure writer and keyboard macros allow automation of many operations. It is shareware and a real bargain. \$40. The FreeSoft Corp., 10828 Lacklink, St. Louis, MO 63114. NCP

Smartcom II balances power and ease of use. Capable of
**** unattended operation and has a very powerful command language. Supports MacBinary, Xmodem, and Hayes Verification protocols. The large screen buffer can easily be archived both to the printer and to disk. Lacks keyboard macros. \$149. Hayes, 5923 Peachtree Industrial Blvd., Norcross, GA 30092. NCP

Telescope is the power telecommunicator's terminal program. Can
*** be configured to emulate any terminal and has all the advanced features (except unattended operation). The documentation does not adequately explain the many features and much of the power will be unavailable to all but the pros (who can figure it out on their own). \$125. Mainstay, 28611B Canwood St., Agoura Hills, CA 91301. NCP

VersaTerm features include DEC VT100 and VT52, Tektronix 4014
**** graphics terminal and Data General DG200 emulation. Supports Xmodem and MacTerminal Xmodem protocols and MacBinary. *VersaTerm* is easy to use and well documented. \$99. Peripherals, Supplies & Computers, 2457 Perkiomen Ave., Mt. Penn, PA 19606. NCP

WORD & OUTLINE PROCESSORS

EgWord is a *MacWrite* lookalike that allows full Japanese kanji
*** word processing on the Mac. Does a superlative job of making Japanese text-entry as easy as possible, given the difficulties of the language. Great for students of Japanese, may find a place in international business as well. \$300. Counterpoint, PO Box 1685, Cambridge, MA 02138. CP?

1stMerge is a mail-merge program that integrates data files with
**** documents after a blueprint for documents has been designed. Features on-screen help, and the ability to add and search records. Requires *MacWrite*. \$95. DeskTop Software, 244 Wall St., Princeton, NJ 08540. CP

Hayden: Speller checks spelling errors in *MacWrite*, and *Word*
**** documents against a dictionary of 20,000 common words and user-created dictionary. Reasonably fast and quite simple to use. \$79.95. Hayden, 600 Suffolk St., Lowell, MA 01854. CP?

Just Text is a professional level word processor and page makeup
**** program that generates PostScript output. Comes with a set of LaserWriter utilities that allow total manipulation of art and text. Requires LaserWriter or other PostScript compatible output device. \$195. Knowledge Engineering, GPO Box 2139, New York, NY 10116. NCP

LaserFonts are new fonts designed for the LaserWriter. Users
**** download them to their machines. Very high quality and very simple to use. *Willamette* (in Medium, Light and Extra Light) looks like Avant Garde. *MicroFonts* provides tiny, expanded and condensed versions of the LaserWriter's own fonts. \$29.95 each. Century Software, 2306 Cotner Ave., Los Angeles, CA 90064. NCP

MacSpellRight is a spelling checker that works with *MacWrite* 4.5
** (not 2.2!). Allows the user to create custom dictionaries. Works from within *MacWrite*. \$89. Assimilation, 485 Alberto Way, Los Gatos, CA 95030. NCP

MacWrite is the basic word processor that comes with the Mac.
**** While it doesn't have every bell and whistle, it is more than adequate for most users. Features of the current version (4.5) include document size limited by disk space, global search and replace, page numbers indicated in the scroll bar and excellent LaserWriter compatibility. Easy to use and well documented. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. NCP

MegaForms is a well designed forms generator and processor.
*** Forms design is easy. Can use data from *MegaFiler*. The form filling and print functions are slow, possibly too much so for large scale use. \$295. Megahaus, 5703 Oberlin Dr., San Diego, CA 92121. CP

Microsoft Word is a power word processor for the Mac. It has just
**** about every feature your heart could desire. Supports keyboard commands as well as the mouse. Does mail merge and multicolumn text. \$195. Microsoft, 10700 Northup Way, Bellevue, WA 98009. CP

QuickWord is a word processing accessory that adds sophisticated
**** glossaries to *MacWrite*. Simple to install and use, yet powerful and efficient. \$49.95. EnterSet, # 408, 410 Townsend St., San Francisco, CA 94107. NCP?

Spellswell is an effective and powerful standalone spelling
**** checker. It has many advanced features such as capitalization and homonym checking and comes with a large, well-chosen dictionary. Full-featured, easy to use, with equivalents for all menu commands. \$49.95. Greene, Johnson, Inc., 15 Via Chualar, Monterey, CA 93940. NCP

ORGANIZATIONAL TOOLS

MacProject allows a user to plan and track a project from
*** beginning to end. Uses CPM to produce schedules with start and finish dates for each task. Can report on resource interdependencies and generate all needed printed reports. \$125. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. NCP

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MINIFINDERS



Micro Planner is a heavy-duty project planner. Excellent, but slow, at the mechanics of project planning. Reports are its weakness. Speed is much improved when a hard disk is used. \$395. Micro Planning Software USA, 235 Montgomery St., San Francisco, CA 94104. CP

ods/Consultant is a program that lets users organize ideas and helps in thinking through and solving problems. Easy to use thanks to extensive use of icons and on-screen help. This program introduces some low-level AI (artificial intelligence) concepts. \$200. Organization Development Software, # 535, 1011 E. Touhy Ave., Des Plaines, IL 60018. CP

ThinkTank 128 is a basic outline processor. The interface is not the standard Mac interface, but is simple to use and efficient. The program is speedy. Printer support is limited, but files can be printed in a draft-style mode. Only for 128K owners; 512K owners should get *ThinkTank 512*. \$145. Living VideoText, 2432 Charleston Rd., Mountain View, CA 94043. CP

ThinkTank 512 is a very fast and intuitive organizational tool that can handle word processing chores in the midst of structuring a plan or outline. Full keyboard control (without mouse) is possible. Can store and paste graphics into outlines. Slide show features allows high quality presentations to be created. Good report formatting and printing. \$245. Living VideoText, 2432 Charleston Rd., View, CA 94043. CP

DESK MANAGERS

Battery Pak is a set of 8 handy desk accessories including scientific and RPN calculators, a background text file printer and a 250-page note pad with search and phone dialing capabilities. Comes with an installer and the best manual we've seen in a long time. \$49.95. Batteries Included, 30 Mural St., Richmond Hill, Ontario, L4B 1B5, Canada. NCP

The Desk Organizer is a free-form desk management system based on card index style files. Has many features including alarms, report generation and calculation. The Meta feature lets the program run along with another application. \$99. Conceptual Instruments, 269 W. Walnut St., Philadelphia, PA 19144. CP?

Front Desk lets small businesses and offices easily keep track of personnel schedules, activities and payments. The program can keep track of up to 15 employees, functioning as a day-, week- and month-at-a-glance calendar. Highly recommended for doctors and dentists' offices. Less useful for offices less dependent on the human factor. \$149.95. Layered, 85 Merrimac St., Boston, MA 02114. CP

MacOffix combines many of the simple and necessary office functions in one easy-to-use package. Features include simple word processing, forms design, form letter production, report generation and filing. Good design nearly makes the manual unnecessary. \$79. Emerging Technology Inc., 4760 Walnut St., Boulder, CO 80301. CP

My Office lets you handle your files and papers in much the same way you did before you got a computer. Excellent use of graphic symbols makes this program the easiest to use of its type. \$129.95. DataPak, # 401, 14011 Ventura Blvd., Sherman Oaks, CA 91423. CP

Quickset is a set of five desk management and organizational tools that can be used as desk accessories or applications. Modular design allows users to add only selected items to System disks. Functions include note filer, card filer, calendar, financial and statistical calculators and a file encryptor. \$49.95. EnterSet, 410 Townsend St., San Francisco, CA 94107. NCP

Sidekick is a set of desk organization applications and accessories. Functions include phone dialer and logger, desk accessory terminal, calculator, clock, editor and more. When required resource files are included modules take up a lot of disk space, and are best used with a hard disk. \$84.95. Borland International, 4585 Scotts Valley Dr., Scotts Valley, CA 95066. NCP

UTILITIES

Accessory Pak 1 is a set of useful applications and utilities. *Paint Cutter* alone is worth the price. That program allows users to browse and manipulate full page *MacPaint* documents. \$39.95. Silicon Beach, # 201, 11212 Dalby Pl., San Diego, CA 92126. NCP

Copy II Mac was one of the first back-up programs available for the Mac. Does efficient sector and bit copies and in its latest version can back-up virtually all Mac software. Features graphic displays of copy progress. Comes with *MacTools*, a multiuse utility that can recover many damaged files. \$39.95. Central Point Software, #100, 9700 S.W. Capitol Highway, Portland, OR 97219. NCP

Disk Ranger is a speedy cataloguing program that doubles as an efficient labelmaker. Comes with pinfeed labels. Works with regular and hard disks. \$49.95. Mainstay, 28611B Canwood St., Agoura Hills, CA 91301. NCP

Dubl-Click Calculator Construction Set lets users design personalized calculators with a variety of standard and special functions. Multiple functions can be attached to a single key. Finished calculators can be saved as installable desk accessories or as clickable applications. \$99. Dubl-Click Software, 18201, Gresham St., Northridge, CA 91321. CP?

Fedit is the best disk editor available for the Mac. The program also includes extremely powerful disk and file repair and recovery facilities. All Mac owners should have this tool on hand for emergencies. It is easy enough to use that everyone can use it. And best of all, it's shareware. \$30. John Mitchell, 939 E. El Camino Real, #122, Sunnyvale, CA 94087. NCP

MacBooster is a disk-cache program that adds a great deal of operating speed to a 512K Mac. It installs easily from its master disk. This program can increase the speed of your 512K Mac by 2 to 3 times. \$50. Mainstay, 28611B Canwood St., Agoura Hills, CA 91301. NCP

Mac Disk Catalog is a utility that will quickly organize a moderate size disk library. It's easy to use and has powerful reporting and label-making features. \$39.95. New Canaan Micro-Code, 136 Beech Rd., New Canaan, CT 06840. CP

MacLabeler lets users instantly index and print labels for all the disks in a burgeoning collection. Choose border type and orientation of your label; index by folder or document. Starter set of labels is included. \$49.95. Ideaform, P.O. Box 1540, Fairfield, IA 52556. CP

MacLink lets users transfer data between Macs and PCs. Simple to install and run, high-performance software. Can do special format transfers such as 1-2-3 to *Multiplan* and *WordStar* or *MultiMate* to *MacWrite*. Contains both Mac and PC disks, interface cable is optional. Has Mac and MS-DOS disks. \$125, \$155 with 8-ft interface cable. DataViz, 16 Winfield St., Norwalk, CT 06855. CP?

MacMate combines RAMdisk and print spooling functions in a compact package. Both parts are efficient, work well and have on-screen help. This is the best product in its category. \$49.95. SMB Development Associates, PO Box 3082, Chatsworth, CA 91311. NCP

Mac Memory Disk creates a RAMdisk on 512K Macs. The RAMdisk's size is user selected up to 316K. Has auto startup and auto file transfer features. Simple to use, on-screen dialogs prompt for all actions. \$29. Assimilation, 485 Alberto Way, Los Gatos, CA 95030. NCP

MacNosy is a global disassembler. A very advanced user can use this program to look into the code of virtually any program. This advanced tool can take you places no other Mac program could dream of going if you have the skill to guide it. The documentation is sparse. For pros only. \$75. Jasik Designs, 343 Trenton Way, Menlo Park, CA 94025. NCP

The Macintosh Reference System consists of the contents of *Inside Macintosh* arranged into a simple database on a disk and a deck of 750 color coded cards that contain the same information. Very useful for programmers and developers.

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\$99.95. TOM Programs, # 34B, 1500 Massachusetts Ave. NW, Washington, DC 20005. NCP

MacZap is a three-part disk and memory utility. It can be used to recover some damaged files and disks, compare disks, analyze disk structure and make back-up copies of most disks. Fairly intimidating due to its enormous power. Has a good manual. \$60. Micro Analyst, 5802B Gloucester, Austin, TX 78723. NCP

Ncryptor is a simple, safe program that lets users password their files. The same program is used for encoding and decoding. This is the best product in its category. \$39.95. Mainstay, 28611B Canwood St., Agoura Hills, CA 91301. NCP

Packer is a simple utility that compresses files. It can be used to save disk space and also protect files. Packed files can also be password protected. Typical space savings range from 20 to 50% depending on the original file type and size. This is the best program of its type so far. \$29. Bobbing Software, 67 Country Oaks Dr., Buda, TX 78610. NCP

PC to MAC and BACK has both Mac and MS-DOS disks. This program easily and efficiently transfers text and other data between PCs and Macs. Easy to use, although not too intuitive. Fortunately, the documentation is excellent. Does special format transfers such as *WordStar* to *MacWrite*. Includes a cable for direct Mac to PC connections. \$149.95. dilithium Press, # 151, 8285 SW Nimbus, Beaverton, OR 97005. CP?

Quick & Dirty Utilities, Volume One is a disk chock full of the handiest programs you have ever bought. Included are a super disk cataloguer, a desk accessory mover and more. Several desk accessories including a menu bar clock and a terminal are on the disk. "Fileinfo" and "Q&D Filer" are two file management desk accessories that you'll wonder how you got along without. \$39.95. Dreams of the Phoenix, PO Box 10273, Jacksonville, FL 32247. NCP

Quick Disk is a RAMdisk utility. Users can create RAMdisks up to 350K on 512K Macs. Works well and has good documentation. \$34. Symmetry Corporation, # 103S, 3900 East Camelback Rd., Phoenix, AZ 85018. NCP

Switcher is Andy Hertzfeld's contribution to Mac productivity. This program lets users run several programs at once (up to 8 on a 1-megabyte or larger machine). Switching between the programs is near instantaneous. Slick and easy to use; every 512K Mac user should get it. Runs on 512K Macs and larger. \$19.95 from Apple, free from MAUG on CompuServe, from Delphi and included with some third-party applications (e.g., Excel). Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. NCP

TurboCharger is a disk-cache program. It works by storing frequently used portions of a disk in a memory buffer and it can dramatically speed up operation (250 to 500% improvements are common). Features include auto-startup and write buffering. Only works on a 512K Mac but is a must for one. \$95. Nevins Microsystems, 210 Fifth Ave., New York, NY 10010. NCP

TurboDownload is a desk accessory designed specifically to increase the speed of Xmodem data transfers from national databases to your Mac. Speed increases range upward from 50% to over 300% at 2400 baud. \$39.95. Mainstay, 28611B Canwood St., Agoura Hills, CA 91301. NCP

Twelve-C Financial Desk Accessory brings all the power and functionality of a Hewlett-Packard 12C programmable calculator to your desktop. Can be programmed and all registers can be viewed while calculator is running. \$39.95. Dreams of the Phoenix, PO Box 10273, Jacksonville, FL 32247. NCP

TypeNow is a desk accessory that allows the Mac and ImageWriter to function as an electronic typewriter. Type can be placed into blanks in complex forms easily. Typing can be recorded and played back or "boilerplate" stored and used as needed. \$39.95. Mainstay, 28611B Canwood St., Agoura Hills, CA 91301. NCP

XL/Serve converts a Mac XL into a disk and print server. Uses the AppleTalk network and is easily hooked up. Users can

partition the Mac XL's hard disk into multiple volumes (read-only for common access and read-write for private access). Runs in the background on the Mac XL, so users can work on all machines in the network. Comes with a backup and restore utility. \$195. Infosphere, 4730 SW Macadam, Portland, OR 97201. NCP

LANGUAGES

Aztec C is a C language program system that will appeal to users with a UNIX background. It uses many UNIX conventions and in the more expensive versions comes with standard UNIX utilities, including the VI editor. Good, solid system. \$199 basic system, can't produce standalone applications; \$299 development system, can produce standalone applications; \$499 commercial system, development system plus utilities and strong technical support by publisher. Manx Software Systems, PO Box 55, Shrewsbury, NJ 07701. NCP?

ExperLISP is a very buggy, but still incredibly useful, programming language for high-level programmers. The more you use it, the more you'll figure out about it. System crashes are too common for a language this useful and expensive. \$495. Requires 512K and either an external or a hard drive. ExperTelligence, 559 San Ysidro Rd., Santa Barbara, CA 93108. CP

ExperLogo is a version of the popular teaching language, Logo. Features three-dimensional graphics using "bunnies" rather than the usual "turtles." Very speedy, smooth program. Comes with an excellent manual. \$149.95. ExperTelligence, 559 San Ysidro Rd., Santa Barbara, CA 93108. CP

Hippo-C Level 1 offers a good basic learning environment for newcomers to the C programming language. The program's limits and restrictions are severe and standalone applications cannot be created. A good place to begin the study of C. Has a useful print spooler desk accessory. \$149.95. Hippopotamus, # 12, 985 University Ave., Los Gatos, CA 95030. CP

MacAsm is a software development system that allows programs to be written in assembly language. Programmers can assemble, edit and test software, and an integrated resource compiler lets independent applications run from their own icons. \$125. Mainstay, 28611B Canwood St., Agoura Hills, CA 91301. CP?

Mac C is a good, highly Mac-oriented implementation of this popular development language. Latest version has assembler and linker built-in. \$375. \$475 with Toolkit and floating point package. Consulair, 140 Campo Dr., Portola Valley, CA 94025. NCP

MacExpress is a development environment or shell. Programmers use it to save time and effort when developing standalone applications for the Mac. Easy to use for those with a strong technical background. \$50 test drive package, \$495. AL-Soft, Inc., PO Box 927, Spring, TX 77383. NCP

MacForth is an implementation of the popular Forth programming language. Level 1 is a simple, introductory version with limited support of the Mac ToolBox. Excellent tutorial and references sections in the manual. Level 2 supports the Mac Toolbox fully. Level 3 extends the language so that professionals can produce standalone applications. All levels are supported by the publisher via telephone and electronic BBSs (the publisher even has a private SIG on CompuServe). \$149 (Level 1), \$249 (Level 2), \$499 (Level 3). Creative Solutions, Suite 12, 4701 Randolph Rd., Rockville, MD 20852. CP

Mach1 is a multitasking implementation of Forth that allows local variables and text files. Several windows can be up with different operations in each, operating concurrently. Execution is fast. \$99. Requires 512K. Palo Alto Shipping, PO Box 7430, Menlo Park, CA 94026. CP?

Macintosh 68000 Development System is a fairly traditional assembly language package. The two-disk set provides an excellent editor (Edit), an efficient assembler, a linker, an



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MINIFINDERS

executive, a resource compiler called RMaker. The files included in this two-disk set have all the basic equates, process definitions, and trap calls. Good documentation includes a copy of the Motorola 68000 handbook. Also included is a copy of the "phonebook" edition of *Inside Macintosh*. \$195. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. NCP

Macintosh Pascal is Apple Computer's version of this very popular programming language. Loaded as it is with innovative teaching features, this interpreter is an excellent introduction to Pascal. Superb usage of the whole Mac interface makes this the best way to learn Pascal. The documents are mostly references, so get one of the tutorial textbooks in your bookstore. \$125. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. CP

Megamax C is an easy to use, full version of C. Has a compiler, linker, disassembler, editor and much more. Good for beginners. Excellent documentation. \$299.95. Megamax, PO Box 851521, Richardson, TX 75085. CP

Microsoft BASIC was the Mac's first programming language. This interpreter (it's not a compiler) now supports the Toolbox and the whole Mac interface can be implemented in your programs. For nonprogrammers there are lots of programs available (in user group libraries and magazines) to run. There have been several versions; be sure to get the latest. \$150. Microsoft, 10700 Northup Way, Bellevue, WA 98009. CP

Microsoft Logo, from Microsoft's MacLibrary, written by LCSi. An excellent implementation of Logo, taking full advantage of the Mac's user interface. Uses three windows. Turtle looks like a turtle, and its screen actions are very precise. Windows can be resized and moved about. \$124.95. Microsoft, 10700 Northup Way, Bellevue, WA 98004. NCP

QUED (Quality Editor for Developers) is the ultimate source code editor. Loaded with useful and well thought-out features, it will make any programmer's life much easier. It is not a word processor, however. \$65. Paragon Courseware, 4954 Sun Valley Rd., Del Mar, CA 92014. NCP

EDUCATION

A Bill Becomes A Law is a multiple-choice, role-playing adventure in which students try to pass a bill requiring apples in every federally sponsored school lunch. A good insight into political maneuverings on Capitol Hill for junior high and high school students. \$59.95. Queue Intellectual Software, 5 Chapel Hill Dr., Fairfield, CT 06432. CP

Astronomy is a low level package with basic features. Slow speed and sparseness of information makes this program of limited use to novices, but still useless to experienced astronomers. \$35. E & M Software Co., 95 Richardson Rd., N. Chelmsford, MA 01863. CP?

ChipWits is a combination game and teaching tool. Players create programs to maneuver robots through a set of 8 mazes. The programs are written in *ChipWit's* built-in icon-based programming language (IBOL). IBOL is a nearly perfect introduction to programming for nonprogrammers. \$49.95. BrainPower, 24009 Ventura Blvd., Calabasas, CA 91302. CP

Comet Halley is a single-purpose, single-minded program. It will indicate where in the sky users should look to see this pass of Halley's comet. That's it. When the comet is gone you can erase the disk. \$29.95. Great Wave, PO Box 5847, Stanford, CA 94305. NCP

MacChemistry is a two-disk set consisting of a titration program (predetermined compounds, not user modifiable), a periodic table program, *MacNest* (a scrapbook with indexing!), and a disk of *MacPaint* files depicting everything from lab equipment to molecular structures of many solutions and compounds. Advanced chemistry students will find programs shallow, *MacNest* is of general appeal. \$145. Fortnum, 31 W. Sierra Madre Blvd., Sierra Madre, CA 91024. NCP

MacEdge and **MacEdge II** each contain 8 reading or math drill

programs for basic skills. Programs follow one of three formats, a bit contrived. Contrivances are design flaws—they require learning format as well as skill. Exception is *Alphabet Train*, a clever game with great graphics and sound, poor font definition. \$49.95 each. Think Educational Software, 16 Market St., Potsdam, NY 13676. CP?

MacStrometry is a good package for novice sky watchers. Has expandable database of sky objects that can be customized by the user. Professionals may find some features lacking. \$75. Etion Software, PO Box 649, Lafayette, Co 80026. CP?

MacType offers structured typing instruction. Can teach both standard and Dvorak keyboards. Features include certificates for reaching certain levels. Can be used in a multistudent environment. \$49.95. Palantir Software, # 100, 12777 Jones Rd., Houston, TX 77070. CP

MasterType is proof that learning to type can be fun. In this arcade-style action game words descend from four corners towards the center ship; the user must type them correctly. Features 18 skill levels, tracks errors, recommends lessons and provides comparison scores. \$49.95. Scarborough Systems, 55 South Broadway, Tarrytown, NY 10591. CP

Mind Prober is a demonstration of a very simple expert-style system. How well do you know your friends? Answer certain statements as either true or false, and the computer prints a 3- to 5-page psychological profile of subject in business, stress, sex and other situations. \$50. Human Edge Software, 2445 Faber Pl., Palo Alto, CA 94303. CP?

Nutri-Calc uses a large database of nutritional information. Users can plan good, healthy diets and print out shopping and menu lists. \$79.95. CAMDE, 46 Prince St., Rochester, NY 14607. CP?

PowerMath is an equation solver. Handles problems ranging from the simplest to the extremely complicated. Step-by-step solutions make this a powerful teaching tool. Results can be displayed numerically or graphically. Slow, but potent program. \$99.95. BrainPower, 24009 Ventura Blvd., Calabasas, CA 91302. CP

Score Improvement System for the SAT is a no-nonsense drill and practice session covering practice tests, vocabulary, reading comprehension, algebra, geometry and quantitative comparisons. Excellent on-line tutoring for wrong answers. Result can be printed out with the *ImageWriter*. \$99.95. Hayden, 650 Suffolk St., Lowell, MA 01854. CP?

SmoothTalker trains your Mac to say anything you want. Users can program the pitch and tone of each syllable to simulate true speech patterns. Not too useful—but a lot of fun to play with! Latest version includes a female voice. Male and female can be mixed in same document to provide entertainment. \$149.95. First Byte Software, 2845 Temple Ave., Long Beach, CA 90806. CP

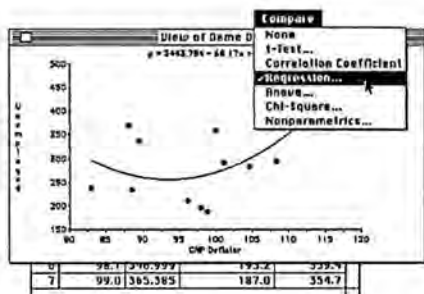
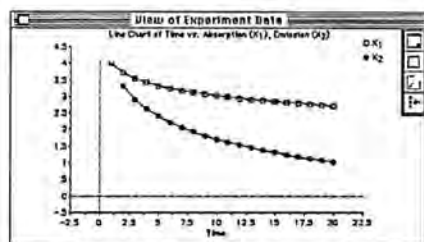
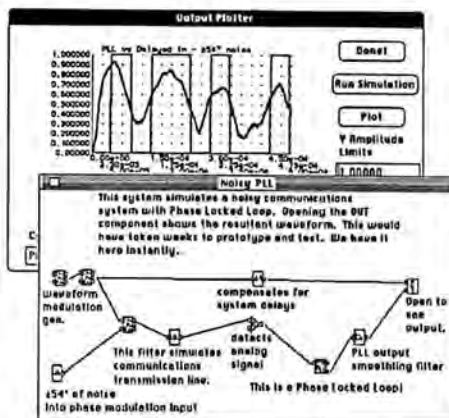
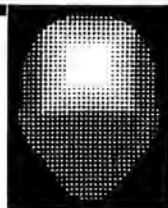
Spanish Grammar III is a teachers' tool consisting of ten modules for students who need tutoring in the Spanish language. Previous knowledge of the language is necessary. Uses multiple choice and fill-in formats. Keeps a Teachers Management Report for up to 40 names. \$34.95. Queue, 5 Chapel Hill Drive, Fairfield, CT 06432. CP?

Speed Reader II builds skills sequentially to develop faster, more efficient reading and improve retention. Scores kept, and can be graphed. High school level selections included, other levels available on data disks. \$69.95. Davidson & Associates, 3135 Kashiwa St., Torrance, CA 90505. CP?

Tellstar I & II are classics on other machines, best of the Mac lot. Has extensive database, quick sky plotting and can locate specific celestial objects. Level II has southern hemisphere star table, Messier objects. Good for both novices and advanced skywatchers. \$49.95 (level I), \$79.95 (level II). Spectrum HoloByte, 1050 Walnut, #325, Boulder, CO 80302. NCP

Think Fast allows users to improve their recall and recognition abilities. Tests include compare, copy and recall exercises. Users choose the level of difficulty, speed and risk-taking. Has session and summary reports to provide feedback and

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permanent records. Good for users of all ages. Children will find it fun. The manual is very clear. \$39. BrainPower, 24009 Ventura Blvd., Calabasas, CA 91302. CP?

Turbo Turtle is a turtle graphics program primarily designed as a learning tool for children. Uses Logo commands for graphics, but is not a full Logo implementation. Simple to use, good introduction to Logo for young children. \$59.95. Hayden, 600 Suffolk St., Lowell, MA 01854. CP?

ENTERTAINMENT

A Mind Forever Voyaging is a departure in text adventure games.

**** It has a more extensive vocabulary and a more involved story than most of the genre. The story here is gripping, but there are only a few puzzles to solve. Still this is a trip in the imagination well worth taking. Requires 512K or more. \$44.95. Infocom, 125 CambridgePark Dr., Cambridge, MA 02140. CP

Airborne is a classic arcade-style game with "real" sound effects.

*** The player sits at a gun position on a low rise and defends against an assault from flying enemies. Game noises digitized from actual recorded sounds add to the game. \$34.95. Silicon Beach, # 201, 11212 Dalby Pl., San Diego, CA 92126. CP

Amazon is an illustrated adventure authored by Michael Crichton.

*** Unravel the fate of a doomed expedition with the help of Paco the talking parrot. Three difficulty levels, good sentence parser. \$49.95. Telarium, One Kendall Sq., Cambridge, MA 02139. CP

The Ancient Art of War gives users a chance to refight some

**** famous campaigns on both strategic and tactical levels. Campaigns can also be designed from scratch. Very playable, adding game. Requires 512K Mac. \$49.95. Broderbund, 17 Paul Dr., San Diego, CA 94903. CP

Balance of Power is the world's first computer peacegame. This

***** simulation allows players to become either the President of the United States or General Secretary of the Soviet Union. Extraordinary artificial intelligence routines and general play make this a classic. \$54.95. Mindscape, 3444 Dundee Rd., Northbrook, IL 60022. CP

Baron is the world of real estate, in a financial simulation. Buy and

***** option properties in five key areas; invest in industrial, residential, or land property; or put cash aside in high-interest accounts. \$59.95. Blue Chip, 6740 Eton Ave., Canoga Park, CA 91303. CP

Championship Boxing allows statistical replay involving famous

**** boxers. Players can modify existing boxers and can create their own fighters. Good sound and graphics. Sierra, PO Box 485, Coarsegold, CA 93614. CP

Cutthroats casts players in this full-text adventure as a deep-sea

** diver, hired by a band of toughs to locate shipwreck treasure. The game is very closed-ended, requiring almost Pavlovian obedience. Multiple endings. \$39.95. Infocom, 125 CambridgePark Dr., Cambridge, MA 02140. CP

Cyborg is a text adventure game with an interesting twist. Robot

**** brain is implanted in concert with yours. It scans, evaluates, and reports, then carries out actions. Word and sentence understanding is very good. Absorbing game for adventurers. \$39.95. Broderbund, 17 Paul Dr., San Rafael, CA 94903. CP

Deadline is a text adventure in which the player is a detective

*** called in to investigate what seems like a simple drug overdose. The family lawyer thinks it was really a murder. You have 12 game hours to find the killer! \$49.95. Infocom, 125 CambridgePark Dr., Cambridge, MA 02140. CP

DejaVu is an unusually good version of the old card game

**** "Concentration." Great graphics and sound, one- or two-player modes. Improves concentration painlessly. \$39.95. Rubicon, 6300 La Calma Dr., Austin, TX 78752. CP

Deja Vu A: Nightmare Comes True is a graphic adventure that

***** breaks new ground. Innovative use of the Mac interface in truly playable and exciting game. A great introduction to

graphic adventure games. \$54.95. Mindscape, 3444 Dundee Rd., Northbrook, IL 60062. CP

Dinner at Eight is a useful recipe filing system that includes a collection of recipes from a nationwide sampling of restaurants. Users enter number of diners and program scales recipes accordingly. \$59.95. Rubicon, 6300 La Calma Dr., Austin, TX 78752. CP

Dragonworld is an illustrated adventure in which the player *** attempts to save The Last Dragon from the Duke of Darkness. Several on-screen illustrations at once. Outstanding documentation lists all words recognized by the program's sentence parser. \$49.95. Telarium, 1 Kendall Sq., Cambridge, MA 02139. CP

Fokker Triplane is about as near to flying as you can get seated in front of a computer. Very realistic simulation and excellent graphics. Well designed and implemented. \$39.95. PBI Software, 1155B-H Chess Dr., Foster City, CA 94404. CP

Forbidden Quest is a text adventure with pictures. Begins in a spaceship, with you in extreme danger. The game provides several levels of on-line help, from simple hints to actual solutions. The disk is accompanied by five graphic prints, called Artext, of specific scenes with hidden clues. Very playable if a bit mundane. \$44.95. Priority, 635 Sanborn Rd., Salinas, CA 93901. CP

Gateway, another Artext game, comes with 3 full-color prints. You *** inherit a boring old building from a supposedly rich uncle, eventually learning that the building is a "gateway" to a lost civilization. \$49.95. Priority, 635 Sanborn Rd., Salinas, CA 93901. CP

Gato puts players in command of an American submarine in World War II. This superb simulation game uses all of the Mac's graphic capabilities to really make you feel that "you are there." \$39.95. Spectrum Holobyte, # 325, 1050 Walnut St., Boulder, CO 80302. CP

Grid Wars is a three dimensional arcade style game. Good *** playability, but definitely meant for those that enjoy shoot-em-ups. Bizarre graphics. \$39.95. Ann Arbor Softworks, Inc., 308 1/2 S. State Street, Ann Arbor, MI 48104. CP

Gypsy is a computerized, customizable Ouija board. More than just a software package, users get a pasteboard playing surface and a Mouse Mover with 99 ball bearings. \$39.95. Magnum, #337, 21115 Devonshire St., Chatsworth, CA 91311. CP

Harrier Strike Mission pits you against a well defended island.

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Hippo Computer Almanac is a collection of interesting facts that *** users access using a question and answer format. This is a game or toy, not a real almanac. \$34.95. Hippopotamus, 985 University Ave., Los Gatos, CA 95030. CP

Infidel is a text adventure in which the player, left alone in the desert, must find and plunder a lost pyramid. Good sentence parser, bad Mac interface, twist ending. \$44.95. Infocom, 125 CambridgePark Drive, Cambridge, MA 02140. CP

Legacy is a two-part text/graphic adventure. A magical orb in Drab Castle must be found through the use of spells and careful adventuring. Well-constructed game and fun to play. \$39.95. Challenger, PO Box 1478, Homewood, IL 60430. CP

Lode Runner is a 150-screen action-strategy challenge that *** requires a joystick for truly effective play. Move around a grid of ladders and platforms collecting treasure; dig a hole to trap pursuers. Build your own challenges. \$39.95. Broderbund, 17 Paul Dr., San Rafael, CA 94903. CP

MacAttack puts the player in command of a super tank defending the wastes of Alaska against invaders. This 3D simulation pits you against attacking tanks and warplanes that fire heat-seeking missiles. Defeat the horde and get treated to a graphic fireworks display over the town. \$49. Miles Computing, # 212, 7136 Haskell Ave., Van Nuys, CA 91406. CP

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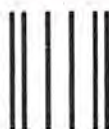
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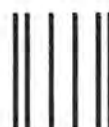
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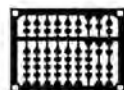
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MINIFINDERS

MacBackgammon with Cribbage provides graphic versions of these classic games. Variable skill levels allow the user to set game difficulty. At the expert level both games will challenge experts. The graphics are attractive but slow the games down quite a bit. \$49. Videx, 1105 Northeast Circle Blvd., Corvallis, OR 97330. CP

MacChallenger lets players land a space shuttle. The graphics of this flight simulator are crude and it's a hard machine to fly, but it's also a lot of fun. Version 2.0 lets you record your landing attempt (that's what most of them are!) and then review it from any of ten camera angles, a truly unique touch! \$49.95. Aegis Development, # 277, 2210 Wilshire Blvd., Santa Monica, CA 90403. CP

Macnooga Choo-Choo is a set of electronic toy trains. Run on the layouts provided, or create your own, as complex as you wish. Create scenery using built-in tools or import fancier MacPaint scenery. \$39. Fortnum, 31 W. Sierra Madre Blvd., Sierra Madre, CA 91024. NCP

MacJack II is a blackjack game pitting users against the house. Includes good graphics, insurance against dealer blackjack, splitting and doubling, and table limit that rises with your stake. The game plays very well, and can be quite addictive. \$39.95. DataPak, # 401, 14011 Ventura Blvd., Sherman Oaks, CA 91423. CP

MacVegas contains seven complete casino-style games: baccarat, blackjack, craps, keno, poker, roulette and slots. All are fairly standard but generally well designed. House rules can be altered by selecting establishment from a menu. The games are all fun to play, but not particularly absorbing. \$59. Videx, 1105 Northeast Circle Blvd., Corvallis, OR 97330. CP

Make Millions is a fascinating business simulation in which the player competes against the computer to take control of five companies, then run them profitably. Different strategic options and human-seeming associates make simulation more complete. Appeals to the closet capitalist in all of us. \$49.95. Scarborough Systems, 55 South Broadway, Tarrytown, NY 10591. CP

Millionaire is a financial simulation based on the stock market. "News" affects stock prices, so read it religiously. Turn a pittance into a fortune to win the game. \$49.95. Blue Chip, 6740 Eton Ave., Canoga Park, CA 91303. CP

Mind Over Mac features five games. Entertainment for the whole family. Good graphics paired with synthesized sound and on-screen help (each has a Rule menu). \$49.95. Think Educational Software, 16 Market St., Potsdam, NY 13676. CP?

NewGammon is animated backgammon that will challenge even good players. Features include variable skill levels and strategies and options to play the Mac or watch the Mac play itself. Many positions are included so that you can learn how to play them without having to set up a whole game. An arcade-like high speed play mode is also included. This is the best backgammon player currently available. \$39.95. Newsoft, PO Box 4035, Newport Beach, CA 92661. CP

Perplex is a board word game based on Scrabble. Players can vary the rules and board to suit their tastes and skills. Up to four can play and the game can either be an active player or a scorer and arbiter. Has a 90,000+ word dictionary and good graphics. \$39.95. Hayden, 600 Suffolk St., Lowell, MA 01854. CP

Pinball Construction Set lets users create their own pinball games, as elaborate or as easy as desired. Uses MacPaint for backgrounds and has lifelike sounds (on 512K Macs). No documentation to speak of. \$40. Electronic Arts, 2755 Campus Dr., San Mateo, CA 94403. CP

Planetfall leaves users shipwrecked on a seemingly deserted planet, with only Floyd the Droid to help figure out how to get home. Two possible endings. This full-text game is written in a tongue-in-cheek style. \$39.95. Infocom, 125 CambridgePark Dr., Cambridge, MA 02140. CP

Psion Chess is as good a micro chess player as you'll find. This 1984 World Micro Champion makes superb use of graphics

and the Mac interface. Switch between 6 languages for a touch of spice. \$59.95. Psion, 40 Lindeman Dr., Trumbull, CT 06611. CP

Real Poker is five-card draw against five other players with Old West names, distinct personalities and playing styles, in a saloon setting. Dealing and play are very fast. Game evaluates your hand, suggests cards to keep/discard. Dynamic, exciting, addictive game. \$39.95. Henderson Associates, 980 Henderson Ave., Sunnyvale, CA 94086. CP

Rogue is a strategy dungeon adventure in which each quest is completely different. Randomly generated rooms, monsters and treasures keep even veterans on their toes. \$39. Epyx, 1043 Kiel Ct., Sunnyvale, CA 94089. CP

Sargon III is a capable chess program with 9 levels of play, problem-solving modes, take back, change color, hint, manual play, etc. Easy Play option blocks Sargon from stealing search time during player's move, effectively doubling number of levels. Pieces are moved graphically. Disk stores 107 classic games for review and replay. \$49.95. Hayden, 600 Suffolk St., Lowell, MA 01854. CP

Strategic Conquest is a large scale, strategic conflict on the Mac. This very involved war game will be enjoyed by those who like this genre. \$49.95. PBI Software, 1155B-H Chess Dr., Foster City, CA 94404. CP

Suspended is Infocom's most unique text game. Using a small plastic board and six markers, the player keeps track of six uniquely designed robots which check on damage to a complex's machinery and report back what they perceive as the problem. \$49.95. Infocom, 125 CambridgePark Dr., Cambridge, MA 02140. CP

Tycoon is a financial simulation based on the ups and downs of commodities market. Build a fortune in pork bellies and Swiss francs, checking the "Financial Journal" for news affecting the market. \$59.95. Blue Chip, 6740 Eton Ave., Canoga Park, CA 91303. CP

Ultima II players take the part of a character who travels through land, sea, air, space and even time itself in a quest to find and defeat the evil sorceress Minax. Good Mac interface; excellent game; confusing graphics. \$59.95. Sierra, PO Box 485, Coarsegold, CA 93614. CP

Ultima III allows up to four characters to cooperate to explore the vast wilderness of Sosaria; dungeons, oceans, and the Moon Gates to help solve the adventure. \$59.95. Origin Systems, 340 Harvey Rd., Manchester, NH 03103. CP

Universe 2 is the most complete space adventure yet created. It has so much data that it requires 3 disks! Good, playable game, marred by poor parser in the text adventure sections. Requires 512K. \$69.95. Omnitrend, PO Box 3, W. Simsbury, CT 06092. CP

Webster's Revenge is a Boggle-like word search game. Super graphics make it a pleasure to play. The dictionary is adequate and the user can always overrule it if necessary. Multiple skill levels make this a game for all. \$34.95. Shapechanger Software, 113 E. Tyler, Athens, TX 75751. CP?

Winter Games lets up to eight players compete against each other in Olympic events including figure skating, bobsledding, biathlon and ski-jumping. Mouse and keyboard controls this action game. Excellent animation, good graphics, good theme music. \$39. Epyx, 1034 Kiel Ct., Sunnyvale, CA 94089. CP

The Witness is a full-text adventure that casts the player as a detective assigned to get to the bottom of a death threat. When the victim is killed, you have only one night to find the real guilty party. \$39.95. Infocom, 125 CambridgePark Dr., Cambridge, MA 02142. CP

Wizardry is an outstanding dungeon exploration adventure pitting a party of up to six characters against the guardian monsters of the evil wizard Werdna. Capture his amulet to earn your reward. Even after solving the game, you'll want to go back into the dungeon. \$59.95. Sir-Tech, 6 Main St., Ogdensburg, NY 13669. CP

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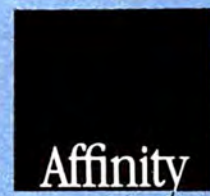
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Word Challenge is a *Boggle* lookalike. Features multiple (26) skill levels and an extensive dictionary. Even "pro" *Boggle* players should find a level that will challenge them. New version has improved graphics. \$39.95. Hayden, 600 Suffolk St., Lowell, MA 01854. CP

WordPlay is a word game with over 50 crossword puzzles for different levels of expertise. User friendly, it offers on-screen Help menus. A Work mode allows development of new puzzles for the creative. \$49.95. Palantir, 12777 Jones Rd., Houston, TX 77070. NCP

Xyphus is a role-playing game pitting four characters (fighters or wizards) against multiple scenarios that grow increasingly harder. Excellent Mac interface and icon control. \$39.95. Penguin, 830 Fourth Ave., Geneva, IL 60134. CP

Zork I is a full-text adventure game that lets players explore a strange underground empire. Parser understands full sentences; players can take many different routes to final success. Beware of the thief, who steals random objects. The ultimate text game. \$39.95. Infocom, 125 CambridgePark Dr., Cambridge, MA 02140. CP

Zork II is where the adventure continues in the underground empire. A wandering wizard keeps things interesting, though there's a way to beat him if you persevere. \$44.95. Infocom, 125 CambridgePark Dr., Cambridge, MA 02140. CP

Zork III is the final chapter in the trilogy. Players come up against the ultimate enemy—the Dungeonmaster himself. More closed-ended than previous *Zorks*. \$44.95. Infocom, 125 CambridgePark Dr., Cambridge, MA 02140. CP

MUSIC

ConcertWare+ is an enhanced version of *ConcertWare*. Has different instruments and the ability to use any four of a set of eight at any point in a musical piece. Can read and use *ConcertWare* and *MusicWorks* files. The best program for those who want to listen to music on the Mac. \$69.95. Great Wave Software, PO Box 5847, Stanford, CA 94305. NCP

Deluxe Music Construction Set; an active piano keyboard and instant audio feedback make this program perfect for educational applications, and the advanced notational capabilities will satisfy most advanced musicians. \$50. Electronic Arts, 2755 Campus Dr., San Mateo, CA 94403. CP

MusicWorks allows the user to create and play simple musical compositions. Music entry is by either a grid or a staff and is very easy. Users can select various instruments and modify each to produce new effects. Compositions are limited to 64 measures and overall limitations make this a beginner's program. There are many public domain music files available to play. The manual is clear and thorough. \$79.95. Hayden, 600 Suffolk St., Lowell, MA 01854. CP

Professional Composer is aimed at music professionals. Produces performance-quality sheet music; has only limited playback facilities. \$495. Mark of the Unicorn, 222 Third St., Cambridge, MA 02142. CP

HARDWARE & ACCESSORIES

A+ Mouse is a replacement mouse. It works by optical tracking on a special mousepad. Good choice if the original mouse fails. \$99. Mouse Systems, 2336H Walsh Ave., Santa Clara, CA 95051.

The Easel is a compact and portable carrier for up to 20 disks. Can be converted into a standup rack for desktop use. Solidly made, attractive and useful. \$19.95. Innovative Technologies, 5731 La Jolla Blvd., La Jolla, CA 92037.

Ergotron is a Mac (and external drive) holder that allows a full range of swiveling and tilting. Very strong, this well made unit is also very easy to use. \$99.95. Ergotron, PO Box 17013, Minneapolis, MN 55417.

Hard Disk 20 is Apple's entry in the exploding hard disk sweepstakes. This quiet, small unit uses Apple's new Hierarchical File System (HFS). It is a pleasure to use and will perform

even better when the new ROMs are available. The lack of utility software (spooler, backup, security) is its only drawback. \$1499. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014.

HyperDrive HD20 is an internal 20-megabyte hard disk. It only adds about 5 pounds to the Mac's weight. Good, full featured unit with all common utilities: spooler, security program and backup utility. It could use memory a bit more efficiently, and it remains to see how well it will work with Apple's new HFS. \$2195 installed in a 512K Mac. General Computer Company, 215 First St., Cambridge, MA 02142.

MacCharlie is one of the most unusual Mac products imaginable. Its components slip around the Mac and the keyboard and convert the Mac into an IBM PC clone. Amazingly it works well. The enlarged keyboard has a few bugs but is a joy to use. \$1,195 with 256K RAM and one floppy drive. \$1,895 with 640K RAM and two floppy drives. Dayna Communications, 50 S. Main St., Salt Lake City, UT 84144.

MacIntizer is a graphics tablet and absolute positioning device that replaces the mouse. Various scales are possible. \$599. GTCO Corp., 1055 First St., Rockville, MD 20850.

MacNifty Stereo Music System converts Mac sounds to simulated stereo by splitting highs and lows between two powerful speakers. User controls bass, treble, balance, low and high impedance output, and most importantly, volume. Hear your music compositions the way they were meant to be played. \$79.95. Kette Group, 13895 Industrial Park Blvd., Minneapolis, MN 55441.

MacNifty Switch allows any port on your Mac to connect to two peripherals. Turn the knob to switch between the two devices. Plugs are friction-fit, not screw-fastened like most Mac peripherals, so in some cases may loosen by themselves. \$34.95. Kette Group, 13895 Industrial Park Blvd., Minneapolis, MN 55441.

MacTablet is a stylus-driven graphics tablet. Users can easily sketch or trace art using this absolute-positioning device. Has a working area the size of the Mac screen. Allows concurrent use of the mouse. \$495. Summagraphics Corp., 777 State St. Extension, Fairfield, CT 06430.

Mac Turbo Touch is a mouse replacement device. Features include 2.5-inch diameter track ball with control buttons to either side. Users either love it (and refuse to use anything else) or hate it; very few so-so's on this product. Takes a few days to get used to. \$129. Assimilation, 485 Alberto Way, Los Gatos, CA 95030.

MacVision is a digitizer that uses an ordinary video camera for input. Capable of extremely fine results and special effects. Easy to use and well documented. \$399.95. Koala, 3100 Patrick Henry Dr., Santa Clara, CA 95052.

Magic is both the most intimidating and easiest to use digitizer available. Use a regular video camera for input. Once the crowded screen is mastered, any effect is possible. \$399, \$549 with camera. New Image Technology, # 104, 10300 Greenbelt Rd., Seabrook, MD 20706.

Mousetrak is a fabric covered foam mousing pad. It will increase the efficiency of your mouse while helping to keep it clean. Pad comes in a variety of colors. Particularly useful in the typical office desk top environment. \$10. Moustrak, # 503, 1 Weatherly, Mill Valley, CA 94941.

Numeric Turbo combines a track ball with an enhanced numeric keypad. The keypad includes working cursor keys and other direct function keys that bypass the Mac's Command and Shift keys. The track ball takes some getting used to and some never learn to like it. Those who do rarely ever use a mouse again. \$149. Assimilation, 485 Alberto Way, Los Gatos, CA 95030.

ThunderScan replaces the ribbon cartridge in an ImageWriter, which is required to use it. Laser scans art that can be run through the ImageWriter, producing high-quality digitized images. The images can be manipulated as they are created or afterward. Output has been optimized for LaserWriter. \$229. Thunderware, 21 Orinda Way, Orinda, CA 94563.

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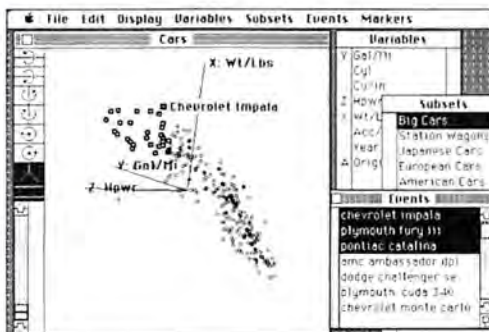
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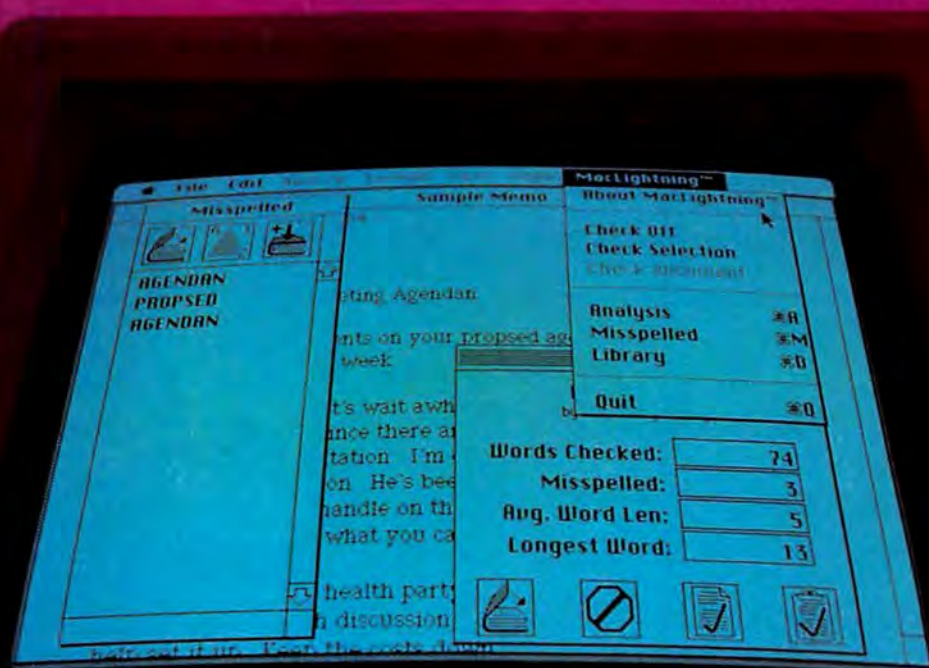
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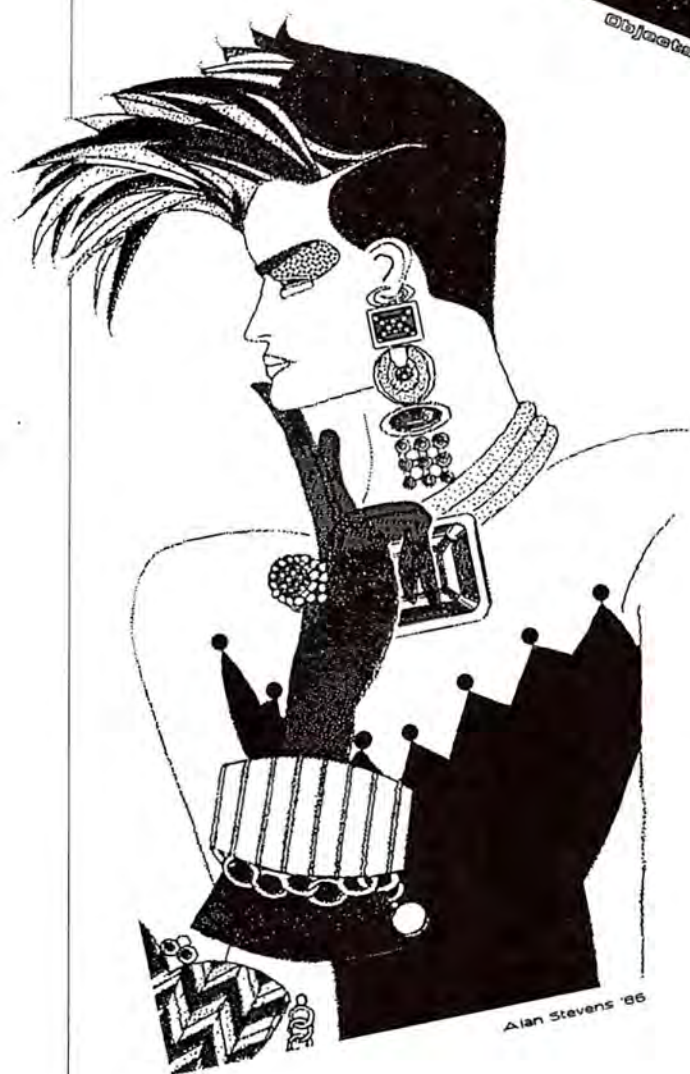
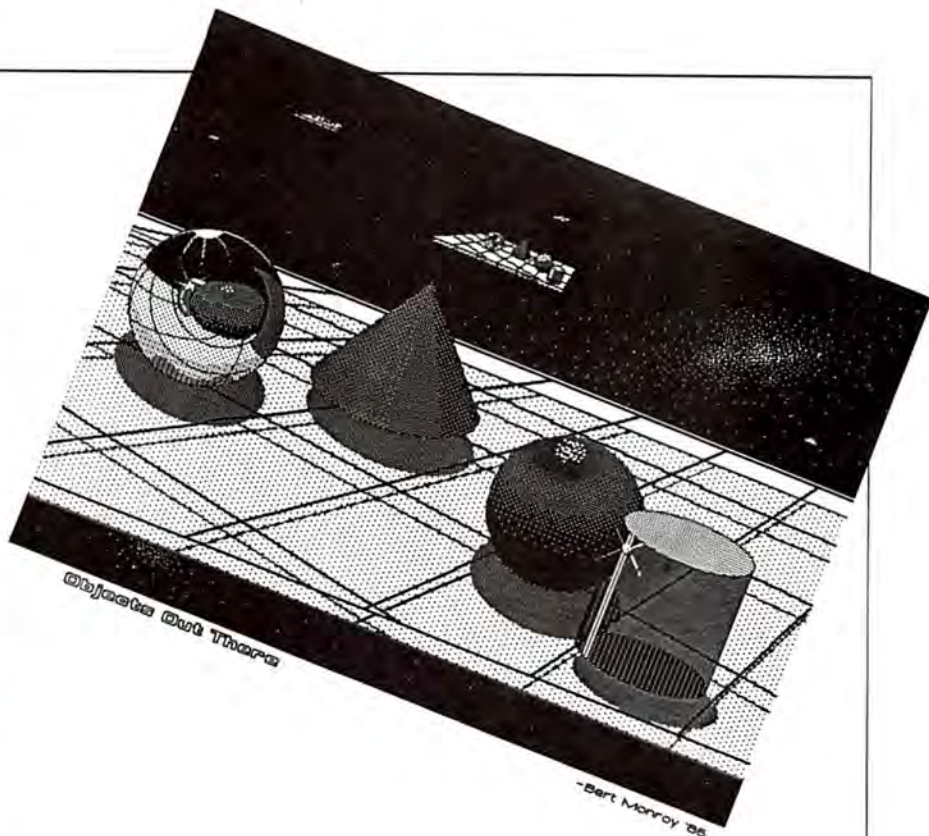
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THE AMAZING NEW MACINTOSH!

by John C. Dvorak

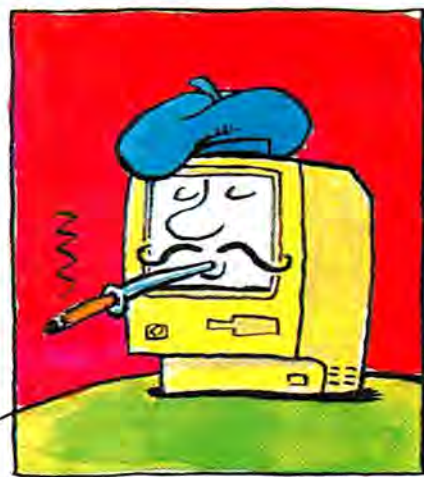
THIS column consists mainly of speculation, but sometimes I hear a story that bears repeating. In the case of the secret French Macintosh, the story bears repeating over and over. It seems that for over two years Apple has been using the services of Jean Leon Letni, a French computer designer and noted physicist. He's the French equivalent of Alan Kay and I'm told he and Kay communicate often about the best design for the next generation of personal computers.

IS it enough to say that amongst the cognoscenti, Jean Leon (as he is called) is as well-known as Seymour Cray? He has been used by nearly every major mainframe manufacturer as a consultant. He supposedly ironed out some throughput bugs in the new IBM 3090 machine and has worked with the Russians on a supercomputer of some sort. The connection with Apple is a little mysterious, but I've been able to gather enough facts to piece together a scenario that will give us some idea as to Apple's plans for the future.

AN abstruse memo sent to me by an insider at Apple concerning Apple's ownership of a 105-foot yacht named the Apple Europa turned me on to the whole story. The boat is anchored near St. Tropez in the south of France. I sent the memo to a friend of mine who works for Computerland in Europe to check this out and he confirmed that Apple does indeed have a huge motor-powered yacht in the Mediterranean. On board is a satellite uplink and an entire development team headed by Jean Leon. It turns out that Jean Leon is good friends with Jean-Louis Gasse and that connection is the main reason Steve Jobs (who had somehow met Jean Leon in Paris while on a junket) hired Gasse.

APRIL, 1986 was supposed to be the date that a new generation of computers was to be announced, according to my sources. The new generation was supposed to be designed by these French-

men. The original notion was that the Macintosh by then would have supplanted the Apple II as the bread and butter computer and the Jean Leon machine (dubbed the "Sylvie") would be introduced as Apple's entry into the personal workstation market. It would be a direct competitor with Sun and Apollo Computers at a third of the price. Now it seems that this machine may never be released, especially since Steve Jobs is gone and John Sculley has been fighting with Jean Leon over the specifications of the computer. Over the past six months the relationship between the French design team and Apple has been strained, to say the least.



"FOOLS, idiots, jerks," is what Jean Leon calls the Apple Corporate people. "Dreamer, money-waster, phoney," is what Apple executives call Jean Leon. Currently there is a closed door battle in Cupertino over the expenses that the 105-foot Apple Europa is racking up monthly. I'm told that on board, Dom Perignon and Lafite-Rothschild flow like water. Apparently the brouhaha over expenses stemmed from a phoney expense report sent to Cupertino one month. Among other things it listed a wine expense of over \$10,000 for one party!

JOKE or no joke, the whole operation is under review and it's possible that the Sylvie may never appear or be completed.

I heard that the Sylvie is a 1024 x 1024 full-color machine with three processors. Jean Leon is supposed to be some sort of genius with parallel processing. It has three 68000 chips. One for I/O, one for the screen and one for data

manipulation. The machine uses all high speed components and operates at one megaflop speed. It comes with 10 megabytes of main memory and it's supposed to sell for less than \$3000.

MEANWHILE, there is a big battle over two issues. It seems that Alan Kay and Jean Leon are convinced that new algorithms will make voice recognition a reality, so there will be no need for a keyboard. For CAD/CAM use, the mouse will do all the work. Sculley thinks it's idiotic to even consider producing a machine without a keyboard.

CAN you imagine a machine without a keyboard? I've heard that demos done by Jean Leon include putting a keyboard on the screen and then typing on it with the mouse. Needless to say, Sculley will fight this dumb idea.

HOPE for a keyboard, folks! Then again, the keyboard issue may just be a smokescreen for the real problem between Sculley and Jean Leon. It seems that Sculley is so hot on making this machine IBM compatible that he insists that it have a fourth processor—an Intel 80286 or, better still, a 80386. Jean Leon is dead set against IBM compatibility in this way.

TO make the computer IBM compatible with another chip would screw up his efficient design, or so the story goes. This additional chip means that the machine will cost more and provide only a marketing gimmick.

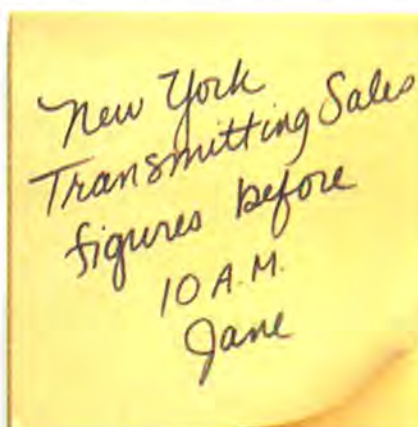
DELUDE the user with emulation, perhaps? That seems to be what Jean Leon wants to do. Sculley's advisors have convinced Sculley that an Intel chip has to be on-board. Emulation never works right and it's a software bottleneck. Fortune Systems guys used to tell me how they were going to emulate all kinds of things with their 68000, including the Apple II and the IBM PC. Needless to say, it never happened.

A person with experience in this industry soon realizes that there is computer-assisted design to help build boards and design chips, but we do not have similar tools for software development. That's why software lags so far behind. So maybe the fourth processor is the way to go.

FEW, if any, Apple executives are siding with Jean Leon on this issue or on the keyboard issue. Apparently this has the Frenchman up in arms. Meanwhile the April date is long forgotten.

READERS may get lucky and get to see a prototype in Las Vegas at next fall's COMDEX. Have a nice day. ☺

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