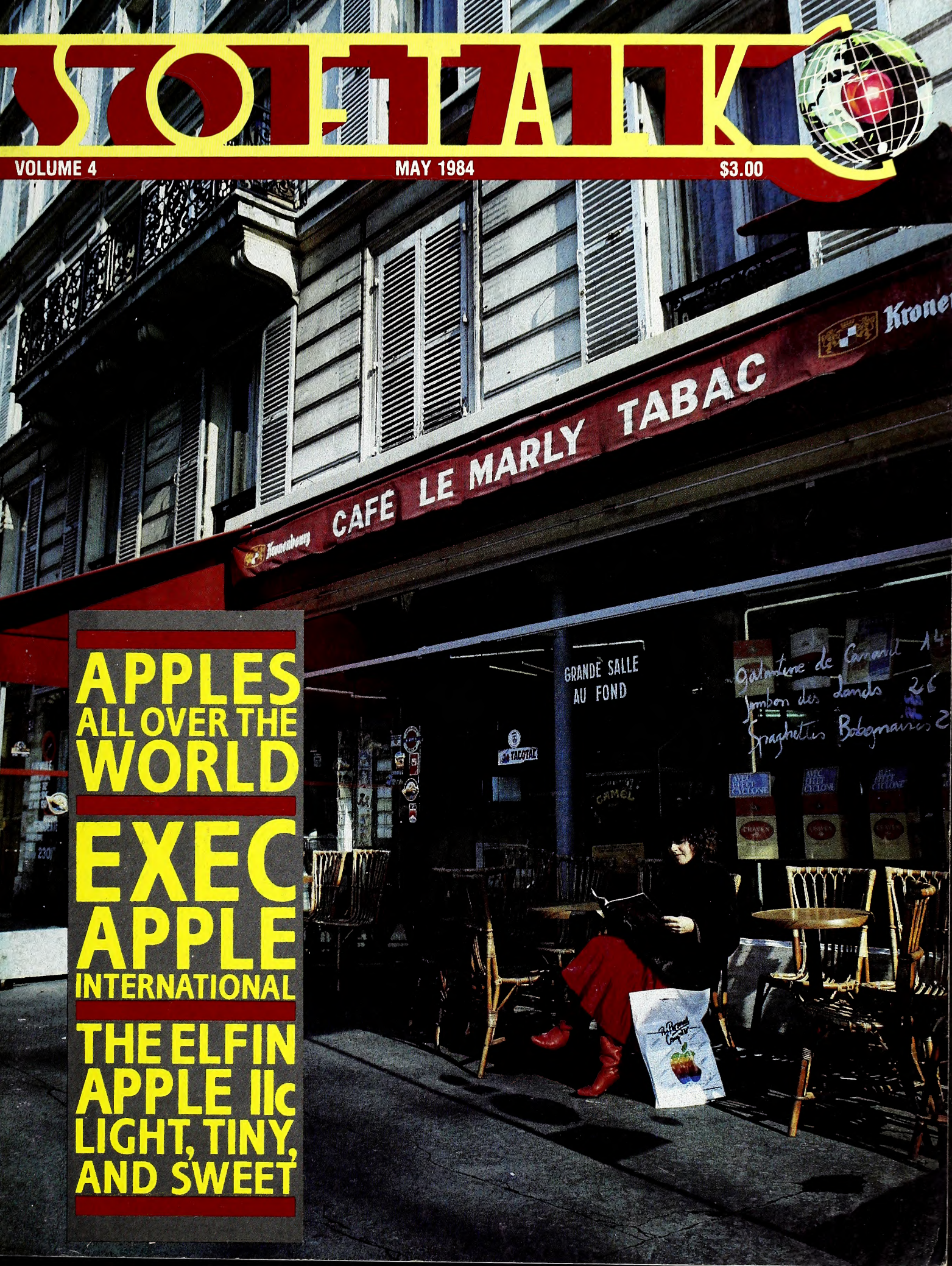
SOFTALK

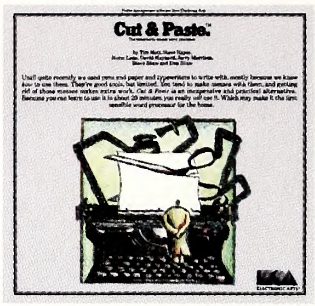
VOLUME 4 MAY 1984 $3.00



APPLES ALL OVER THE WORLD

EXEC APPLE INTERNATIONAL

THE ELFIN APPLE IIc LIGHT, TINY, AND SWEET



If you can learn to use this word processor in 90 seconds, can it really be any good?

CUT & PASTE™ *displays its commands on a single line at the bottom of the screen. This makes working with it easier and also gives you more usable space on the screen.*

Of all word processors on the market today, Cut & Paste may well be the easiest to use. In fact, by the time you finish reading this section of the ad, you'll know how to work with Cut & Paste. So read on.

START TYPING. Working with Cut & Paste is like working with a typewriter. If you know how to use a typewriter, you already know how to type in your draft with Cut & Paste. The only real difference is, with Cut & Paste it's easier to correct typos.

MAKING CHANGES. Let's say you've decided to make a cut in your rough draft. To do this you put the cursor (the bright block) at the start of the text you want to delete, and stretch it through to the end of your cut. Then you send the cursor down to the "CUT" command on the bottom of the screen. Done.

If, on the other hand, you want to keep that line, but put it in a different part of your draft, you use the "PASTE" command. You mark the point of insert with the cursor. Then you put the cursor over "PASTE." That's all there is to it.

PRINTING IT OUT. When you like the way your work looks, you print it. Put the cursor on the "PRINT" command. Then set your margins, in inches. That's it.

You now know how to use Cut & Paste.

OKAY, IT'S SIMPLE. BUT HOW GOOD IS IT? Cut & Paste has all the features you'll ever need to use at home. Here are a few of them:

1. Scrolling dynamic menus
2. Automatic word wrap
3. Simple cut & paste editing
4. Block indenting
5. Set margins and paper size in inches
6. Tabs
7. Automatic page numbering
8. Controllable page breaks
9. Headings
10. Scrolling text windows
11. Automatic widow and orphan control
12. Clear and concise manual

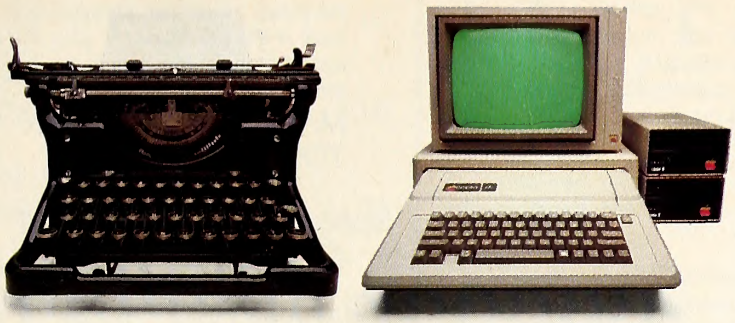
In other words, Cut & Paste will do just about everything other word processors do. But Cut & Paste will do it more easily. Without complex commands and modes.

If you think about a word processor in terms of what it replaces (typewriters, pens and paper, files), Cut & Paste begins to look very good indeed.

And when you consider that *all this power can be had for approximately* $50, we think you'll see why we believe Cut & Paste is something of an achievement.

A PHILOSOPHY OF DESIGN. The people who designed, developed and programmed Cut & Paste have some fairly heavy credentials.

They are people who worked on the internationally-famous user interface designs that led to the Xerox Star® and Apple's Lisa.® They are also



Now Supports Apple IIc and AppleMouse.

THE CHANGING OF THE GUARD. *Until quite recently we used pens and paper and typewriters to write with, mostly because we knew how to use them. They have been good tools, but limited. You tend to make messes when you work with them, and getting rid of those messes makes extra work. Cut & Paste is an inexpensive and practical alternative. Because it is as easy to use as a typewriter, you really will use it. Which may make it the first sensible word processor for the home. Thus an alleged labor-saving device has come to a position where it really can save a significant amount of labor, i.e., yours.*

THE MEN WHO MADE CUT & PASTE. *The Linotype machine pictured here was the 19th century's most important contribution to word processing technology. It let typesetters compose and rearrange text in the form of metal castings. The importance of Cut & Paste, of course, must await the judgment of history. Nevertheless, the seven men who developed it look confident here. Standing left to right, they are: Norm Lane, Steve Shaw, David Maynard, Dan Silva, Steve Hayes and Jerry Morrison. Seated at the console is Tim Mott, whose idea this was in the first place.*

people who have in common a very lucid philosophy of design.

Computers and the programs they run are tools, they believe. Tools are never noticed unless they are bad tools. When they're good, they become, in effect, invisible. And if you want to make a good tool—an invisible tool—you'd best study the way people use the tools they already have.

As a result of this thinking, Cut & Paste was designed to work much in the same way that you already work with a typewriter or with pen and paper. The most complex and powerful parts of the program are hidden from view. The work they do takes place deep in the machine. All you get to see are the results.

But beyond that, there is something almost indefinable about a good design. Things about it just seem to work crisply. Little touches and features that you notice make you want to smile. If it's really good, it *feels* good.

Cut & Paste feels good.

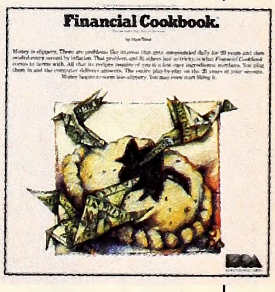
ELECTRONIC ARTS™

THE PRODUCTS *of Electronic Arts can be found in your favorite computer stores, software centers, and in leading department stores throughout the country. Both Cut & Paste and Financial Cookbook™ are now available at a suggested retail price of $50 for the Apple IIe and the Commodore 64 and will soon be available for the IBM-PC and Atari.*

OUR COMMITMENT TO HOME MANAGEMENT.

Cut & Paste is just one of a growing number of products we're publishing within the category of "home management software." These products are all built around the same program architecture, making them all equally "friendly," as well as remarkably straightforward and practical. We believe that designs like these will soon make home computers as functional and efficient as today's basic appliances.

Our next product in this line is called *Financial Cookbook*. It's a realistic alternative to the complex, pre-programmed financial calculators we all wish we knew how to use. With a few, simple keystrokes, *Financial Cookbook* lets you make more than 30 key time-value-of-money computations—just about all the ones you'd ever use for personal finances—like calculating mortgages with changing interest rates, compounding the interest on IRA and savings accounts, and buy-versus-lease comparisons for automobile purchases.



To find out more about these home management products and about what we have planned for the future, call or write: Electronic Arts, 2755 Campus Drive, San Mateo, CA 94403 (415) 571-7171.

SOFTALK
MAY 1984

DEPARTMENTS

PREVIEWS

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On Our Cover: Among spring fashions and blossoms, Apples are part of the Parisian scene. The French and a growing number of international computerists are making the Apple a worldwide phenomenon. Photo by David Hunter.

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Back Issues: $2 through February 1981; $2.50 through July 1981; $3.50 through September 1982; $4.00 thereafter. November and December 1980, January, February, March, September, October, and November 1981, and December 1982 are sold out. December 1981, February and May 1982, and February and December 1983 are in short supply.

Problems? If you haven't received your *Softalk* by the fifteenth of the month, or if you have other problems with your subscription, Marsha Stewart can help out. Call (818) 980-5074 or (800) 821-6231.

Moving? Send new address and a label from a recent *Softalk* to Softalk Circulation, Box 7039, North Hollywood, CA 91605; telephone (818) 980-5074. Please allow six to eight weeks for processing.

Illustration by Dan Winkler

CONTEST:

Gravy-Boat Diplomacy

Have you been yearning to get out of the house and see the world? Well, here's the chance of a lifetime—we're giving you an ambassadorial post! Congratulations, and may you serve your country well. As of today, you are the ambassador to Albania. Your first official duty is hosting a dinner party for the faculty of the International Academy of Computer Arts and Sciences, which convenes in Albania for two weeks each May.

An hour before the guests arrive, your aide confesses that he has lost the seating arrangements for the evening. Fine, you say, just seat them boy-girl-boy-girl. Your aide pales and tells you that it isn't that easy—you have to consider protocol. First, many faculty members are bringing their spouses, and protocol says that no one may sit across from his or her spouse. Second, to facilitate conversation, each person must sit across the table from a person who knows a common human spoken language. And third, no man may sit next to another man.

You must reseat the guests. The table is rectangular, there are sixteen places, and no one sits at the head or the foot. Also, the four persons sitting at the ends can be considered to sit next to only one person. The protocol and the information you have from the dossier on each guest are your only means to make arrangements that will keep each guest happy.

The Professor from Albania
The Professor from Brazil
The Professor from Czechoslovakia
The Professor from Egypt
The Professor from Finland
The Professor from France
The Professor from Germany
The Professor from Mexico
The Professor from Nepal
The Professor from Portugal

They all will attend. Seven of the professors will be accompanied by their spouses. Including yourself, sixteen people will attend.

You have a bit more information in the dossiers in your diplomatic pouch. You know that each person knows the language of his or her native country. You also know that each person knows the same language as his or her spouse. Each of the professors is of the same nationality as his or her spouse, except for two.

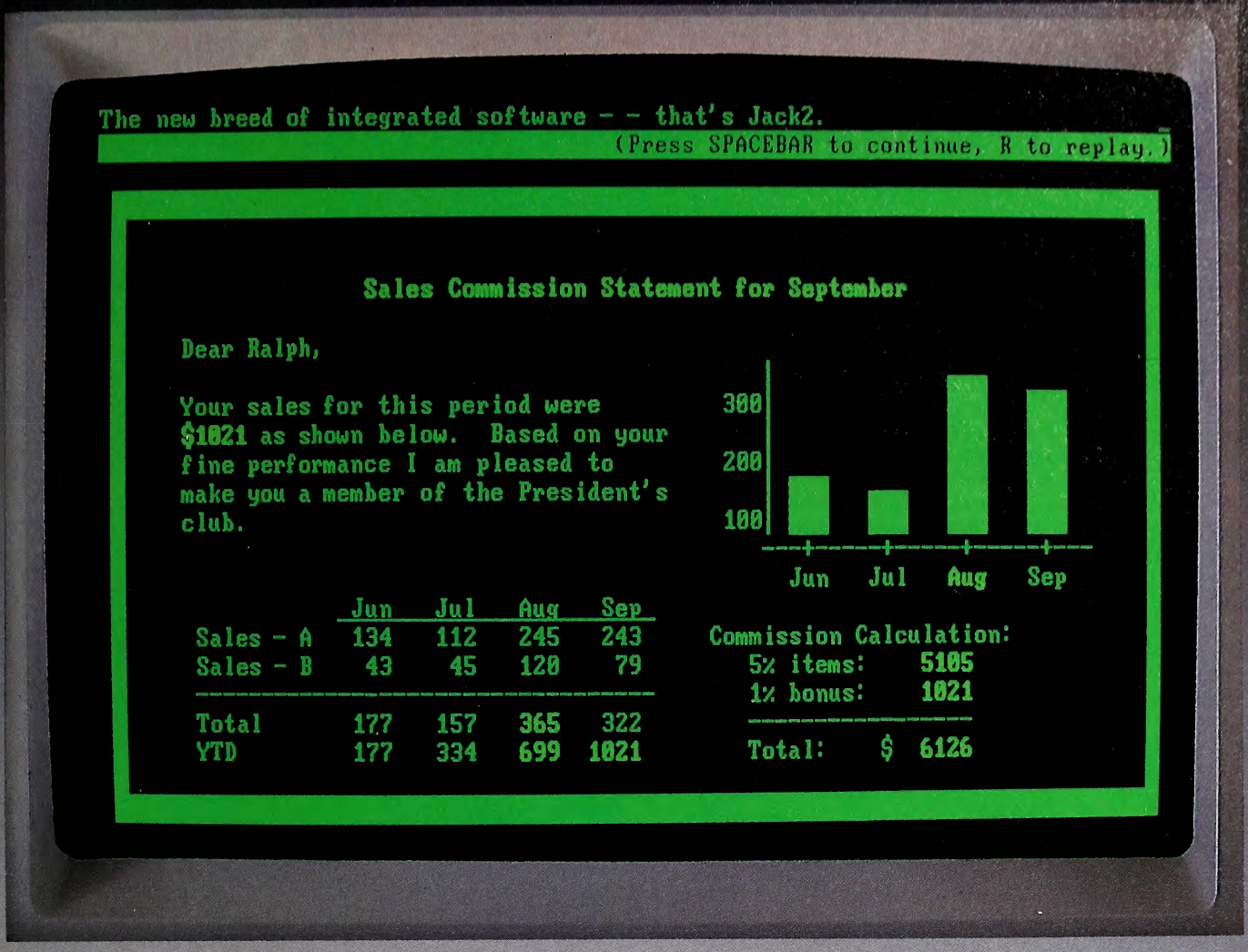
For security reasons, you must sit between the professors of Czechoslovakia and Finland.

The professor of Floating Point Basic will not sit next to or across from the professor of Integer Basic. The professor of Pascal will not sit next to or across from either of them.

The spouse of the professor from France is jealous and must sit next to the professor—and furthermore will not let the professor sit across from a person of the opposite sex.

The spouse of the professor from Brazil and the spouse of the professor from Albania are best friends and like to sit across from one another.

Four professors do not know Albanian.
Four spouses do not know Albanian.
The professor from Portugal knows Italian.
The professors of Assembly Language,



JACK2. THE BEST PC INTEGRATED SOFTWARE YOU CAN FIND. NOW YOURS ON THE APPLE IIe.

With JACK2, you can do word processing, spreadsheets, data base management, charting. All at the same time. On the same screen. Without changing diskettes or exiting programs.

And, you can print out what's on your screen – text, calculations, and graphs – on the same page. What you see is what you get!

No need for windows. Additional monitors or hardware of any kind. No need to close one file before you open another. JACK2 is as easy to master as it is powerful to use.

Picture a screen that graphically displays your disks and names them. With envelope icons that can be scrolled up or down from 1 to 50 showing you all your files. JACK2 will even show you the forms inside your envelopes. And then let you choose the one you're looking for simply by pointing to it. All commands are in English. All are displayed on a single line and all have the same function throughout JACK2.

So, if you've been searching for a new breed of integrated software, you've found it. From word processing, to spreadsheets, to data base management and charting only JACK2 will let you do everything you've always wanted to do. On the same screen. At the same time.

Jack2

JACK2 is available for the Apple IIe with extended memory, 80-column card (total of 128k) and two Apple disk drives.

Business Solutions, Inc.
60 East Main Street, Kings Park, NY 11754 • (516) 269-1120

Microcomputing, Fortran, and Robotics are women.

The professor of Floating Point Basic knows English.

The professor of Robotics knows French.

The professor of Assembly Language is the only professor who knows Spanish.

The professor of Logo sits across from the spouse of the professor from Finland.

You know only English, and you are the only person who knows only one language.

Only two people know more than two languages.

The professor from Nepal prefers to sit between the spouse of the professor from Finland and the spouse of the professor from Mexico.

The professor from Egypt is married and likes to sit next to his spouse, who likes to sit across from the professor of Fortran.

As the ambassador, you must sit on the right side of the table.

The professor from Czechoslovakia knows neither English nor Albanian.

Four of the conversations across the table will be carried out in Albanian.

None of the conversations across the table will be carried out in German or Arabic.

The professor from Germany knows Arabic.

The professor of one of the Basics is from France.

The professor of Cobol knows German and Albanian and is a married man.

The professor of Pascal knows Portuguese.

The professor of Logo, the professor of Fortran, and the professor of Microcomputing all know Albanian.

The professor of Microcomputing knows German.

The professor of Artificial Intelligence is a widower and knows Italian.

The professor of Integer Basic is from Finland.

No one who knows French knows Albanian, and no one who knows French will sit next to anyone who knows Portuguese.

Decide where your guests are to be seated, their gender, in what language they will converse with the person across from them, and the discipline of each professor. Then write it all down and send it to Embassytalk, Box 7039, North Hollywood, CA 91605. Those who get it all correct will advance to the most diplomatic random number generator for a shot (heard 'round the world) at prizes befitting their station. And pass the peas. ◨

CONTEST WINNERS

February's Phonies contest was one that should have satisfied all those contest fanatics who have been crying, "Harder contests!" for the past few months.

Everybody solved some of the puzzles, most contestants solved most of them, and a few got them all correct. From the few perfect entries arose one entry screaming, "Hey, I wanna win, I wanna win!" The sight of a piece of paper screaming like a lunatic caused everyone in the room to run away, thinking the building was haunted. When they came back, one intrepid staff member picked up the entry, which was hopping around the room, beating up the other entries.

It belonged to Terry Treadaway (Marshall, AR), who still hasn't decided what he'll spend $200 on. "We just finished doing our Navajo celebration dance, and we're fighting over what to get." Treadaway was last reported to be eyeing New York City to see if it's on sale, but he'll probably settle for Hayden's *Sargon III*, Micro Fun's *Dino Eggs*, some Strategic Simulations games, and a Sweet Micro Systems Mockingboard, which he'll pick up at Computers Etc. in Little Rock.

Paul Lennon and John McCartney. Almost everyone was able to figure out whose phone numbers were listed in the first part. However, 532-5464 caused a problem. It was amazing how many people figured out that the number spelled (*Zork* coauthor) Lebling but tacked on the first names of Marc and Mark instead of Dave. Neither Marc Lebling nor Dave Blank could be reached for comment. The only person who could be reached was Steve Wozniak, who had this to say about people who often get his and Steve Jobs's first names mixed up: "I never really noticed it before, but now it's got me steamed."

The real confusion began when contestants moved on to part two. Some took the liberty of changing T.G. Products founder Ted Gillam's last name to fit their answers: 445-5426 (Gilliam), 445-5267 (Gillams), and 445-5486 (Gillium). Of course, the correct answer was none of these.

There was the anonymous phone caller, who called *Softalk* one March afternoon. Here's what happened:

"Hello?"

"Uh, yeah . . . um, am I on the air?"

"This is a magazine, not a radio station."

"Oh. Oh yeah, right. Um, I had a question about the contest."

"Okay."

"What's so hard about part one? Can't I just call up those numbers and see who answers?"

"You could."

"So what's so hard about it?"

"What area code are you going to use?"

Pause

"Oh."

"Uh-huh."

"Bye."

"Bye."

Intelligently, the caller remained anonymous.

More people put a big fat zero in answer to number ten on part two, which asked for the number to call the operator. Cute. Really cute. In fact, the contest staff just couldn't resist all that cuteness going on at once, so they decided to allow it as a correct answer, in addition to 846-3267 (Timecor), the actual answer.

Yes, Virginia, there is a Synoptic Software. Yes, it is a real company. No, it wasn't a trick. Doesn't anyone remember a program called *Ana-List*? It was reviewed in November 1983. It appeared in the *Softalk* reviews index in February 1984—the issue the contest appeared in—on page 215. Shame on everybody who wrote and said that there's no such thing as Synoptic.

Contest InvisiPrize of the Month goes to Dawne E. Holtz (Izmir, Turkey), whose perfect contest entry was created under less than perfect circumstances. "Phones are a rarity here in Turkey. But if I win, I'd like dinner with Bert Kersey at a restaurant of my choice in my city of residence."

Dear Contestmeister. And now, the contestmeister answers some letters.

To Jim Taylor (Orem, UT): Don't worry, we accepted your entry, even though it was a day late. But please tell your wife that the next time she has a craving for Kentucky Fried Chicken she had better resist. Limbs of dead chickens disgust us. If she feels that strongly about eating birds, send her to get some Chicken McNuggets, but only if she can name the parts of a chicken that look like nuggets.

To Marnie Penning and Lisa Hollis (Tallahassee, FL): We're sorry you caught a cold while working on this contest, Marnie. But we're also very flattered that you preferred reading *Softalk* to visiting the Smithsonian, the White House, and the Capitol Building while you were vacationing in Washington. Thank you, Lisa, for warning us about Marnie, the fat moose, and the elephant. (Readers can interpret the last sentence as they wish.)

To Donna Harris (Tulsa, OK): Sorry you didn't win. Tell your husband that you did, and let him pick out a prize. Let him pay for it, too.

To Bunny Hottenstein (Hershey, PA): No, even though you live in Chocolatetown, and even though it was so close to Easter, it wouldn't have helped you win if you'd changed your name to *Hop*penstein.

The Real Phonies. Here are the answers to the first part of the Phonies contest.

796-3849, Synetix
274-8474, (Lord) British
532-5464, (Dave) Lebling
736-4846, Penguin (Software)
747-8324, Sir-tech (Software)
728-5539, (John) Sculley
746-3649, Phoenix (Software)
468-7638, Gourmet (Software)
463-6266, Infocom
227-7439, (Jack) Cassidy
278-9425, (Bruce) Artwick

Here are the answers to the second part.

Bill Budge: 746-2255 (pinball) or 283-4326 (BudgeCo)

Einstein: 266-7453 (compile, *Einstein Compiler*), 466-3769 (Goodrow, coauthor of *Einstein Compiler*), or 872-4637 (trainer, *Einstein Memory Trainer*).

T.G. Products: 723-3537 (paddles)

Synoptic Software: 262-5478 (*Ana-List*)

Software Publishing Corporation: 737-3453 (*PFS: File*)

Data Transforms: 366-8719 (*Fontrix*)

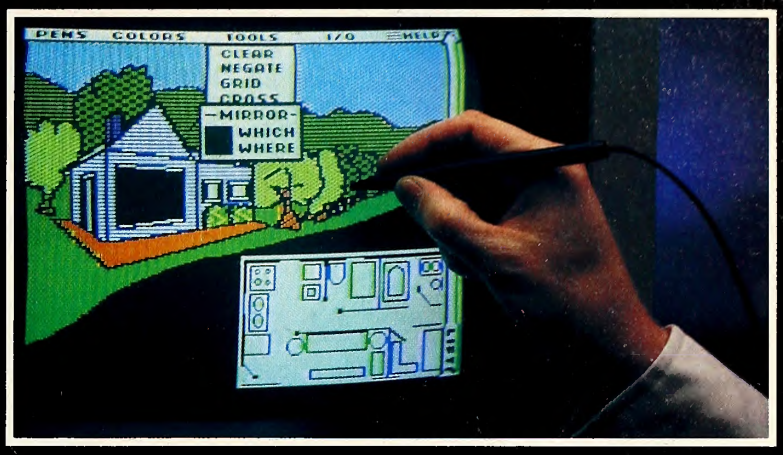
John Besnard: 736-7283 (*Pensate*)

Bert Kersey: 367-2677 (*DOS Boss*), 884-5489 (utility), 847-3475 (*Tip Disk*)

Michael Berlyn: 463-4335 (*Infidel*), 668-6767 (*Oo-Topos*)

Operator: 846-3267 (Timecor, which manufactures the Operator modem), 0 (operator) ◨

Now...Draw On Your Imagination



Introducing The Gibson Light Pen System.™

The link between mind and machine has arrived. Suddenly you're free...free to translate your every thought into professional quality computer graphics... just by touching your screen.

The Gibson Light Pen System software features *icon* menus that offer easy access to powerful graphics tools such as symbol libraries, geometric shapes, mirror-imaging, magnification and complete color and pattern editing. Even if you're not a graphic artist, you can design, diagram and draw with precision at high-speed, in high-resolution, and in full-color...right on your screen.

COMPLETE WITH FIVE SOFTWARE SYSTEMS TO MAXIMIZE YOUR CREATIVE OPTIONS.
The Gibson Light Pen System comes complete with all you need to draw, paint, design, score music and learn animation.

DRAW FREEHAND WITH PENPAINTER.™
A full range of drawing tools, shapes, patterns and colors to draw or paint virtually anything on your screen.

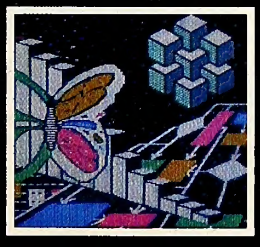
DESIGN PRECISION DIAGRAMS WITH PENDESIGNER.™
Turn your computer into your own graphic design studio. A complete selection of templates make perfect business and architectural diagrams, technical drawings and engineering schematics a snap.

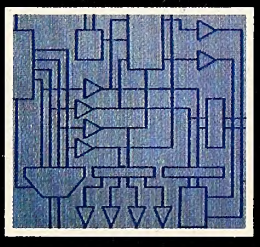
CREATE COMPUTERIZED ANIMATION WITH PENANIMATOR.™
All that you need to learn the basics of animation. Develop your own animation sequences, and bring your screen to life.

COMPOSE MUSIC WITH PENMUSICIAN.™
Score computerized melodies with incredible ease at the touch of your pen.

CREATE YOUR OWN LIGHT PEN APPLICATIONS WITH THE PENTRAK LANGUAGE SYSTEM.™
Take advantage of the software features, and customize your own light pen programs.

NOW AVAILABLE FOR THE APPLE II® SERIES
Coming soon for the IBM PC™ and PCjr.™





Koala Technologies™
800-KOA-BEAR

The Gibson Light Pen System

Touch the Magic of Light

IF YOU'RE LIKE MOST BUY A SINGLE

YOU'LL BUY LOTS OF SPINNAKER GAMES.

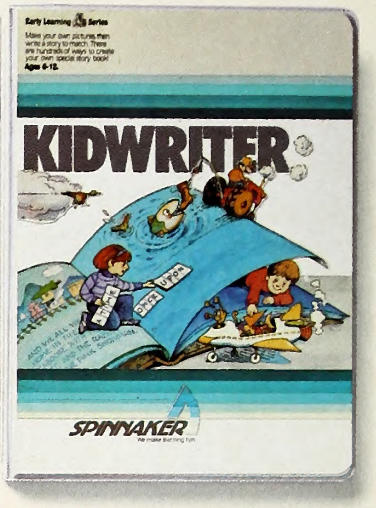
And not just because they're educational, but also because they happen to be a lot of fun to play.

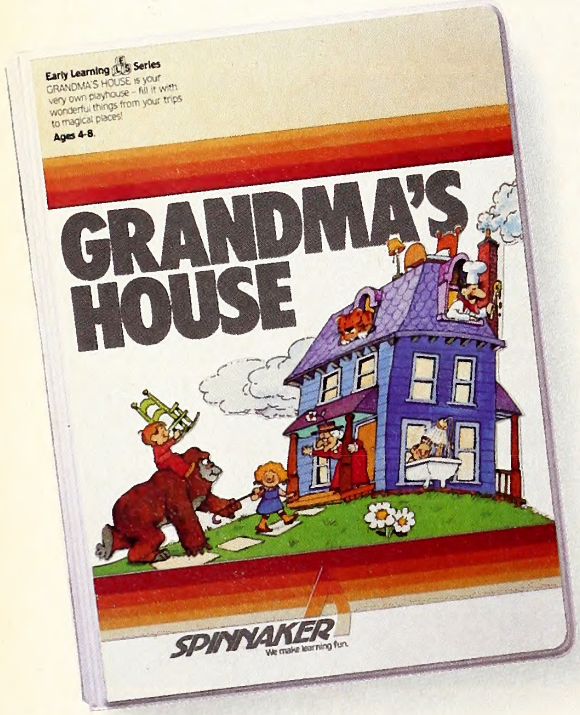
In fact, they're so much fun, parents have been known to sneak in a few hours of play when the kids are asleep.

After all, if your kids are actually enjoying a learning game, there must be something to it. And there is: Fun, excitement and real educational value. That's what sets Spinnaker games apart from all the rest. And what brings parents back for more.

We offer a wide range of learning games for a wide range of age groups: 3 to 14. One look at these two pages will show you how we carefully designed our line of learning games to grow right along with your child.

So if you're looking for a line of learning games that are as much fun to play as they are to buy, consider Spinnaker Games. They're compatible with **Apple, Atari, IBM PC, PCjr, Commodore 64, Coleco Adam** and parents who don't mind their kids having fun while they learn.





It's new! GRANDMA'S HOUSE™ is a magical playhouse. Ages 4 to 8.

GRANDMA'S HOUSE is a very special place for your kids, because they can furnish it with lots of wonderful and unusual things from the magical places they'll visit.

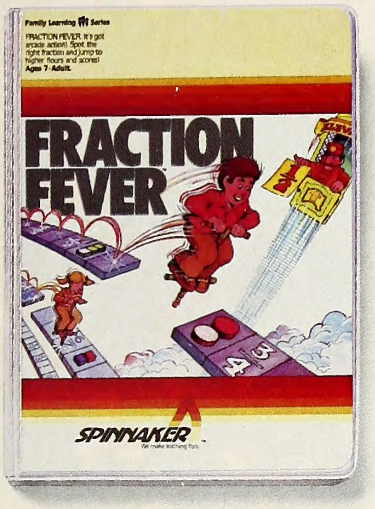
GRANDMA'S HOUSE provides children with an imaginative way to exercise their creativity as they design their own perfect playhouse. You'll love watching your kids have fun with GRANDMA'S HOUSE—you can even join in and play it with them!

It's new! KIDWRITER™ lets kids make their own storybook. Ages 6 to 10.

KIDWRITER gives children a unique new format for creating their own stories. With KIDWRITER, kids make colorful scenes, then add their own story lines. It's as versatile and exciting as your child's imagination!

Best of all, while it encourages children to create word and picture stories, it also introduces them to the fundamentals of word processing. KIDWRITER will bring out the storyteller in your children—and in you!

PARENTS, YOU WON'T SPINNAKER GAME.



FRACTION FEVER™ brings fractions into play.
Ages 7 to Adult.

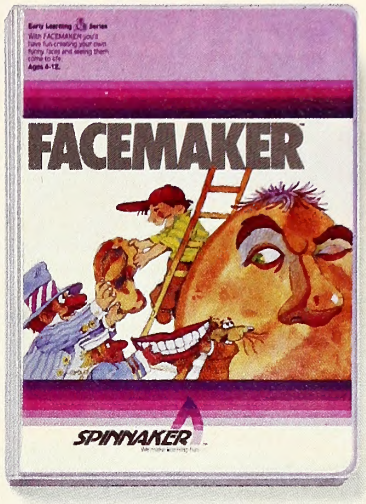
FRACTION FEVER is a fast-paced arcade game that challenges a child's understanding of fractions. As kids race across the screen in search of the assigned fraction, they're actually learning what a fraction is and about relationships between fractions.

All in all, FRACTION FEVER encourages kids to learn as much as they can about fractions—just for the fun of it!

KINDERCOMP.™ Numbers, shapes, letters, words and drawings make fun.
Ages 3 to 8.

KINDERCOMP allows very young children to start learning on the computer. It lets your children match shapes and letters, write their names, draw pictures and fill in missing numbers. KINDERCOMP delights kids with colorful rewards—the screen comes to life when correct answers are given.

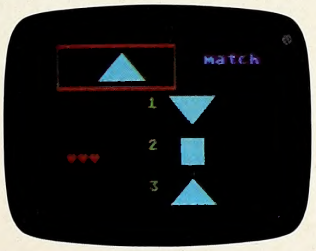
As a parent, you can enjoy the fact that your children are having fun while improving their reading readiness and counting skills.



FACEMAKER™ makes faces fun.
Ages 3 to 8.

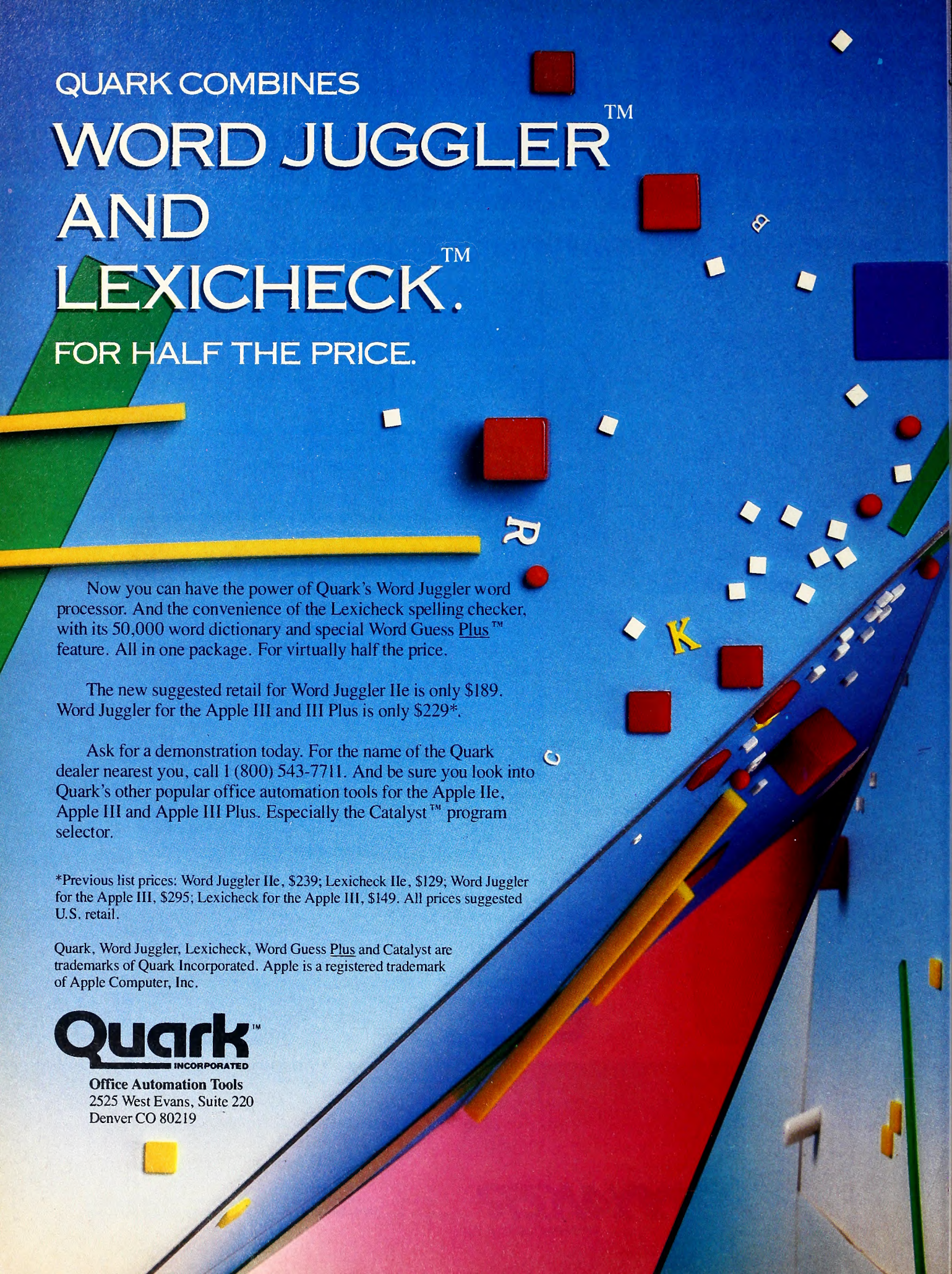
FACEMAKER lets children create their own funny faces on the screen, then make them do all kinds of neat things: wink, smile, wiggle their ears, and more.

Plus, FACEMAKER helps familiarize children with such computer fundamentals as menus, cursors, simple programs, and graphics. FACEMAKER won't make parents frown because their children will have fun making friends with the computer.



SPINNAKER™
We make learning fun.

Disks for: Apple, Atari, IBM PC and PCjr, Commodore 64.
Cartridges for: Atari, IBM PCjr, Commodore 64, Coleco Adam.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OPEN DISCUSSION

Open Discussion gives you the chance to air your views and concerns, to seek answers to questions, to offer solutions or helpful suggestions, and to develop a rapport with other readers. It's what you make it, so share your thoughts, typed or printed, and double-spaced (please), in Softalk*'s Open Discussion, Box 7039, North Hollywood, CA 91605. To ensure the inclusion of as many contributions as possible, letters may be condensed and edited.*

Kan Ya Ketch Quark? Alaska

I would like to express my appreciation to Quark for their conscientious attention to customer service. We purchased *Catalyst* from Quark some time ago for use on our Apple III with a ProFile hard disk. We experienced a few minor problems, mostly due to misinterpretation of the instructions in the manual. Each time I wrote to Quark they called me back almost immediately to respond to my questions. I've worked with many companies and I know what it's like to deal with one that doesn't place great importance on user support. It is no fun to be on the telephone trail for weeks at a time in an attempt to get a problem solved. Happily for us, Quark makes fine products and supports them extremely well.
Michael Youngblood, Ketchikan, AK

More Than Routine

I have obtained much valuable information from reading Open Discussion, and so I would like to pass on to others the favorable experience I've had in dealing with Roger Wagner Publishing (née Southwestern Data Systems). I purchased their *A.C.E.* editor and *Routine Machine*, and I couldn't be more pleased with both purchases. The editor is a marvelous time-saver that eliminates the tedious task of editing, and it incorporates a most convenient renumber utility. *Routine Machine* incorporates more than thirty fast, easy-to-use routines including an incredibly fast sort. As a beginning programmer, I had many questions and the people at Roger Wagner Publishing were most patient with me. One of their people even wrote a separate routine for me to accomplish a specific task. What more could a firm supply in the way of support?
Arthur J. Mier, Grand Rapids, MI

Mountaineering

I have a CPS Multifunction Card by Mountain Computer. It went down shortly after I purchased it. I called Mountain Computer and they tried to help me by phone, but to no avail. So I returned the card to them for repair. Approximately ten days later it was back and ready to go. Wouldn't it be nice if all companies were this cooperative and this prompt when handling our problems?
Joe K. Evans, Roanoke, VA

Apple Sanity Preserves

I'd like to alert Apple II Plus owners to a potential problem with graphics printers and certain graphics software. I'd also like to publicly acknowledge some friendly technical support. As I understand it, certain modifications were made to Apple II Plus systems manufactured in the second half of 1982 under the direction of the FCC. The purpose of the modifications was to reduce radio-frequency interference generated by the systems. An unfortunate consequence of the change—which was corrected in subsequent units, I am told—was the introduction of significant noise on the line to the printer. This causes problems with transmission of graphics data to the printer. I have encountered the problem with a graphics screen dump program, *Printographer*, and with *PFS:File*.

The screen dump program bombed after one line. After spending several hours trying to configure the screen dump program properly, I contacted the software manufacturers, Roger Wagner Publishing. The people there were most willing to help. I sent them several of my trial runs and configurations, but nothing helped. Then, convinced that my printer board was the culprit, I spoke with a technical support person at Microtek, who didn't have an answer either. I contacted my local Epson dealer, who was also unable to help me. Frustrated but undaunted, I reached Epson's technical support group. Within five minutes they recognized the fault and explained how it should be fixed. Following this, I called Microtek again. Armed with the information from Epson, this time I received a solution.

The problem was corrected by a 220-picofarad capacitor soldered across my printer interface card. The screen dump program works like a charm. I want to publicly thank Epson and Microtek for their help in preserving my sanity and reassuring me about my Apple II Plus.
Michael Gornish, Saint Louis, MO

No Surprises, Please

I love *Super-Text* for all word processing. After a year of heavy use, I still keep discovering things it will do. Why couldn't I see right away that its global search and autolink is the only way to file letters? That certain features can bring up a fill-in form for all my letter writing? That the lines are being counted as I write?

Maybe the personal computer industry has fulfilled its obligations with hardware and software manuals and tutorials, but I think the technical explanations have taken precedence over explanations of the tasks the hardware and software can perform. There is almost no literature that will help the user understand just what a computer can do. I think there is a market for articles or booklets describing what can be done with the better word processing and listing programs. Or maybe the advertisement of such articles has escaped my notice.
Raymond A. Petrea, Winston-Salem, NC

Potholes on Money Street

Just how wonderful is *Money Street*? I feel there are several deficiencies in this program. You are limited to fifteen letters for the name of your family or business (this is not appropriate for my needs). An even more serious defect is that, although 100 codes are available, the user is limited to two-digit numbers. Many businesses number their accounts using three- or four-digit numbers, thereby making *Money Street* incompatible with their usual numbering system.

My other complaints concern problems that are less serious because you can work in spite of them. There are more than a dozen reports available, but for some reason, while some are available to either screen or printer (which is good), some are available only to the printer (which is dumb).

A last flaw in this program appears when you enter data. Everything except the check number defaults to the previous entry. So, for example, if a check is written on May 1, 1984, to the XYZ Company for twenty-five dollars, the next check is also dated May 1, 1984, and twenty-five dollars is paid to the order of the XYZ Company until you retype it. Except under unusual circumstances, one does not write consecutive checks to the same payee for the same amount on the same date. So, although the program is fast, its defects should be weighed carefully by the prospective user.
Selbert A. Chernila, Torrance, CA

A Peachy Combination

I would like to mention that I have found what I consider the best program that I have seen since I bought my Apple in 1978. It is a home financial program called *Time Is Money*, by Turning Point Software. It is extensive, complete, and fast.

I also went through five word processors and then discovered the Peachtree combination of *Peachtext*, *Spelling Proofreader*, *Mailing List Manager*, and *PeachCalc*. They are marvelous! There is nothing I can dream up that I would want a word processor to do that this system doesn't.
D. Leppard, Morristown, NJ

General Flight Instructions

Reader Gary Suboter laments that he is not experienced enough to fully enjoy the power of *The General Manager* (February Open Discussion). Rather, I suspect that it may be the poorly written manual that is at fault. I bought the program after reading a favorable review and several positive letters in *Softalk*. The software is excellent, but the documentation is very confusing. It's a shame when a manual is bad enough to discourage users from even trying the program, as I almost was. But if poorly written manuals are bad, inaccurate ones are worse. I've been using SubLogic's *Flight Simulator II* for a month and have compiled an ever-expanding list of features that don't work as documented.

So, to potential buyers of *The General Manager*, be wary of buying it until the manual says what it does; as for *Flight Simulator II*, don't buy it until it does what the manual says.
Franklin Tessler, Los Angeles, CA

Wrong-Minded Hordes

After reading about Apple's Macintosh—the cover story in just about every February computer magazine—I started examining my budget to see where I could squeeze out the $2,495 needed to buy one. Then I read that Apple was selling the Mac to college students for $1,000. Who in their right mind would pay two and a half times as much as someone else for the same item? Has John Sculley failed to learn anything from the Lisa pricing fiasco? For myself, I think I will wait a year. By then, the price of a Macintosh should have been cut in half like the Lisa's—then I'll buy one.
Ralph Orrico, Coraopolis, PA

Big Bad Bang

Softalk has gone astray in its publication of *The Grand Unification of Physics*, which appeared in the March issue. I can't imagine that any significant percentage of *Softalk*'s readership knows (or cares) about the issues being discussed in that article. When I want to bring myself up to date on grand unification theories, I do it by reading *The Physical Review*, *Reviews of Modern Physics*, or any of a number of other journals published by the national and international scientific community. When I want to learn about Modula-2, software or hardware packages, or new products, I look for it in *Softalk*. Please don't squander your limited number of pages by publishing articles that are addressed to the wrong readership.

As for the technical merit of that article, it is a second-party review of an unpublished manu-

Penguin Milestones

April 1981

1st **Complete Graphics System** is shipped.

September 1981

Complete Graphics System makes **Softalk**'s Top Thirty for the first time.

January 1982

lst **Graphics Magician** is shipped. Penguin Software is the first software producer to announce that all its current and future applications software will be available on unprotected, copyable disks.

July 1982

All three software packages then being produced by Penguin Software: **Complete Graphics System, Special Effects** (now part of Complete Graphics System), and **Graphics Magician,** appear in the **Softalk** Top Ten in their category, beginning a many-month stretch in which all three remain there.

April 1983

Graphics Magician is voted the most popular utility of 1982 by the readers of **Softalk**, and the 19th most popular program of all time. **Special Effects** also makes the Top Ten in its category, and **Transylvania** is voted one of the top adventures of 1982. Meanwhile, Penguin announces an experiment in lowering the prices of recreational software. While those original experimental prices have now been increased, Penguin's recreational software is still among the lowest priced.

Fall/Winter 1983

Minit Man, The Coveted Mirror, and **The Quest** all appear in Softalk's Top Five in their monthly categories, with **The Quest** making an appearance as the #1 adventure. **Transylvania** is awarded by **Electronic Games** magazine for graphics and visual effects in a computer game.

Spring 1984

Of the five games released by Penguin Software since April 1983, four are voted by **Softalk** readers into the Top Ten in their categories for 1983. They are **The Coveted Mirror, Pensate, Minit Man,** and **The Quest. Graphics Magician** is once again voted 19th most popular program of all time. **The Coveted Mirror** also is voted by readers into the All-Time Top Thirty. **The Quest** is named the best graphic adventure of 1983 by **Computer Games** magazine. A modernized, all-new version of **Complete Graphics System** is shipped, having been in the works for well over a year. Penguin expands its graphics software to include **Paper Graphics**, a graphics printing tool, and **Transitions**, a presentation tool.

Summer/Fall 1984

Watch Us!

Home Applications. Fantasy Games. Double Hi-res Graphics. Educational Software.
The first games on the Macintosh. . . .

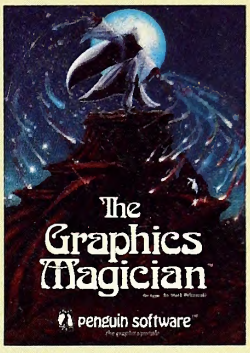
Thank you for making it possible!

We Don't Strive for State-of-the-Art. . . . . .We Define It.

The Complete Graphics System

This brand-new version of our non-programmers' graphics tools includes both best-selling and highly rated products: The Complete Graphics System II and Special Effects, combined into one easy-to-use package. All the command structures have been updated so that selections are made directly by pointing at choices from a graphics screen, or options are described on convenient help screens. This version is so advanced that users will hardly need a manual at all, yet they'll have the most diverse and powerful set of graphic capabilities readily at their fingertips. And we've combined all different versions into one single package that works with joysticks, paddles, trackball, the Apple Graphics Tablet, Apple Mouse, Houston Instruments' HiPad, and the Koala Pad. Priced at $79.95, it's sure to remain the most-used graphics development tool for the Apple.

The Graphics Magician



The new version of The Graphics Magician takes all the abilities of the original version, adds to them, and simplifies their use for even the least technically-oriented programmers. Animation and picture-drawing routines from this best-seller are being used in published products from over two dozen companies, including the likes of Sierra On-Line, Sir-Tech, Milton-Bradley, Mattel, Spinnaker, Adventure International, and many others. The big news is that versions are now being released for Macintosh, Atari, IBM, and Commodore personal computers, with graphics files transferable between computers. That means that a programmer's graphics work on one computer no longer needs to be redone on other computers . . . they can just be transferred with The Graphics Magician. Retail price is $59.95 for the Apple.

Paper Graphics

Paper Graphics is a brand-new graphics screen-to-printer printing utility. As you would expect from Penguin, it's the most advanced and easy-to-use of any such utility available today. An advance, incomplete version has already received an A+ rating from Peelings II, which called it "the most complete of the graphics-dump programs reviewed to date". Besides being compatible with virtually every interface card/black and white printer combination imaginable (we challenge you to find one that it won't work with), Paper Graphics includes magnification, cropping, screen editing, labeling, framing, combination dumps of both graphics screens, and the ability to pack and unpack pictures. At $49.95, you shouldn't settle for less.

Transitions

Transitions is the most advanced graphics presentation system yet on microcomputers. With it, you can easily create self-running or manually operated slide shows or presentations by combining up to eight picture disks (packed or unpacked) and 44 different transitions (screen wipes) between slides. Users can even see a graphic "catalog" of their picture disks, consisting of miniature versions of the pictures on each disk presented on the graphics screen. For a very professional-looking presentation, no other program will do. Transitions retails for $49.95, and together with The Complete Graphics System and Paper Graphics makes the most versatile set of graphics programs anyone could own for their Apple computer.

Additional Typesets and Map Pack

Two add-ons are available for The Complete Graphics System, at $19.95 each. Additional Type Sets contain over 50 extra typefaces that can be used with the text routines in CGS. Map Pack contains over 100 hi-res maps already on packed graphics screens.

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script, which is about as flimsy a contribution as you can get. Guard our pages. Stick to subjects you are competent to pass judgment on, and ones that suit the purposes and desires of your readership.
Dick Smith, Pensacola, FL

Improving the Odds
Oops! We thought we had designed the perfect parimutuel betting system for the Apple. *The Oddsmaker* takes bets, computes odds, payouts, and betting totals, prints tickets, saves and restores multiple betting events, and even takes a house cut. Then *Softalk* pointed out in the March Marketalk Reviews that we hadn't gone the extra step; while payouts were displayed for a one dollar bet, we had left it up to the user to multiply the amount of the winning bet by the payout for a one dollar bet in order to come up with the actual payout.

Well, we went back and corrected the omission. *The Oddsmaker* now features a new screen that instantly calculates the winning payout for any amount bet. Our thanks to the folks at *Softalk* for helping us improve our product.
John Zieg, CZ Software, South Yarmouth, MA

Apple's Teacher Polisher
Looking through the ads in *Softalk* over the past few years, I have noticed an increase in the amount of educational software being released for the Apple. This is a step forward, but the tag "educational" is not always accurate. Friends of mine have Spinnaker's *Fraction Fever*. Not only is the game a graphic disappointment, but the pogo stick is hard to control, making the game frustrating to play. Moreover, the game does not really involve factoring at all, just the mere identification of fractions. Anyone young enough to learn anything from this game would not be adept enough to control it.

I am using *Fraction Fever* as a mere symbol for the useless educational software currently swamping the market. Sure, we can all play arcade games and have fun, but an arcade game for young children should not be dubbed "educational" simply because it is geared for kids. It does not take much to provide an amusing program that teaches the material. I am sixteen; I learned factoring from a Fortran program that gave an algebraic expression in plain symbols and asked me to factor it. It then provided a diagnosis of my mistakes. It was successful because it provided a challenge and acted as a teacher instead of a tester.

My three-and-a-half-year-old brother is learning how to read using a DEC VT-100 terminal hooked up to a mainframe, which, for educational purposes, is less sophisticated than an Apple II. What is the expensive, graphically amazing program that is teaching him the alphabet and how to read? It is a ten-line program that makes the entire alphabet scroll up the screen in big letters. Instead of moving some unidentifiable figure around with a joystick, he is learning how to type! My only fear is that when asked to recite the alphabet, he will say, "Q, W, E, R, T, Y. . . . "

Our educational system, which breeds illiterates by failing to really teach kids before the age of six and by failing to keep the early learners from being bored, must be supplemented. A computer is a great learning tool and the Apple's fine color graphics give it great educational potential. Let's not accept educational games that keep parents busy wading through books of instructions and that turn children off. Let's set children on the right learning path from the start and provide them with truly educational programs.
Jonathan Dubman, Chicago, IL

Erewhon Revisited
Now that we have heard from the experts in the January *Softalk* ("Only A Day Away: Industry Leaders Talk about Tomorrow"), it is time industry leaders heard from users about what they want. Software should be idiotproof and essentially bug-free. A well-designed-and-constructed system should be efficient and easy to build, test, install, use, and maintain.

System documentation must be written so that people without computer experience can understand what to do. System developers are not the best people to write documentation. Have a secretary write it after he or she has struggled with the system. Include detailed start-up, error recovery, and shut-down instructions.

Some of the programs that I would like to have require CP/M or Pascal. Why should it be necessary to buy more equipment to use these products? Systems should be aimed at specific problems, not specific computers. Programs should be written in C or some other language that can be compiled for a variety of computers. Software should be available on disks of all sizes, usable in forty- or eighty-column format, and compatible with a variety of operating systems. These steps will maximize the number of customers. We also need to be able to upgrade to faster speeds and to obtain improved software in ROM without buying a whole new computer.

When advertising a product, please be honest. Tell us exactly what problems the product addresses. Don't hint at things that cannot be accomplished. The warranty should be an honest one, not the legalese we now get. If I buy a software package, I expect it to work as advertised. If it doesn't, the manufacturer has a moral and legal obligation to fix it or refund my money. For a parting shot, how about the computer magazine publishers processing a new subscription in six to eight days and sending an acknowledgment stating the first issue to be delivered?

This letter should not imply that all software is bad, all documentation poor, or all advertising dishonest. But there is room for improvement.
Hubert M. Hill, Kingsport, TN

Presidential Poll: "Utilities" or "Hobby"?
I agree with Bert.
Mark Pelczarski, president, Penguin

Robothink
My favorite *Softalk* was the August 1983 issue ("Robots Come Home"). I think home robots will soon be as popular as home computers are now. How about a section in *Softalk* called "Robotalk?"
Peter "I Love Robots" Prodoehl, Greenfield, WI

Semiglossary
On page 227 of the January *Softalk*, where Peter Olivieri describes the method of creating a glossary file for *Apple Writer II* and the Okidata Microline printers, there is an error on line number 80, which should be corrected to read as follows:

```
80 Print chr$(A);
```

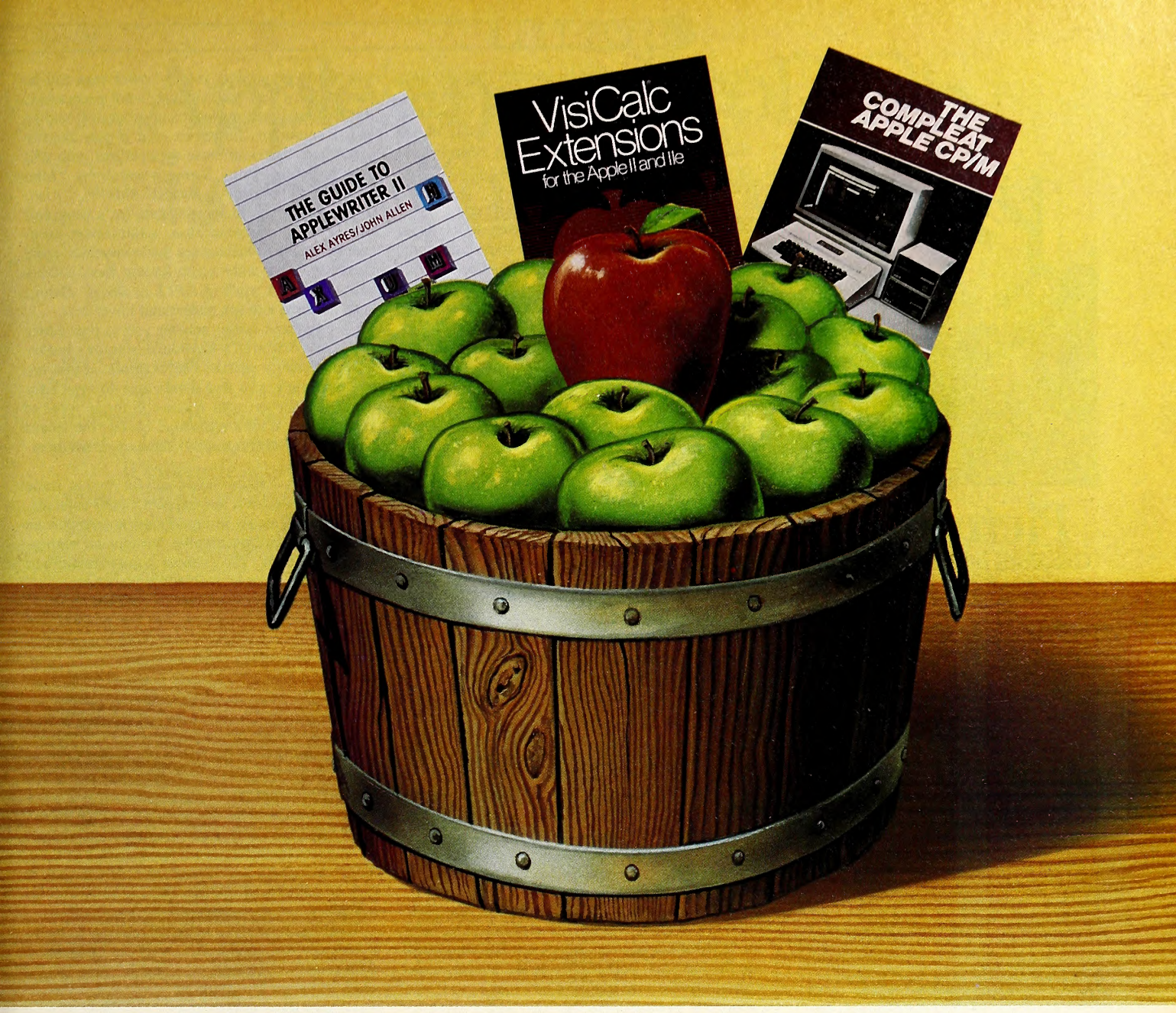
Unless the change is made, the glossary file Special 2 is not in its correct form.

I would like to commend Jerome Levy of Dresher, Pennsylvania, for his method of creating this glossary file for *Apple Writer II* and the Okidata Microline printers. I would also like to advise readers that Okidata can supply an *Apple Writer II* User Tip describing how to embed control codes using the control-V function of *Apple Writer II*. The method that was published in *Softalk*, however, allows for more features of the Okidata Microline printers to be used, and does get around the limitations of the Apple II System and *Apple Writer II* software. Please note also that the superscript and subscript commands on the Okidata Microline printers can cancel each other, which allows you to replace the stop superscript or stop subscript commands with another possible feature of the Okidata Microline series of printers.
Mark A. Tull, applications engineer, Okidata

January's Mind Your Business has come to my rescue. I really thought I was never going to be able to use all the capability of my Okidata 93 with *Apple Writer II*. My sincere thanks to Jerome Levy for sharing the glossary file program and to Peter Olivieri for including it in his column. All I had to do was add a semicolon on the end of line 80 and I was in business. Thanks!
A.W. Bellen, Ridgecrest, CA

A Spoonful of Schuerger
In the February Open Discussion, William C. Vasser asks about the shift key for upper-case letters in *Apple Writer 1.0*. He should get the Dan Paymar Lower Case Adapter, the instruction for the shift-key modification, and the *Apple Writer* patch. He will then get capital letters and readable lower-case letters on the screen.

Dean A. Park wants to convert *Apple Writer II* files into something *Magic Window* could use. I have a great *Apple Writer* utility program called *Apple Writer Extended Features* (Brillig Systems, Burke, VA) that will convert *Apple Writer 1.0*



THE PICK OF THE CROP

If you own an Apple computer, here are three of the freshest, juciest new titles to pick for your library.

THE GUIDE TO APPLEWRITER II, by G. Alex Ayres and John A. Allen, makes this word-processing program as simple to learn as it is easy to use. Using step-by-step examples and 75 illustrations, it explains the editor and shows first-time users how to do everything from entering and editing text to printing letter-perfect documents.

VISICALC™ EXTENSIONS FOR THE APPLE II AND IIe, by Jack Grushcow, is an applications oriented guide that can help you extend and adapt Visicalc™ to your own needs. Because it focuses on customized printing and sorting extensions, data transfer between spreadsheets, and connecting spreadsheets to the outside world, it's a must for the serious Visicalc™ user.

THE COMPLEAT APPLE™ CP/M, by Steven Frankel, is the first comprehensive guide for Apple™ CP/M users. It provides in-depth comparisons between two CP/M 2.2 versions, the Microsoft Soft Card and the Micropro Star Card/Applicard. It also examines the Digital Research ALS card utilizing CP/M, and reviews the performance of over 40 software programs.

Visit your local book store or computer retailer and pick the title that's ripe for you. Or pick a bunch, from Reston.

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files (I don't know about II) into text files and back again. Perhaps that would help. It also does many other useful things, such as permit the embedding of printer control characters into an *Apple Writer* file, multiple copies of letters with different addresses, and simple editing of Applesoft programs.

R. Benjamin wants to know about using lower case. I find the Paymar adapter easy to use from within an Applesoft program, and some handy programming routines are available from either your dealer or from Dan Paymar. The adapter does have a shift lock, and it can also be totally ignored—if I didn't tell you it was there, you wouldn't know. I have not bothered to make the shift-key modification because I'm not sure it would be compatible with some of my utilities and now I'm in the habit of using the escape key. As far as adding RAM: Though it is not readily usable to the average programmer, if you get one of the DOSs that go onto the added board, you will pick up about 10K of available memory.

I have a question about typeahead buffers. Does anybody have one that will work while something is being written to the disk?
Ray Schuerger, Pittsburgh, PA

Arrested Flasher

The March *Softalk* contains a letter from Dale Watson of Cincinnati, Ohio, that describes a program to stop the Apple's cursor from flashing. The assembler code listed, however, was incorrect. In the third line of code:

```
310: 40 91 28 68 3C 21 FD
```

the 3C in location 314 should have been a 4C. The 4C is the 6502's code for a jump. The final three codes translate to Jump $FD21. The 6502 cannot process a 3C; therefore, it issues an error and the program won't run.
David Ingram, Fairfax, VA

Skip the Preliminaries

I hope I can help other Apple IIe and *WordStar* owners avoid one of the blind alleys that I've been in. If *WordStar* starts to show a few odd characters on the monitor, particularly in the overlay messages, and then the cursor won't move at all, the problem probably is in the Apple eighty-column/64K extended memory card.

The chips at fault seem to be the LS245 and the LS374. Cleaning their pins and the card's gold fingers helps somewhat. Removing the jumper J1 also seems to help. The best method, though, is replacing the card before the ninety-day warranty runs out.
Skip Zeller, Corte Madera, CA

Rent-A-Mentor

I read with interest R. Benjamin's various questions about Apples in the February Open Discussion. I would like to add the voice of one who learned his lore by poking around on the keyboard and keeping an open ear when people talked Apple II. I have an Apple II Plus upgraded with a Videx Enhancer II, which supports upper- and lower-case letters, shift-lock, typeahead buffer, and user-defined keys (called macros). My answers are biased in favor of this hardware system.

Lower-case adaptability in an Apple can be had, I am told, by the addition of a Videx lower-case chip onto the motherboard. However, before you go this route, check your Apple. I bought this chip, and was about to try it, when I noticed that it only works on revision seven Apples and above. Mine is a revision six Apple, so I was out of luck and had to go another route. Lower case can be used in most data applications (word processors, textfile-based data management programs, and so on). Remember, however, that if you use the lower-case letters in those applications, you will have to be consistent. Doing a search for "John Smith" will not turn up "JOHN SMITH." Also, if you would like to transfer data (or a program) that is based on lower case, a non-lower-case-adapted Apple II will not see the lower-case letters correctly. And, unless you have a Basic lower-case interpreter (such as *GPLE* or *Beagle Basic*), your machine will not understand lower case.

A typeahead buffer enables you to type faster than the computer's keyboard memory buffer would normally permit. For example, if you are an excellent typist and would like to type fifty words per minute, your Apple will forget some of your letters. With a typeahead buffer, the letters you type will all (eventually) show up on the monitor.

An eighty-column board can be used in some selected applications that support eighty columns. For example, *Apple Writer II* does not support an eighty-column data display without an eighty-column preboot. The preboot comes on another disk, which comes with an additional charge.

Numeric keypads are fine if you use them. If you are familiar with the ten-key numeric pad of a calculator, a numeric keypad is an advantage when it comes to speed. I think a typewriter is a typewriter, and a numeric keypad is a costly nuisance. You should adapt to the instrument at hand. Do you feel the need to use a keypad when you type the date on a letter, or do you teach yourself where the numbers are on the typewriter keyboard? As for other options, a shift lock is very useful when entering program information, or when you don't want to constantly use the shift key to type upper-case letters and lower-case numbers. Finally, concerning user-defined keys, how much will you use them? A lot? Some? Never? A utility program such as *GPLE* supports user-defined keys with no additional cost for hardware.

This has been quite a lengthy answer to some short questions—but I write with the view that I wish someone had told me a few of these things when I first got my Apple II!
Steve Matlock, Cypress, CA

Pascal Pal

This is in response to Ed Lusky's plea for help. Try to get a version of Pascal similar to that used in the computer courses you are taking. If you can't, then try Apple Pascal, which is based on UCSD Pascal, a popular version (at least, I like it). The Apple IIe's 64K can accommodate Pascal; as of this writing, the Apple Pascal system can't make use of any additional memory if you had it. (I've heard that Apple is going to release a new version that can make use of extra memory, but I don't know when.)

Two disk drives are quite sufficient for most applications, but if you have extra money that you just don't know what to do with, then I suggest you buy Apple's eighty-column card. There are two versions of the card, one of which gives you 64K of additional memory. You might want to buy that one; if Apple releases a new version of Pascal soon, you'll thank yourself.
Paul Lucas, Levittown, NY

Public Libraries

This is in response to Paul Raymer's letter in the February Open Discussion bemoaning the lack of inexpensive CP/M software in Apple 5 1/4-inch

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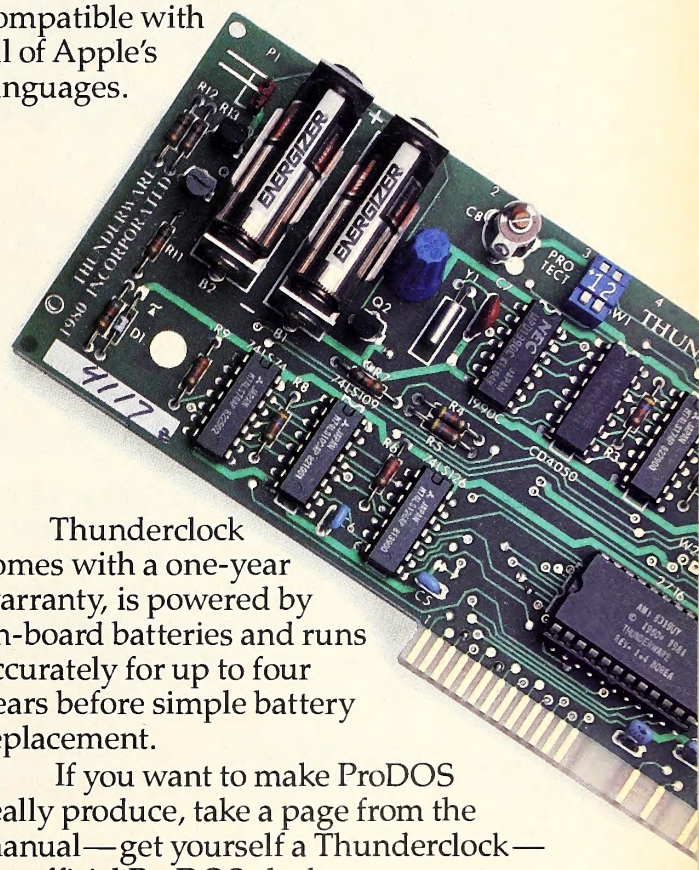

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format. Public domain software is readily available. Many of the programs in the CPMUG and SIG/M libraries work under Apple CP/M with absolutely no modification. Many others need only minor reconfiguration (terminal configuration, mostly). Since most of the programs are supplied as source code and are well documented, it is fairly easy to configure them to work on the Apple. In fact, in several cases Apple configuration is provided by conditional assembly statements that are already in the code.

According to literature I obtained from CPMUG in April 1983, the CPMUG library of ninety-two volumes is available from the New York Area Computer Club for ten dollars per volume on 8-inch disks or for eighteen dollars per volume on Apple 5 1/4-inch disks.

The SIG/M library of 152 volumes is even less expensive. It costs five dollars per volume, plus one dollar per order, for 8-inch format from SIG/M-Amateur Computer Group of Scotch Plains, New Jersey. Many clubs and groups make this library available in Apple 5 1/4-inch format. One such club is Apple T.R.E.E. in Huntington, West Virginia.

Finally, I was surprised at Raymer's statement concerning the need for an update to make CP/M work on his IIe. I moved a Microsoft card from an Apple II Plus to an Apple IIe and had absolutely no problems.
Gary Anderson, Huntington, WV

Faster Out of the Huddle
I would like to respond to Lynn Leopard (March Open Discussion). I had the same problem with the new version of Strategic Simulations's *Computer Quarterback* being slower than the original version. I called the company and they said all the older versions were thrown out. I was stuck with playing the game in slow motion—until I received my new Titan Technologies Accelerator II in the mail. Boy, was it amazing! The speed increase was incredible, and it worked with more than games. It sped up all my favorite programs, including *VisiCalc*, *Apple Writer II*, and *DB Master*. No more waiting for me; my hat is off to the people of Titan Technologies of Ann Arbor, Michigan.
Brian T. Knight, Tecumseh, MI

Santa's Star-Gazers
I am a school speech/language pathologist and, in addition, have just begun teaching computer classes at a rural elementary school. The school system is out of money after buying the hardware, and I have stretched my pocketbook to the limit. My first question is, if you are allowed to make backup copies for your personal use, does this include a school system purchasing a package and then copying enough for all of the schools in the system? Can a single school purchase a package and then make copies for all of the computers within that school?

Second, I looked forward for months to buying a *Telstar One* by IUS to accompany my daughter's Christmas telescope. The reviews made it sound like an excellent program. However, when I tried to order this program I was told that it was discontinued by IUS because of a disagreement with the author! Does anyone know where an old copy can be obtained or when it will again be in production?
Jill B. Harman, Manchester, GA

III Cheers
I am trying to locate an eight-inch floppy disk drive for use on an Apple III. Perhaps a reader has a suggestion. I need disks that are double-sided

and double-density. I need all necessary components available without having to do my own design work, including the disk drive, controller board, power supply, cabinet, and SOS driver. I would be willing to assemble a kit or separate components. It would be especially nice if I had the ability to read (via a SOS driver) single-sided, single-density disks (IBM 3740 format), and if the whole package cost under $1,000 (the further under the better).

I believe that the Apple III is an excellent machine. It's too bad that Apple bungled its introduction and promotion. For a general user, its strongest point appears to be its weakest link—device independence through SOS drivers. Many people appear to find the installation of these intimidating. Being an avid Apple III and Pascal fan, I find the articles by John Jeppson and Jim Merritt to be particularly fascinating. Jeppson is above my technical level, providing me with much to learn. Merritt writes more for my level and his articles are readily understandable. I compliment him on his clarity of explanation and good analogies and examples.
Milton L. Johnson, Milwaukie, OR

Business and Recreational Basic
Our organization currently has ten 256K Apple IIIs in use. The users range in experience from a few who have had Fortran and Cobol training to rank novices (like me).

My responsibilities lie in the field of parks/recreational-areas planning. I have a real interest in *Business Graphics* and its potential application to mapping, advertising, and internal presentations. I thought I was getting a handle on it until I started reading your column. You made me aware that I was just scratching the surface. *Business Basic* is, at least for now, the operative language in our offices. Can any readers suggest any books on Apple III Basic? Keeping in mind the range of experience of our users, and the lack of elaboration in the manuals, such a text would be worth its weight in gold around here.
Dill Ringham, Cochrane, Ontario, Canada

You may want to contact the Business Apple Group, located at 1850 Union Street, Suite 494, San Francisco, CA 94123.

Oh, Good Graph
I compiled the *BasicGraph* program that appeared in the December 1983 Basic Solution column. For compiling, I used the Hayden *Compiler Plus*. After compiling, the pie chart shown in the column took nine seconds to be drawn. Incidentally, I did have to make some modifications to the program before it compiled. For some reason I kept getting the out-of-data error when I ran the compiled version. I finally solved it by manually assigning C$; that is, C$(0)="0000", C$(1)="2202", and so on. Quite a nice program. Thanks.
David T. Harvey, Jr., Arlington, VA

A Natural Response to Peeking
In response to Mike Zulauf's letter (March Open Discussion), the area around hex location C030 is a soft switch that controls the speaker. Listing $C030 in machine language or peeking at location −16336 in Basic instructs the computer that the speaker is being addressed, which clicks in response. Regarding the read at location $C080, the computer will hang unless the Apple has been booted with a System Master disk and Integer Basic, because it's another soft switch that requires Integer Basic to work. For a better explanation, please see the If/Then/Maybe column in the February *Softalk*.

I also want to comment on how great it has been getting *Softalk* the last couple of months. I find the articles very insightful, especially the guide to assembly language, and I always read the software reviews. I use Apples at school but don't currently own one; reading *Softalk* has made me more determined to get one. Thanks, and keep up the good work.
Peter Neubert, Appleton, WI

King-Size Sheets
We have an Apple IIe with 128K. Our software is *Multiplan* by Microsoft. We evidently build larger spreadsheets than normal because we are running out of storage capacity. We feel that we need from 200K to 300K—and all of this on one disk. Can a reader help us with the best way to accomplish this?
David L. Parks, Decatur, AL

A Farthing for Your Thoughts
I have an Apple IIe computer with an Epson MX-80 III F/T printer, and I use the *Apple Writer II* word processor. I have a need for the British pound symbol in much of the word processing work I do. I would like to embed the program to print the pound symbol in the *Apple Writer* glossary so that I can use it easily when I want to. I would appreciate it if a reader could tell me how to do so. Can I program one of the keys to print the pound symbol? I know nothing about programming, so I will need to know the complete step-by-step process.
Kendall C. Sanford, Baie d'Urfe, Quebec, Canada

Adavocate
I think that Ada is a strong language and I would like to use it. Can someone tell me if it is available for my Apple IIe (64K with an eighty-column card) and where I can get it? Also, what operating system does it run under?
Mike McCormick, Pittsburgh, PA

Super Text, Poor Spelling
I have been searching for a long time for a spelling checker that will work with *Supertext* and have found nothing that even comes close. Can anyone help me?
Jack Woychowski, Toms River, NJ

Mourning After
Has anyone written a program for computing the Yahrzeit (a Yiddish term for the anniversary of death, pronounced Yorksite)? I would like to purchase a program for this if available.
Harry Northrop, Waterville, NY

Omnisoft, The Artful Dodger
The elusive Omnisoft Corporation and its Starfire Games division—formerly operating a one-sided mail order business out of a Chatsworth, California, condominium—has relocated. According to the office of the Regional Chief Postal Inspector for the western region in San Bruno, California, Omnisoft has moved to Wichita Falls, Texas. We are as yet unable to locate an address or phone number for the company in Wichita Falls. Starfire complaints should be addressed to the Regional Chief Postal Inspector, 1407 Union, Memphis, Tennessee 18161. Attention: Fraud. ■

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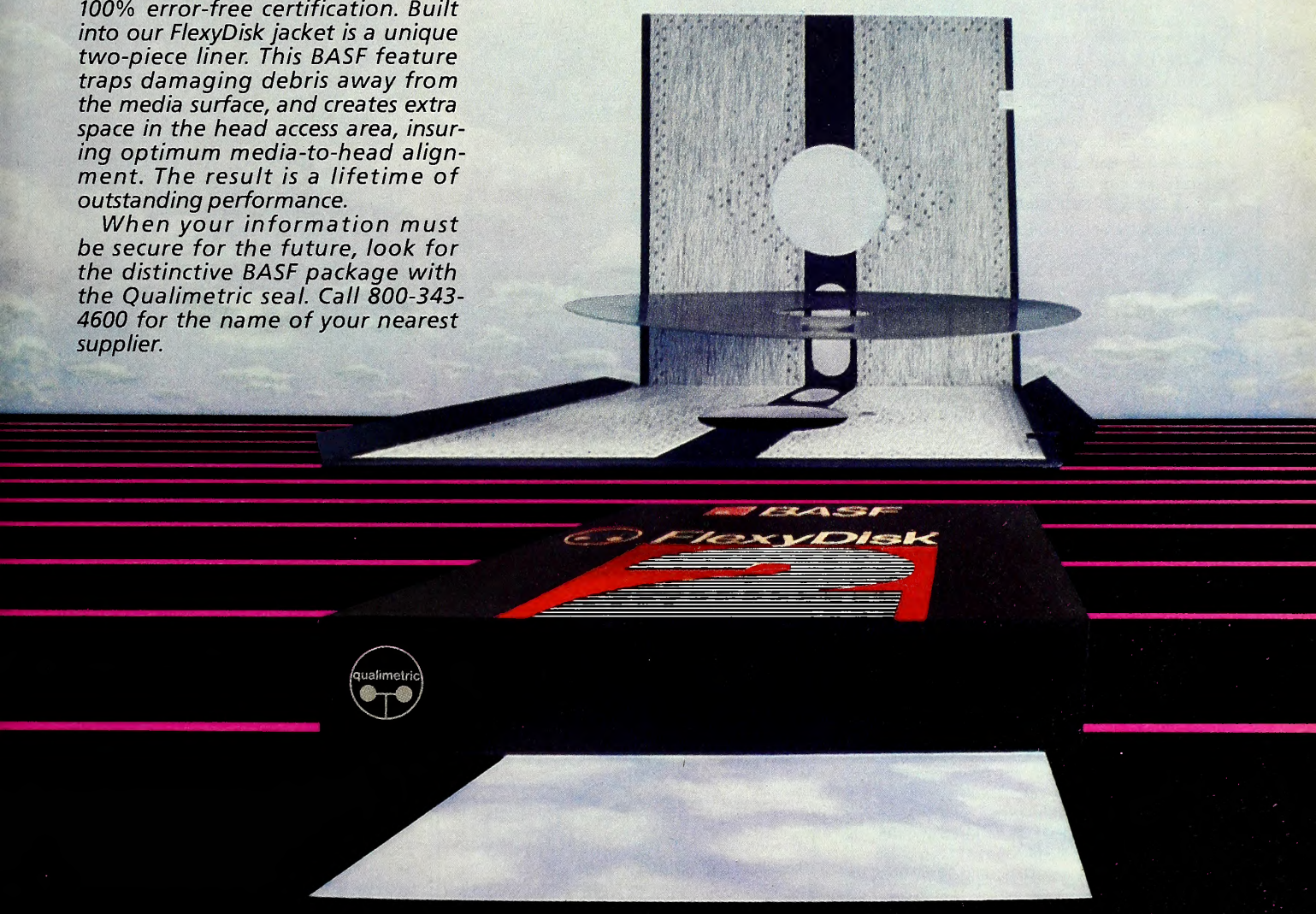

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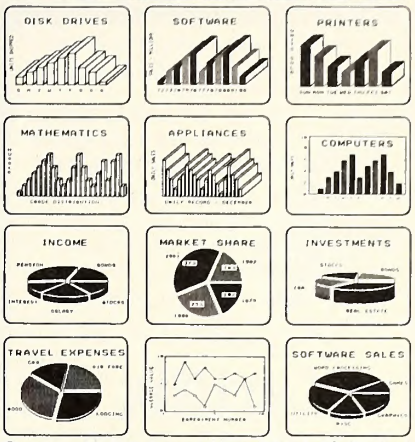

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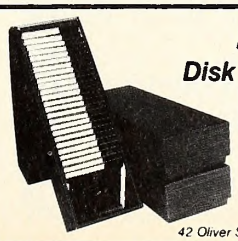

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This is the best menu generator money can buy. Make custom menus for all your DOS 3.3 disks in seconds. E-Z MENU MAKER will generate sorted menus from the disk catalog automatically. Upon booting, the menu will run, brun, or exec any program with the touch of a key. Program with instruction booklet is only $14.95. NM res add 5 % tax. Send check or M/O to: TIPS, Box 312-A, Hobbs, NM 88240.

CAULDRON LINE EDITOR

*Edit Applesoft programs fast
*User-modifiable keyboard macros
*Global search and replace
*Supports Apple II+, IIe, IIe 80-col.

Send $19.95 to Cauldron, Box 8227, S.M., KS 66208 (Kansas residents add $.91 sales tax).

FREE PASCAL CATALOG

Catalog of LOW cost ($5-$20) utilities. All with SOURCE text. Includes print, file, input, sort, & others. Kingdom Computer Concepts, Box 182, St. Johnsbury Ctr., VT 05863.

Word Processing

APPLE WRITER GLOSSARY DISK

Contains glossary files for Epson MX/FX, Gemini 10/10X, Apple DMP/Imagewriter, NEC, Prowriter, and Okidata. Access any print command in *Apple Writer II+* or *IIe* with a single keystroke. Underlining and superscripts on Epson MX and Gemini, also Sub/Superscripts on Apple DMP $14.95 + $1 S/H. MinuteWare, Box 2392, Columbia, MD 21045.

EPSON FX-80 GLOSSARY FOR APPLE WRITER IIe

Confused about getting all the FX-80 print options to work when using *Apple Writer IIe*? Our EPSON GLOSSARY makes it easy! Just load the file and use a 1-character command. Quality disk comes with a glossary, sample *AWII* files, manual, and free *AWIIe* "Cheat Sheet." $14.95 + $1 shipping. (NYS sales add sales tax). **AEROCAL, Box 799, Huntington, NY 11743.**

PROWRITER FONT GLOSSARY FOR APPLE WRITER II/IIe

Control all the functions of your Prowriter, including: double width, boldface, underline, pica, elite, proportional compressed, superscript, subscript. Use in any combination, easily. $9.95—comes on disk, with complete instructions. Nerdworks, 195 23rd NE, Salem, OR 97301; (503) 585-1373.

Communications

The Stating of the Art: A User-Friendly Document

Manufacturers producing floppies and friendly documentation for usering often access confusing on the way to ease of use.

At the West Coast Computer Faire last March, a man stopped at one of the booths and asked about the word processor on display. Here's what he was told.

"One of the most powerful features of *MondoWriter* is that it allows the user to move blocks of text around the document at the touch of a key. Of course, we at MondoSoft realize that everyone is different, so that's why we made each command key customizable by the user. Now, it may take a little getting used to, but I assure you that *MondoWriter* is state-of-the-art word processing, offers ease of use, and is extremely user-friendly."

The man, who happened to be a human being and wished to remain one, walked away. He didn't walk away because he was insulted or intimidated. He walked away because the product was obviously not for him. It was for something called a user. Whatever a user was, certainly he was not one. The word sounded like it meant "something that uses."

Last winter, the man's daughter was used by some cradle robber at her high school. On public television the night before, there was a special about cocaine users. And that day, the man could have used his car to get to the Faire, but he drove it instead; otherwise, it might have turned into a used car when he arrived. Nope, he wasn't a user.

User isn't an insulting term, just an awkward one. Computer enthusiasts don't often call themselves users, but they don't mind being referred to as such. Computer clubs have names like Mid Valley Apple Users Group, but you don't hear people in singles bars say, "No kidding, you're a user? Wow, I'm a user, too! Karma." They'll usually say something just as bad: "I'm into computers," which ranks up there with "I'm *into* aerobics." (If a person who uses computers is a user, does that mean a person who does aerobics is a doer? Ugh.)

It's understandable for computer hobbyists to call themselves users. But what is it that makes writers of software manuals fall in love with the word? There must be some inherent satisfaction in writing sentences like, "The function keys are user-definable," instead of "You can change the function keys."

On top of all this are the hardware and software producers who refer to their customers as end users. They never do say who the front, beginning, or middle users are. But that's okay, just as long as their products are end user–definable or end user–friendly. Which brings us back to our man at the Faire.

MondoSoft wasn't satisfied with having a product that was easy to use; its software developers added a feature to boast the fact—ease of use. The man visiting the booth assumed this meant the program wasn't hard to use. The toaster he bought the other day wasn't hard to use either, but it didn't have ease of use. A smart shopper would have noticed that immediately and looked for a toaster that had it. It was hard for the man to believe that some software had ease of use, while nothing else had difficulty of use. "Ease of use," he mumbled to himself. If a product didn't feature those three words, it wasn't worth buying.

At the next booth the man met a slick-looking salesman with a forty-dollar haircut, nice shoes, and a suit that was cut too big.

"If you have any questions," the salesman said, "just take a look at our user-friendly documentation." There was that word again.

Now the man was confused. All the software he had at home came with manuals. Here was one that actually had documentation. He wasn't sure what the difference was, but documentation sounded a lot more impressive than manual. "Doc-yoo-men-tay-shun," he thought. "Man-yoo-al." Hmm. Five syllables versus three. Better check this one out. Here's what he heard:

"One of the most powerful features of *DocuWriter* is that it allows the user to move blocks of text around the document at the touch of a key. Of course, we at DocuSoft realize that everyone is different, so that's why we made each command key customizable by the user. Now, it may take a little getting used to, but I assure you that *DocuWriter* is state-of-the-art word processing, offers ease of use, and is extremely user-friendly."

The man walked away from this booth, too. *DocuWriter* obviously wasn't for him. Based on what the salesman said, it was probably for lawyers, politicians, and government workers, whose everyday work involves documents. It probably wasn't for people who write letters, school papers, business reports, and office memorandums. Or was it?

Was there something magical about this word processor that could turn a letter into a document? He thought about it for a while.

"Whatcha doing, honey?"

"Oh, just writing a document to mom. She says she just loves receiving documents from me."

"How nice. That reminds me, did you see the nice thank-you document we received from the Gilmours? They said the blender we gave them for their wedding had great ease of use."

Maybe he didn't need such a program. On the other hand, if it did create documents, he wouldn't need a lawyer anymore; he could just boot up the program, and presto: documents.

If nothing else, at least it was end user–friendly. He surmised that the term meant "friendly to the user." What if a nonuser came along and tried to run the program? That would be a sight; friendly to one person, hostile and belligerent to the next. None of this mattered, though. He wasn't a user. If he were, he'd still be back at the MondoSoft booth.

Across the aisle was a tiny booth that didn't seem to be displaying any software, but little

wooden boxes instead. This looked like a safe booth to visit.

"Hi, we're Disk Philes, and we manufacture storage boxes for your floppies. Each box accommodates up to thirty floppies and can be expanded to hold increments of fifteen floppies."

So much for safe. Whatever a floppy was, he didn't have any. He had floppy disks, but nothing called floppies. Only later did he realize the woman at the booth meant floppy disk when she said floppy. He didn't need such a box, but it did remind him to pick up some legals and scratches from the stationery store on his way home. May as well get some fountains, felts, and ballpoints that write in erasable, too.

The man avoided entirely the Word-for-Word booth, which was exhibiting diskettes. He didn't need any diskettes, because he didn't have a diskette drivette. Diskettes, he figured, must have gotten their name because they're smaller than industrial-sized eight-inch disks. So what does that make the 3 1/2-inch ones that go with Apple's Macintosh? Diskettettes?

It was time to go. On the way out, the man was stopped by someone handing out pamphlets describing a "new state-of-the-art product." Thank goodness for that. If there's anything the computer world doesn't need, it's old state-of-the-art products. Maybe that should be former state of the art or state of the old art. Most of the exhibitors at the Faire said their products were state of the art. If that were true, every product would've been as good as every other one. And that obviously wasn't true.

According to the person handing out the pamphlets, the product was a "state-of-the-art business package" that offered spreadsheet, database, and word processing capabilities in one program, on a single disk.

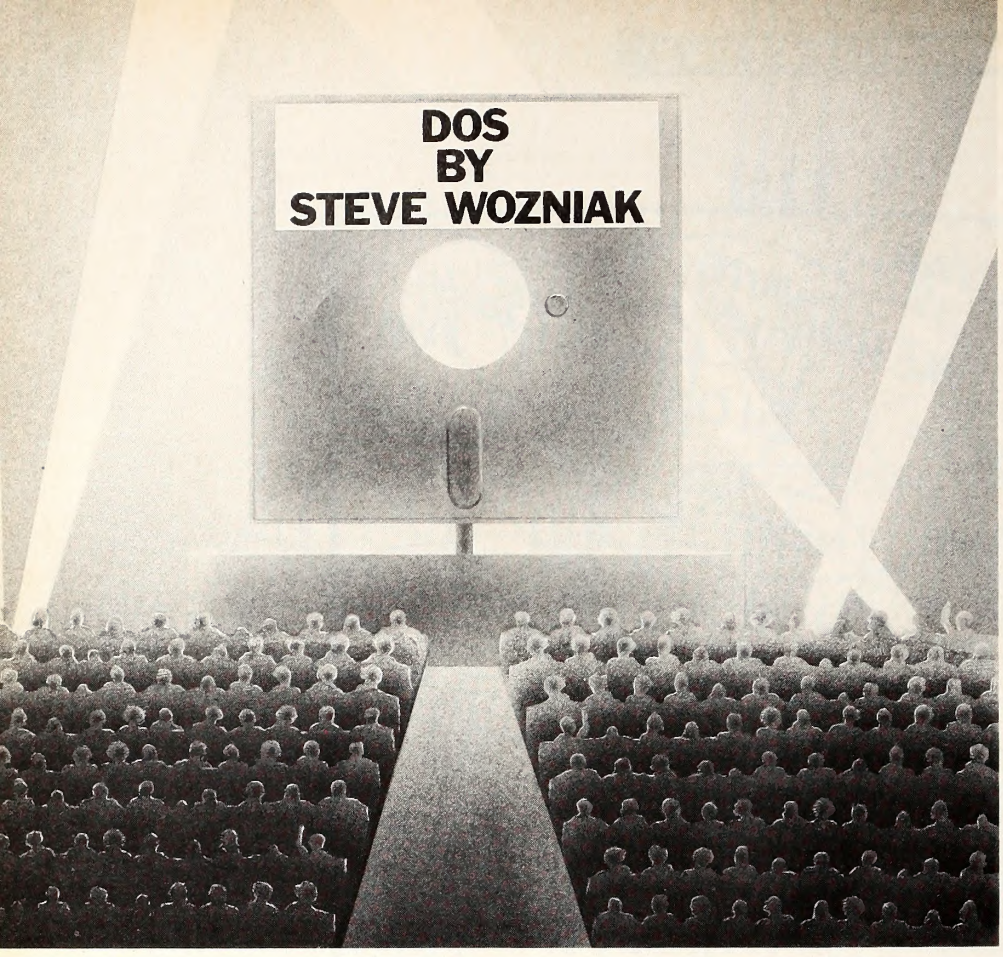
The state of the artfulness of the program was that "all programs reside in memory at once, reducing the necessity of having to access the disk."

"Is this true?" he asked the woman with the pamphlets.

"Yes; the program accesses the disk only for data retrieval. It never needs to access the program disk."

As the man walked out the door (or accessed the exit), he thought to himself, "Access the disk." Was that like combinationing a lock, oven mittening a pot, and drivewaying the garage? It gave him something to think about as he freewayed, avenued, and streeted home.

He forgot to stop at the cleaners to pick up his monogrammeds. ***—Matthew Yuen***



Systems

DOS: Apple's Unsung Champion

It's popular to knock DOS, but Woz's elegant, powerful workhorse keeps surprising us.

Wilt Chamberlain sounded a plaintive note last month when Kareem Abdul-Jabbar broke his all-time NBA scoring record. He pointed out that nobody made any hoopla over his record while he was setting it and that it was only one of dozens that he holds.

Chamberlain also bewailed the general consensus that Bill Russell was a better player than he, asserting that if rebounding records had been kept during his career, he'd lead in that category and he might even lead in blocked shots.

It was kind of bemusing to watch Chamberlain make a valiant attempt to be a good sport about his record being broken. But even with that record gone, nobody thinks Chamberlain is the Rodney Dangerfield of professional basketball.

There are lots of parallels to Chamberlain's situation of being relatively unappreciated. Beatrice spent millions of dollars on advertising during the Winter Olympics to raise the consciousness of the populace to the parent company of such famous brand names as Samsonite.

The Apple II computer has its own valuable but reasonably unappreciated player. It's the disk operating system, known as DOS. For those of you new to computing, that sounds like floss and not like gross. What DOS does is instruct the computer how to store and retrieve files from the disk. Lots of folks like to put the knock on DOS. It's too slow, it's too limited, it can't do sophisticated tasks.

Apple itself seems to have sided to some degree with the critics by bringing out ProDOS, which is theoretically a stronger, more versatile operating system that will aid business application developers. In addition, it will recognize Apple III data files.

But for those of us who have come to know and love DOS, all this criticism is just so much misplaced bushwa. The number of programs that got their start under DOS is too long to include, but start with *VisiCalc*, *DB Master*, *Home Accountant*, *MasterType*, *Ultima III*, *Choplifter*, and *Sargon*. That's an incredible range of product, both in complexity of effort and in diversity of application, that all function under DOS.

DOS was the brainchild of Steve Wozniak. It's told that Wozniak labored twenty-four straight hours on the project, after which it was essentially what you see today. That's probably apocryphal, but it's too good a story to debunk.

If you think Apple DOS is slow, try a comparable program on the Commodore 64. If you think DOS is unsophisticated, try some of your favorite tricks on an Atari 800. If you think MS-DOS is the bee's knees, ponder the benchmark test published in *Interface Age*, when a typical set of accounting functions took twice as long on the IBM Personal Computer.

Softalk processed its circulation records on Apple II computers for the first thirty months of its existence. When the time came to change over to a minicomputer, the circulation list was 157,000 records strong. It was no fun to handle that many records on the Apple II, but with the help of three hard disks, it was possible.

A look at the print program that generated four-up Cheshire labels for *Softalk*'s monthly mailing gives an indication of the complexity available under the DOS umbrella.

When the print program was run, three auxiliary data files were opened. One read into memory the list of circulation codes that were current. A second file, which was read as the printing progressed, listed all single zip codes in which there were six or more subscribers. A third file, likewise read progressively during the run, listed all multiple zip-code cities in which there were six or more subscribers.

In addition, of course, the program walked across more than three hundred data files that were strung out across three hard disks.

As the program worked, it would look at the code in each record, compare it to the list read into memory, and make a print or no-print determination. If the determination was made to print the record, the codes were analyzed to determine if a legend should be written on the label (many of you first received *Softalk* with a legend stating that your subscription was sponsored by your local retail store or by a software publisher). Then the zip code was compared against both the single zip-code file and the multiple zip-code file to determine if the printed label should be marked as belonging in one or both of those categories.

Once that determination was made, the label was printed to paper and the zip code of the label was incremented by one in a file that was being created as printing took place. The end output consisted of the mailing labels and a DOS text file containing a listing of the number of copies sent to each zip code.

The DOS text file was then converted to an Apple III file, and postal reports were generated using data stored on a ProFile hard disk.

The point of all this is the complexity of the overall effort. An Apple II was capable of printing different data to two different output devices while reading simultaneously from three files and holding a fourth file in memory.

How fast was it? The Apple II had to wait for an Epson 100. When it was linked to a high-speed serial printer (a Printronix six-hundred-line-per-minute printer), it could drive the printer at about one hundred fifty lines per minute.

The print program was the genius of Ken Williams of Sierra On-Line, who threw it off in about twelve hours and spent about four hours subsequently smoothing it out.

That's one of the beauties of DOS; it's easy to understand and easy to implement for those reasonably conversant with its intricacies. And it's certainly versatile enough for most applications.

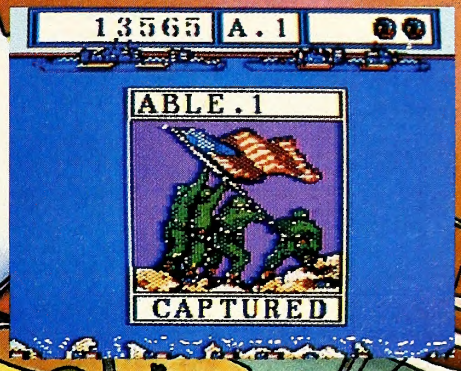
We all appreciate the special genius Wozniak demonstrated in designing the Apple II. Now it's time to pay homage to his efforts in creating DOS. It's a marvelous tool—versatile and uncomplicated.

The line's been stolen so many times that the author has passed into anonymity. But it could just as well have been written about DOS as the other products to which it's been applied.

Simplicity is the ultimate sophistication.

—Al Tommervik

BEACH LANDING!



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BEACH LANDING

Weekly Reader Family Software

A division of Xerox Education Publications
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Tips

A Simple Trick To Improve dBase Formats

How to get cleaner reports when using the well-known CP/M relational database.

dBase II can be a very powerful database management system. The basic structure of the program is simple. To create a database, you enter the name of the field, the number of characters in that field, and the type of field (numeric, character, or logical). If necessary, enter the number of decimal places for each appropriate field.

The report formats are also simple. For each column of data, you enter the width of the column, the field name, and the heading for that particular column.

Because *dBase II* is so simple, it's limited. As a result, the majority of its users resort to programming. By writing programs and integrating them with the original database, users make the program limitless.

Programming can be fun and productive if you're interested in it and have some programming experience. But if you aren't a programmer and aren't inclined to be one, how do you get what you want out of the program and the database?

There are commands in *dBase II* that can work wonders for you. Consider one of the most common problems experienced in *dBase*, that of column headings. A work report from Hot Air Appliance Repair illustrates this.

There are basically four matters of concern here: The column headings are not neat, but sloppy and nonconforming; the column heads are too close together; extra lines have been inserted between some of the column headings and the underlining; and the headings do not appear to be centered above the text.

This report was not the result of a user error. You can get the same results by following the directions in the *dBase II* manual. That is perhaps what makes it so frustrating: You're doing exactly what you should do, but the results are horrendous.

But take heart. There is a solution—without programming.

Log on to *dBase II*, set the default to B if necessary, and enter:

```
CREATE SAMPLE

COL   NAME,TYPE,WIDTH,DECIMAL PLACES

001   DATE:RPT,C,8
002   DATE:SVC,C,8
003   EQUIPMENT,C,15
004   PROBLEM,C,20
005   TECHNICIAN,C,10
006   WORK,C,20
007   FOLLOW:UP,C,15
008   <RETURN>
```

This gives a sample database to illustrate the report commands necessary for generating the beautiful report you want. If you enter the records shown in Hot Air's report, you'll be able to print out a sample report after completing the following exercise.

After adding the records, press control-W simultaneously to save the records and return to the dot prompt. Then type:

```
REPORT FORM FIGURE2 TO PRINT
```

You'll have a chance to change the left margin, the number of lines per page, or the width of the report. For the moment, type:

```
W = 120

PAGE HEADING?(Y/N)              Y
ENTER PAGE HEADING:             FIGURE 2
DOUBLE SPACE REPORT?(Y/N)       N
ARE SUBTOTALS REQUIRED?(Y/N)    N
```

Now you can enter the information required to create the first column. There are three problems with this column in Hot Air's original report: The heading isn't centered, there's an extra line in between the heading and the underlining, and the whole thing's too close to the next column. To correct these problems, we must understand why they occurred.

In fact, the heading *is* centered—but over the whole column rather than just the text. It appears off-center because all the text is flush left. Because it's easier to change the format of the heading than that of the text, we'll trick our eyes into thinking the heading is centered by making it flush left, too. This is accomplished by using the less than (<) when entering the heading.

The reason for the extra line between the heading and the underlining is simple. There are eight characters in the field. There are also eight characters in the word *reported*. Whenever the title uses all the character spaces allowed in its field, the program automatically sends a carriage return to the printer. The situation is easily remedied by lengthening the field.

Lengthening the field solves the third problem by widening the space between the columns. The number of characters you add to the field is up to you. For this example, use two spaces. At the prompt, type:

DATE REPORTED	DATE OF SERVICE	EQUIPMENT	PROBLEM	NAME OF TECHNICIAN	WORK PERFORMED	FOLLOW-UP
1/20/84	1/22/84	DRYER	NOT DRYING	HAMMEL	CLEANED FILTER	NONE
1/20/84	1/23/84	REFRIGERATOR	NOT COOLING	BROWN	PART ORDERED	1/25/84
1/21/84	1/25/84	WASHER	NO HOT WATER	SMITH	UNCLOGGED H/W FILTER	NONE REQUIRED
1/22/84	1/25/84	REFRIGERATOR	NOT COOLING	HAYES	NEEDS NEW REFRIG.	NONE

Figure 1. Hot Air Appliance Repair, Inc.

DATE REPORTED	DATE OF SERVICE	EQUIPMENT	PROBLEM	NAME OF TECHNICIAN	WORK PERFORMED	FOLLOW-UP
1/20/84	1/22/84	DRYER	NOT DRYING	HAMMEL	CLEANED FILTER	NONE
1/20/84	1/23/84	REFRIGERATOR	NOT COOLING	BROWN	PART ORDERED	1/25/84
1/21/84	1/25/84	WASHER	NO HOT WATER	SMITH	UNCLOGGED H/W FILTER	NONE REQUIRED
1/22/84	1/25/84	REFRIGERATOR	NOT COOLING	HAYES	NEEDS NEW REFRIG.	NONE

Figure 2. Cool Breeze Appliance Repair, Inc.

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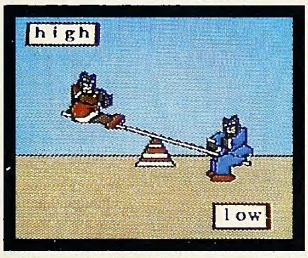
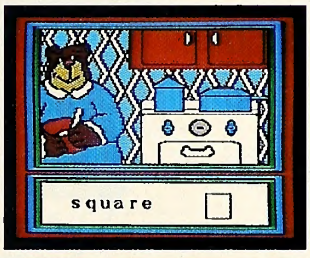
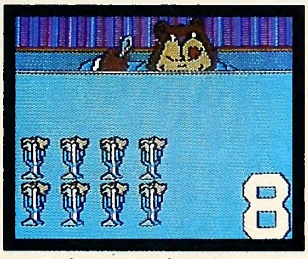


NEW Stickybear Shapes



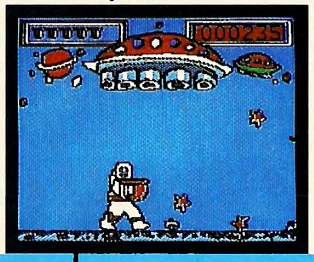
Stickybear ABC



Stickybear Numbers

Games for the family

NEW Stickybear Basketbounce



Stickybear Bop

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Name (Print) _____
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City _____ State _____ Zip _____

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```
COL    WIDTH,FIELD
001
```

and enter:

```
10,DATE:RPT <RETURN>
```

For the heading, enter:

```
<DATE;REPORTED;- - - - - - - -
<RETURN>
```

The system automatically breaks between the words *date* and *reported*, because it recognizes that both words won't fit on the same line within the allotted character spaces. You also want the underlining to be printed on a separate line, so you must send a command to the printer to indicate this.

The semicolon (;) performs this function. Whenever the system encounters a semicolon, it commands the printer to perform a carriage return. To ensure that the report appears the way you want, place semicolons wherever you desire carriage returns. The semicolon between the words *date* and *reported* ensures consistency from one report to the next; the one between *reported* and the dashes ensures that the word *reported* will be underlined.

Enter the less than sign (<) as the first character of a heading to indicate that all characters following on the same line should be flush left. This is the same line as the command, not necessarily the same line on the report.

Now let's enter the second column:

```
002    10,DATE:SVC <RETURN>
HEADING:<DATE OF;SERVICE;- - - - - - -
 <RETURN>
```

You enter this column in the same manner as the first one for virtually the same reasons. Entering the width of the field as ten characters instead of eight leaves two additional blank spaces between this column and the next one. The heading is flush left (the less than sign), and the semicolons indicate carriage returns, ensuring that the title encompasses three lines.

If you were to print out these two fields right now, you'd see that the underlining appears on the same line. However, the next column has a unique problem.

The third column only encompasses two lines: the word *equipment* on one line and the underlining on the second line. If you enter the third column like the first and second, the underlining will be uneven. This is unacceptable.

Again, the solution is simple. Merely use the semicolon to enter a carriage return before the heading begins. Type the information:

```
003    17,EQUIPMENT <RETURN>
HEADING:<;EQUIPMENT;- - - - - - - - -
<RETURN>
```

The field width is now lengthened by two characters just as in the first two columns. The less than sign indicates that the title is to be flush left. The semicolon sends a carriage return to the printer, ensuring that the word *equipment* is placed on the same line as *reported* and *service* and that the underlining for column 3 is on the same line as for columns 1 and 2.

Enter the fourth column just like the third:

```
004    22,PROBLEM <RETURN>
HEADING:<;PROBLEM;- - - - - - -
<RETURN>
```

The next column presents the same problem as the first one. Because the word *technician* is ten characters and the width of the field is also ten characters, an extra carriage return is inserted. Again, lengthen the field width. Since the heading will encompass three lines, no preceding semicolons are necessary. Enter:

```
005    12,TECHNICIAN <RETURN>
HEADING:<NAME OF;TECHNICIAN;- - - -
- - - - - - <RETURN>
```

Enter the sixth and seventh columns like columns three and four:

```
006    22,WORK <RETURN>
HEADING:<;WORK PERFORMED;- - - - -
- - - - - - - - - <RETURN>
007    15,FOLLOW:UP <RETURN>
HEADING:<;FOLLOW-UP;- - - - - - - - -
<RETURN>
```

The last field needs no additional character spaces because it's the last column. Press return at column 008 and the report should begin to print.

The report should look like Cool Breeze Appliance Repair's report.

You can experiment with underlining, semicolons, and heading formats to produce the reports you require.

Underlining, for instance, does not have to end at the last character of the title, but can continue for the width of the field. Just remember not to place a character in the last character space of the field or you'll get that unwanted carriage return.

You can use semicolons in text to ensure carriage returns. For instance, if you're adding records and entering information in a long field (such as a description), you may want a single phrase to stand out. By entering a semicolon before and after that phrase, you'll be placing it on a line by itself when the report prints.

Since text is always flush left, it's usually best to make the column titles flush left too. However, numbers are always flush *right*, and, unless the title is flush right also, it won't appear to be in the same column. Make titles flush right by entering the greater than sign (>). For a description field, you may wish to center the heading.

To modify this sample report, type:

```
.MODIFY COMMAND FIGURE2.FRM
```

The suffix, .FRM, must appear after the file name in order to modify a report. When the report appears on the screen, you scroll to the line you wish changed and alter it with the same edit keys you'd use to edit records.

Through simple commands, the report generator becomes a much more powerful tool. Without programming. ***—Trish McClelland***

Business

Happiness Is an Overworked Computerholic

The results of Dewar's study of people in the computer industry might cause lines in its personnel offices—if it had personnel offices.

I'm not a drinker. My forays into the realm of hard liquor have left me sick and exhausted and repentant and in debt.

My only connection with the Dewar's company, makers of Dewar's White Label Scotch, is a series of magazine advertisements known as Dewar's Profiles, which depict interviews of young successful professionals and determine why it is that they do such and such and how compatible their lives are with Scotch.

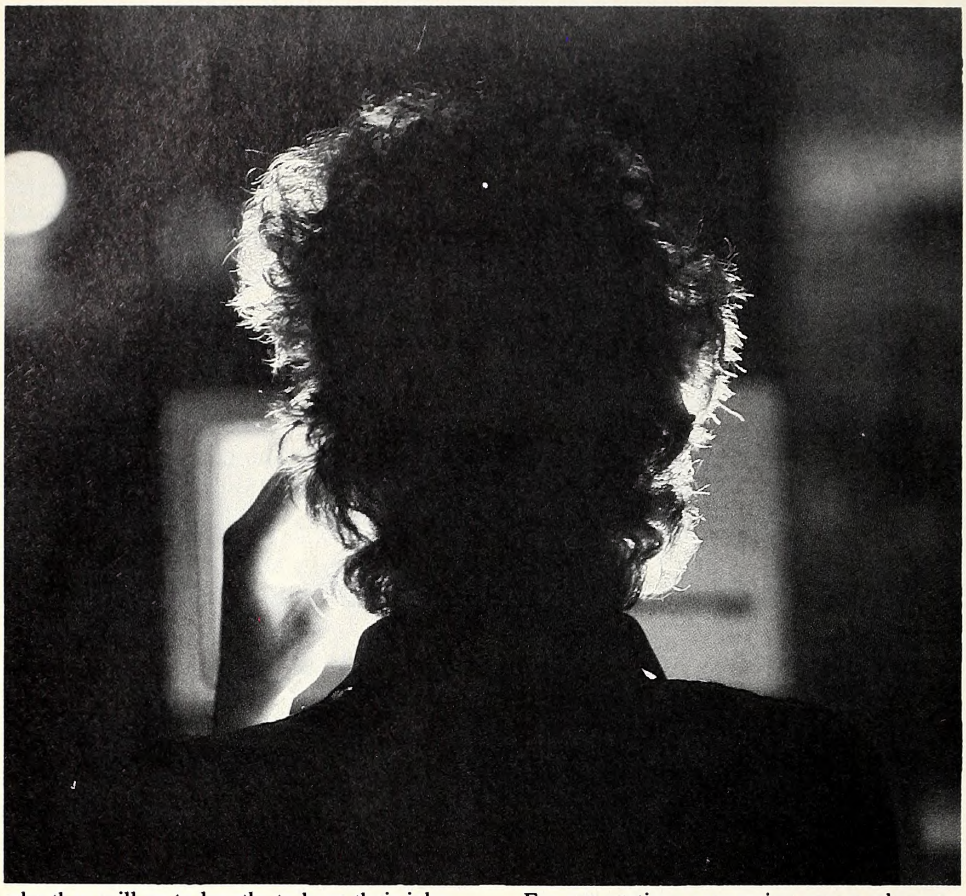
Dewar's profiles are expanding. The company has begun a series of booklets known as "The Dewar's Profiles of Americans at Work," based on interviews of members of various professions. One report in the series was entitled "Dewar's Career Profile: Computer Professionals," and the findings are worth examining.

The Dewar's report focuses on "six different types of computer professionals": educators, systems analysts, computer programmers, data processing consultants, entrepreneurs, and computer sales or marketing personnel. Among the more interesting findings is that 70 percent of those interviewed said they are "very satisfied" with their jobs, 24 percent are "somewhat satisfied," and only 6 percent were either "not very satisfied" or "very dissatisfied."

In addition, the Dewar's profile groups computer professionals into three work types—computerholics (a dicey term for somebody in the liquor business), overtimers, and nine-to-fivers. The largest group is the overtimers, who comprised 57 percent of those responding. They are described as those who work forty-one to forty-nine hours per week, occasionally on weekends. The next largest group is the computerholics, defined as those who work at least fifty hours per week and frequently work on weekends. They comprised 22 percent of those polled.

Upon reviewing these two sets of statistics, it is apparent that, while nearly 80 percent of people who work with computers work more than forty hours per week, most people who work with computers are very satisfied with their jobs. Sure, you say, of course: If you like your job you're willing to work overtime.

If they simply liked their jobs more than they might like other jobs, it would explain why they have the jobs they do, why they stay in the jobs they do for long periods of time, and even



why they will go to lengths to keep their jobs—including working some overtime. But so many computer professionals put in so much overtime that they can't just be doing jobs they prefer to other jobs. They must prefer their jobs to their non-work-related activities. Many work overtime not because they have to do so to get the job done, but because they like what they are doing more than they like doing other things.

The respondents were asked how greatly they value their leisure time. The majority—55 percent—said their leisure time was very important. But if they place such a high value on their leisure time, why don't they take more of it? The Dewar's poll further asked what rewards they seek in their leisure-time activities. Relaxation was the most common response. Everybody has to sleep sometime.

Okay, that's an exaggeration, but the point is that computer professionals are finding many of life's rewards in their work, and when they are not working they are more than likely just relaxing rather than pursuing some demanding hobby or developing an athletic expertise.

Job satisfaction is subjective; the Dewar's report factors satisfaction into halves: work experience (what happens at work, not work history) and expectations brought to the job. As far as expectations go, people who work with computers by and large know what they are getting into before they get into it. Computer science courses in colleges are legendary for being time-consuming. Patience and a willingness to work overtime are bred in such classes—or perhaps it's just that those without the required patience and enthusiasm are weeded out and encouraged to investigate liberal arts fields. When students of computer science are finally employed, they expect to work a lot.

For expectations concerning career advancement, Dewar's reports that 54 percent of those polled are "at least as far along as expected" when they began their careers, and 28 percent are "even further along." That comes to 82 percent who are at least as successful as they expected to be.

Work experience is broken down by Dewar's as the product of "meaningfulness, responsibility, and knowledge of results." No argument, but do meaningfulness, responsibility, knowledge of results, acceptable career growth, and fulfilled expectations fully explain why computer professionals are long-working and satisfied people? Or is something more involved?

An economist would say yes, money. Indeed, there have been instances of computer scientists turning out unbelievably advanced ideas or products and reaping equally unbelievable rewards. Computer money is like entertainment money—sports money, movie money, that kind of thing—it is highly visible but hard to get a hold of. If computer scientists and businesspeople went into computer fields strictly for the money, most of them would have given up by now. Although people in computer-related professions are generally assured of a comfortable income—even those who work forty or fewer hours a week—they have no assurance of wealth. Their overtime is not motivated by money.

If money has any involvement at all, it is that the computer profession has enough money available to investigate new avenues, try new tactics, enjoy the childishness of secrecy. People in computer fields often have the resources to do what they've always wanted to do in their garages but could not afford. Which raises the interesting point that many computer professionals are doing at work what they would otherwise be doing at home as a hobby, and that many nonprofessionals are just as devoted to their avocational computing.

There is a last factor, however, that perhaps best explains the results of the Dewar's profile, and, in addition, helps to explain why computer amateurs—hobbyists, hackers, gamers, and general muckers-about—can't wait to get home from their forty hours a week and put forty more in on their computers: play.

Computers—especially micros—are fun. They are fun to work with because they represent such a leap over the tools that used to be so prevalent. They provide an avenue for great inventiveness because they are new—for computer applications, imagination is the only limit. In some ways that has always been the message of the magazine you are reading.

Computers bring the fun of toys to the workplace. They are like Tinker Toys or Erector Sets—they represent an almost limitless potential. Devise a simpler user interface; draw a better hi-res picture; create a better sound. Make it faster, give it a better memory, sell it for less. Computer scientists and businesspeople thrive on challenge. Give them a problem and stand back. Or risk becoming part of the solution; they'll use whatever's at hand.

Fantasies come alive in the computer industry. Images of recluses working singly for long hours, cloistered in darkened offices poring over cryptic mathematic formulas or sounding the depths of language intricacies in order to devise a better game are not only common, they are true.

Also, because it is young and because it sprang forth in California, the microcomputer industry is fun. The competition makes such childlike things as secrecy and espionage possible. For example, a feeling of electricity sparked the air just before Apple unveiled the Macintosh.

In his book on stimulating creativity in the business environment, *A Whack on the Side of the Head*, Roger van Oech writes, "I've noticed that a fun working environment is much more productive than a routine environment. People who enjoy their work will come up with more ideas. The fun is contagious, and everybody works harder to get a piece of that fun."

Dewar's quotes Ed Young, a systems development manager at National Advanced Systems and one of their respondents, under the heading of "Personal Motivation: Career Goals and Rewards": "I like the instantaneous gratification of computers, and they also fit in with my desire to build things." It almost sounds like some kid evaluating an involvement with blocks.

Darwin Scott, another Dewar's respondent, says, "It's a fuzzy boundary for me between work and nonwork. I do computer-related activities with friends." Work and play fall together for Scott. If he spends upward of forty hours a week at work, the reason is apparent.

How about for the more famous computer professionals? Does play explain their devotion and intensity?

In his introduction to von Oech's book, Nolan Bushnell, the founder of Atari, writes,

IF YOU OWN AN APPLE® COMPUTER, YOU'VE GOT CONNECTIONS AT CHEMICAL BANK.

Connections you can use to do most of your banking right in your own living room.

Introducing PRONTO,® the home banking system from Chemical.

PRONTO offers money management and banking services 24 hours a day. And does it all with the help of your IBM, Apple, or Atari computer, and your telephone.

With PRONTO, you can check your balance, or check which checks have cleared.

Pay bills to over 400 merchants and services.

Or transfer money from one account to another.

And no matter what kind of business you conduct on PRONTO, it's strictly your business.

Because you'll be the only one with access to your financial information.

For a demonstration, use your connections and call us toll-free at 1-800-782-1100.

Or come into any one of our 260 Chemical Bank locations.

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"Personally, I believe that innovation is a lot of fun. This is what has motivated me to try the various things I've done. You see, I love to build. . . . The creative aspects of how something is put together, whether it's a toy bridge, or an array of integrated circuits, or a new company, really excite me." Later in the introduction he writes, "I've also found that innovative people have a passion for what they do."

Steve Jobs is the renowned model of the capricious child-chairman.

Bert Kersey, programmer and president of Beagle Bros, seemingly runs his company like an afterschool clubhouse, complete with mascot.

Mark Pelczarski likes to draw.

Steve Wozniak builds things in garages and throws money away at rock concerts.

Dave Gordon—well, Dave Gordon.

Al Tommervik takes naps.

To suggest that these computer industry leaders are children is insulting. To say that they know how to have fun like children, to lose themselves to enthusiasm like children, to study minutiae and dream of universes the way children preoccupy themselves with such matters is to pay them the compliment of carrying the richness of play into the adult world. Computer professionals stop and smell the roses. And pull off the petals and stab one another repeatedly with the thorns and play in the mud and have water fights and look for bugs. The computer industry has room for inventiveness, unorthodoxy, tears, fears, laughter, secretiveness, espionage, petty jealousy, games—it has room for fun.

In a product brochure, Datamost Software came up with this line: "Lucky for you we didn't listen to our mothers when they begged us to get real jobs."

I think that sums up the explanation for the Dewar's profile. It also explains why I am not a drinker: Scotch clashes with my chocolate milk.

—Todd Zilbert

Lifestyles

Priming Your Original Computer

Hold on! Relax. And don't bother typing this program into your Apple.

Working with computers makes things easy beyond speeding up work and providing magical diversion.

It's so easy to forget our bodies—to awaken after a spell to realize that our necks are cricked, stomachs growling, or hands cramped.

According to the National Institute of Occupational Safety and Health, computer entry is the number one most stressful profession—even more stressful than air traffic controlling. People who work long periods before a computer complain of a host of symptoms ranging from eyestrain, carpal tunnel syndrome (in the hands), backaches, and CRT radiation-related problems. In addition, psychologically related symptoms include alienation/detachment from people ("hackers' syndrome"), impatience with ambiguity (rejection of the existence of mixed feelings, pressure to be always logical and decisive), and fear/resentment of the machine.

Remember, you are in control. GSI, GSO, or, as they say in Silicon Valley, "Good Stuff In, Good Stuff Out."

Here is a program to take care of the most important element in the system—you.

```
10 REM  PROGRAM FOR HUMAN
       PRODUCTIVITY
20 REM  AND SATISFACTION
30 REM  IN PSYCHOPHYSICAL BASIC
40 NEW
50 GOTO 200
100 REM  SUBROUTINE: "TIME
       OUT/RENEWAL"
110 HOME: CLOSE EYES
120 M=PEEK (INSIDE): BREATHE DEEP
130 RELAX HANDS ON LAP
140 FEEL HANDS (HEAVY, WARM,
       TINGLING)
150 IF NOT RELAXING THEN GOTO 110
160 SPREAD RELAXATION TO LEGS
170 SPREAD RELAXATION TO TORSO
180 GENTLY RETURN
200 REM  PROGRAM: "AUTOGENICS:
       SILENTLY TALKING TO SELF WHILE
       BREATHING"
210 FOR X=1 TO 3: INHALE: PRINT "I am
       becoming";: EXHALE: PRINT "...more
       and more relaxed and alert with every
       breath."
220 NEXT X: REM  REPEAT THREE TIMES
230 FOR Y=1 TO 3: INHALE: PRINT "I am
       letting go";: EXHALE: PRINT "...of
       excessive tensions, worries, and fears."
240 NEXT Y: REM  REPEAT THREE TIMES
250 FOR R=1 TO 3: INHALE: PRINT "I am
       becoming";: EXHALE: PRINT " more
       and more confident and creative all the
       time."
260 NEXT R: REM  REPEAT THREE TIMES
270 FOR B=1 TO 3: INHALE: PRINT "My
       breathing is becoming smoother and
       deeper";: EXHALE: PRINT "...and I am
       becoming even more relaxed."
280 NEXT B: REM  REPEAT THREE TIMES
300 CALL RELAXATION MONITOR
310 IF NOT RELAXING THEN GOSUB 100
320 END
```

Psychophysical Basic runs slowly, at first. With running (practice), the program is automatically compiled into Biomachine Language (habit).

Many other subroutines are available and may be included to release accumulated muscle tension, prevent CRT eyestrain, and ergonomically increase creativity and user's friendliness.

—Robert Pater

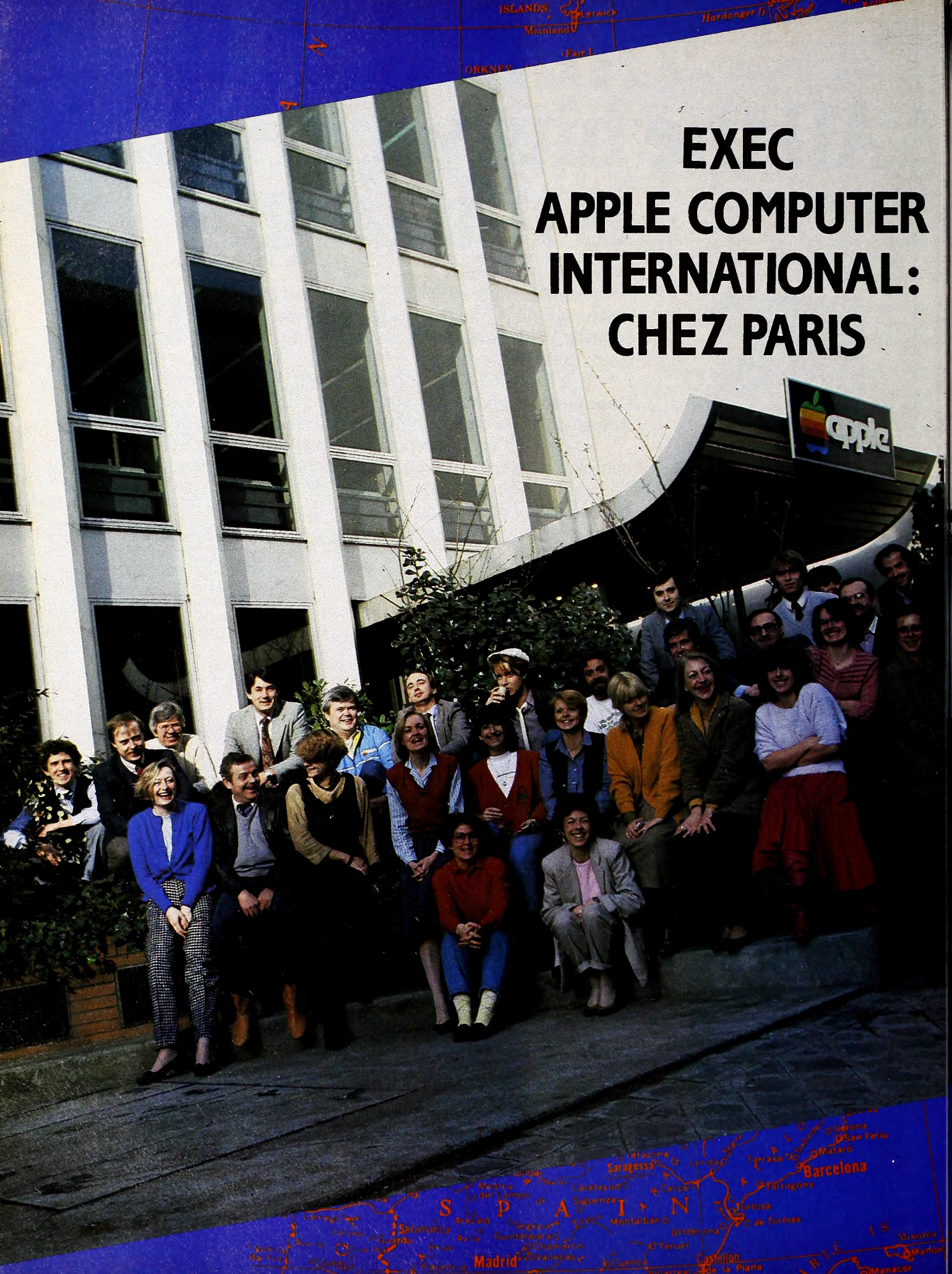
ATARISOFT.™
All the hits your Apple is missing.

If you thought you'd never find fun games for your hardworking Apple, happy days are here. Because now ATARISOFT brings you great arcade hits never before seen on your Apple screen.

Pick from Pac-Man,[1] Donkey Kong[2] by Nintendo,[2] Centipede,™ Defender,[3] Joust,[3] Jungle Hunt,[4] Moon Patrol,[3] Pole Position,[5] Galaxian,[1] Ms. Pac-Man,[1] and Battlezone.™

So dust off your joystick (or if you don't have a stick, you can play with a flick of your fingers on your keyboard) and ask your dealer for all the ATARISOFT hits. The software your hardware's been waiting for.

EXEC APPLE COMPUTER INTERNATIONAL: CHEZ PARIS



Our intention is not to put a wire into people's heads and hook them up to a database.

—Mike Spindler, Apple's vice president and general manager, Europe

There was a time not long ago when the prospect of an American phenomenon called the hamburger gaining acceptance in the culinary paradise called Paris seemed about as likely as D'Artagnan becoming one of the queen's most trusted champions in the first few chapters of *The Three Musketeers*. And yet, though hamburgers are not the meal of preference for the average Parisian, they have for the most part gone the way of D'Artagnan and found their way into the heart of many a Frenchman.

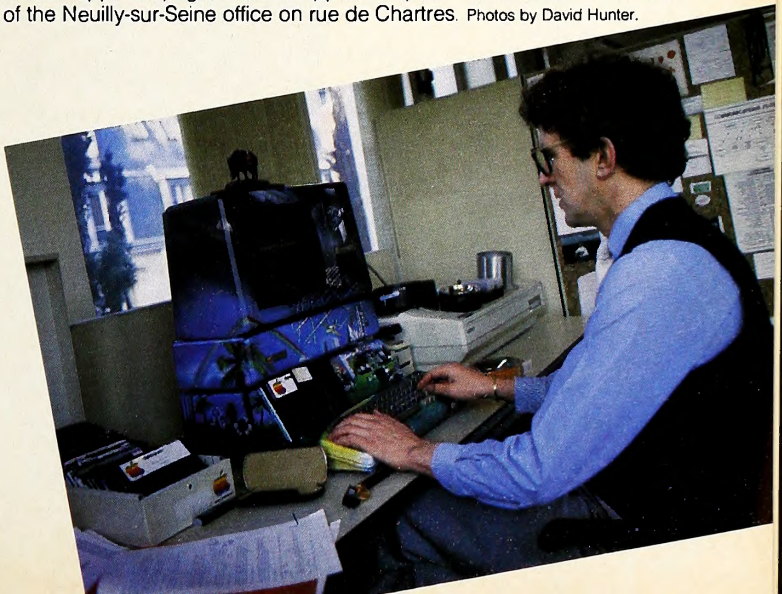
Hamburgers and personal computers, of course, are not often thought of as similar, but in the never-to-be-outguessed game of European marketing of American products, they share certain characteristics. The most obvious similarity is the time-lag factor. Europeans take great pride in their ability to cook good food, possibly the best food in the world. It'll take time for them to get used to the idea of forsaking the usual blanquette de veau for even an occasional Big Mac.

Likewise they have done without personal computers for the last two thousand years. But just as hamburgers have found a home on the avenue des Champs-Elysées and the boulevard St. Germain, so has a personal computer brand called Apple marched through the Arc de Triomphe on its way to widespread acceptance in the homeland of Lafayette and Victor Hugo. And as the Allied forces knew when they landed on the beach at Normandy, the liberation of Europe starts best on French soil.

An American Computer Company in Paris. Located on the rue de Chartres in Neuilly-sur-Seine, just outside Paris, Apple Computer International is the strategic planning center for Apple's efforts in Europe. Though the office is a stone's throw from the avenue Charles de Gaulle, which becomes the avenue de la Grande Armée at Porte Maillot and then the avenue des Champs-Elysées at the Arc de Triomphe, it is technically outside the city limits of Paris.

The purpose of Apple Computer International is to provide a centralized sales and marketing force for the introduction of new products and the formulation of Apple's basic European strategies. Apple Computer International, in its role as strategic headquarters for all of Europe, handles the introduction of a product and the setting up of initial marketing strategies and pricing struc-

Below, Apple Computer International's editorial services manager Jon Bruce demonstrates that all Apples don't have to be beige colored to be useful. Opposite page, most of Apple Computer International's staff in front of the Neuilly-sur-Seine office on rue de Chartres. Photos by David Hunter.



tures. After three months, the individual areas take over the responsibilities of managing a product.

Apple is present in most European countries—France, West Germany, the United Kingdom, Italy, Sweden, the Netherlands, Austria, Belgium, Denmark, Norway, Finland, Switzerland, Portugal, Greece, and Yugoslavia—as well as in Iceland, Turkey, Cyprus, Malta, and Israel. These countries have their own operations that are responsible for the day-to-day job of marketing and distributing Apples.

The most recent figures put Apple's sales outside the United States at 25 percent of the company's total sales, and Europe accounts for the largest part of this 25 percent. Apple has to be considered the leading personal computer manufacturer in Europe, though it is only in the last year that this distinction has come to mean much. By and large, Europeans have been slower to embrace the personal computer phenomenon than people in the United States.

The challenges of marketing American products, particularly personal computers, on the European continent make for quite a story. Localization—making a product suitable for a specific country—and distribution are the most crucial areas a company must concern itself with. But the larger question of just how welcome American companies are overseas cannot be ignored.

Phil Roybal, until late last year Apple's European marketing manager, says the situation in Europe is the same for Apple as for any foreign company. As long as Apple is creating local jobs, boosting the local economy—basically being a "good European citizen"—there are no problems with local governments. When spin-off job opportunities, such as dealerships, are created, they contribute to a positive balance of trade.

Late last year, Roybal stepped down from his European post of one year—which had him spending half his time in California and the other half in Paris. He says Apple's goal was to build up the organizations in each of the countries so that they could operate more or less independently, with only a modicum of direction from the Paris office—which, in turn, gets its direction from Cupertino. But before you get the idea that Apple Computer International is just a funnel for directives from the big boys in Silicon Valley, read on.

Mighty Mike. Once you've heard him talk and seen him pound the table a dozen times in as many minutes to emphasize his words, it's easy to understand how Mike Spindler landed the pivotal job of Apple's vice president and general manager for Europe. A native German who speaks several languages with ease, Spindler is much more than an efficient marketeer. Like Jean-Louis Gassée, the amazing individual who has made France Apple's most lucrative foreign market, Spindler is a persuasive messenger bringing the promised land of personal computing to the peoples of Europe.

"We are a consumer marketing company selling personal tools, which someone might accidentally call computers, through dealers. We're marketing these tools to individuals on a wanted rather than a needed basis. You have to start talking to the guts rather than the intellect, to the buyer's ego—to his ability to say, 'I want to learn about this because I think these tools will become part of my life.' "

Spindler's introduction to Apple occurred in early 1980. At the time, he was Intel's European marketing manager, working out of Brussels. Then, as now, Regis McKenna was Intel's public relations agency. One day Regis McKenna himself came by and

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Apple Computer International execs (top to bottom): Mike Spindler, vice president and general manager; Henri Aebischer, marketing manager, Apple II division; Bob Kissach, marketing manager, 32 division; Fred Bullock, product marketing manager for the Apple IIc; and Marek Milik, creative services manager. Photos by David Hunter

showed Spindler copies of American microcomputer magazines and basically said, "This is the next thing."

Spindler has worked his way down, so to speak, from mainframes to minicomputers to microcomputers. In the midsixties he helped engineer peripherals for mainframes at a company called Siemens. From Siemens, Spindler went on to Digital Equipment Corporation, where he eventually became involved with the marketing, largely through OEMs, of minicomputers.

It was while he was learning the art of the "technosell" that Spindler recognized the threat the semiconductor industry posed to minicomputer manufacturers by virtue of its ability to produce microprocessors. Spindler could see that advances in software, such as real-time operating systems, were going to undercut the minicomputer manufacturers just as that industry had once pulled the rug out from under mainframe suppliers.

Spindler saw the opportunity to participate in an exciting new industry and joined Intel. As it worked out, the semiconductor companies failed to recognize the chance to beat the minicomputer manufacturers at their own game. Thus, Spindler was primed to join an organization like Apple.

"For me, Apple was an opportunity to start again, to build a company and a market," Spindler recalls.

Remembrance of Things Past. In the late seventies, a man by the name of André Sousan set up independent arrangements with European import companies to buy Apples at arm's length. It was a primitive importing operation, with no marketing and sales support, that had limited success. Spindler calls it "a real buy-and-sell situation. The local distributor would do the best he could." To this day, Spindler believes that distributor is the wrong label to attach to the entity that moves machines in Europe. "It's a push market; we must be a marketing company."

Apple first entered the European theater en force in 1980. The company did three things immediately: built a manufacturing plant in Cork, Ireland, opened a large distribution center in the Netherlands, and implemented a management structure in the form of a marketing and sales headquarters in Paris.

Apple was fortunate to land the services of Jean-Louis Gassée, who has created an extremely strong dealer network in France. Gassée wrote the book on making Apples attractive to the French people. He formed a distribution company which he has since sold to Apple. Now, as director of Apple (Seedrin) SARL, he uses his strong character, active intellect, and personal love of Apple to point the way to success in the rest of Europe.

"We weren't promoting the idea of personal computers," says Spindler, "as personal tools for individuals in schools, businesses, and wherever to use for themselves. The existing market was more or less the old game of accounting, payroll, inventory. Everybody looked at the Apple II as a poor man's data processing unit that they'd hook up to a mainframe." Selling Apples as business machines took the personal out of personal computers, and it was Gassée who showed that Apples could appeal to the strongly entrenched cultural consciousness of Europeans.

Spindler feels that Apple is on the right track, moving away from the traditional, classical technosell method of marketing machines.

In addition to marketing Apples in a way that appeals to Europeans, Apple had to make a greater effort to localize software. "The people in the home office, as smart as they were, had more than enough to do. There was no easy way for them to localize the software that makes Apples so popular in the States."

Two for the Road. Last year, when John Sculley came on as president of Apple, one of the first moves he made was to simplify the structure of the company, forming two basic product groups—the Apple II division and the 32 division. At Apple Computer International, each of the two groups has its own marketing manager who reports to Spindler, who in turn reports directly to Sculley.

Henri Aebischer, a three-year veteran of Apple, is the marketing manager for the Apple II group. A native of Switzerland, Aebischer has a reputation for being a connoisseur of French cooking.

Aebischer took what he calls the "traditional path" for Apple's European executives. That is, he worked in the minicomputer industry, for Data General, before moving to the field of microcomputers. It was at Data General that Aebischer met Jean-Louis Gassée, who in turn introduced him to Mike Spindler. As an "old crocodile" of the computer industry, Aebischer brings years of experience to the job.

Though he believes that the Mac may eventually surpass the II family in total number of Apple units sold, Aebischer also believes that the "II will stay here for a long, long time.

"The Apple II began as a general-purpose machine, but as time went by it became a 'niche machine.' " explains Aebischer. Users, with a choice of some ten thousand pieces of software, began to use the II for specific vertical market applications. The sum total effect was that the market "appeared horizontal, but it was probably made up of many vertical segments."

The philosophy behind Apple's existing and future eight-bit machines is basically the same throughout the world: Take a winning product and improve it so it stays a winner. Aebischer defines Apple's philosophy as decreasing cost and compacting value. The brand-new Apple IIc (the c stands for compact) continues the tradition started with the Apple II Plus and IIe.

In addition to lowering costs and achieving a more economical design of the II, Apple is striving to increase functionality. That is why modern features like the mouse and integrated software—technological advances previously available only on the higher-

priced Lisa and Macintosh—are becoming standard options for the II family. "We don't want to strip the II of its functionality just so we can sell it for $400," says Aebischer.

Localizing Lisa. Aebischer cites the Lisa as an example of how good Apple has become at localizing products. "The strategy is to localize a product as soon as possible. Lisa was very complex. Here in Europe, we had all seven manuals for the machine translated and printed less than three months after Lisa started shipping in the States. It was a major task with a lot of nitty-gritty details."

Though up till now the acceptance of personal computers has been much slower in Europe than the U.S., Aebischer believes that the acceptance curve may be exponential. There are still hurdles caused by the economic environment, but the computer awareness of Europeans is on the rise. Almost as important as the pricing of products is the careful nurturing of the various cultures.

"The Latin countries love the personal computer concept. The French are very individualistic. Just drive in Paris sometime. The French drive crazily because they think they are alone on the road."

Germany, on the other hand, is a different story, according to Aebischer. "There they say, 'We are comfortable. Why should we try to improve our productivity?' Their attitude is becoming very conservative, even a little pessimistic perhaps."

At least four times a year Aebischer travels to the United States to meet with the folks in Cupertino, visit dealers, and look at the largest Apple market close-up. "All of us here read the U.S. press. The States are a kind of guinea pig for us. What happens there will happen here."

Aebischer believes that the tide may be turning. He attributes this to the increased visibility of Apple in Europe and to the existence of innovators, who take up the challenge of making personal computers useful for themselves. When a talented individual creates a program or application and shows it to someone, who in turn sees a need for his own machine, he is contributing to that curve.

Managing the European MacMarket. Although Macintosh was announced in Europe at the same time as in the United States, the machine is still not being shipped to European dealers in quantity.

Bob Kissach, marketing manager for the Apple 32 division, will have been with Apple's European troops three years come August. A native of Leeds in northern England's Yorkshire County, Kissach has a laugh that probably could be heard easily from the highest balcony seat in London's Albert Hall.

Kissach has worked with American companies for a total of fourteen years. Nine of those years were spent with Data General and included a stint in Marlborough, Massachusetts. He's been in Paris for seven years, first with DG and now with Apple.

"The experience we've gained from marketing the II and III in Europe has helped on a lot of levels with Macintosh and Lisa. Of course, the main task is localization. We've tried to put nothing inside a machine that is country-specific.

"There are needs to localize the power supply and the analog board, but the digital board is identical throughout the world." Likewise, says Kissach, the iconographic labeling over the ports on the back of Macintosh's case means the case can be the same for any country, regardless of the native language.

"Usually it is very difficult to localize software. Someone would have to go through the source code and translate it manually. With Macintosh there are resource files that allow us to change messages, menus, dates, times, sorting sequences, and character sets. With one of these resource editors we can stretch a dialog box to fit a specific language." This can be crucial.

English is a very compact language compared to, say, German. An item on an English memo that is seven characters long may require over ten characters in German.

In addition to recognizing the importance of localizing products, Apple has learned that software sells machines. "We're trying to re-create the II phenomenon," Kissach says. "The Macintosh is totally open to developers."

Kissach has been involved with the Macintosh product for more than a year and a half. The announcement of the machine in January was attended in Europe by the same razzmatazz and press coverage that made the U.S. introduction of Macintosh such a media event. Kissach and others attribute a lot to Lisa for the overwhelming acceptance of Mac in Europe. Although few people seemed to be able to afford the high-priced Lisa when it was first introduced (the price was the equivalent of $12,000), the machine generated great interest.

Apple is also trying to foster, says Kissach, a more evenly balanced exchange of software. This means that a software company in France should think of selling its products not only in the United States but in other European countries as well. The fact that software for the Macintosh can be easily translated is helping this effort along considerably.

Cooking Up a Consistent Look. Marek Milik is Apple's creative services manager for Europe. His job is to maintain the consistency of Apple's graphic look throughout the Continent. The graphic look includes brochures, packaging, magazines, fliers, print advertising, and television commercials—anything the public sees.

Milik says that people in the States don't often realize the enormous differences there are between countries in Europe. "Here, flying from San Francisco to Los Angeles is the equivalent of flying from London to Paris, London to Rome, Paris to Zurich. And each time you're experiencing completely different nationalities, languages, and ways of thinking. Our job is to transform the Apple graphics, which all originate in America, so they look European."

It is crucial, says Milik, for an American company to play down the fact that the product being offered is American. "A Frenchman wants to buy something French, or at least buy something that is not crammed down his throat as American. It's getting better now, but in the past Apple's graphics have been very Californian."

The problem of localizing, but not overlocalizing, Apple's image is a complex one. "A Frenchman also doesn't want to buy something that looks too German or too Italian." Up until last October, says Milik, all the designs of brochures and packaging for the various European countries originated from the Paris office. Now that this aspect of Apple's European operations has been decentralized, there is a real effort to make sure that the individual areas—all of which now have their own communications and marketing departments—don't radically change Apple's overall public image.

"You have to rationalize some," Milik says. "There are a thousand little things that the individual areas have to do, but they can't start changing the big things, like the packaging and the brochures."

Milik works closely with the creative managers of the various individual countries, as well as with Cupertino. "In the States, I've told them that if you shoot a picture of a man sitting at a desk, take the telephone off the table. It's not that we don't have telephones out here, but they're slightly different in each country. So take it off, or shoot six or seven versions of the picture."

Another telling example of the problems of localizing graphics is found in the packaging for the IIc. On one side of the United States box is a picture of a smiling woman in blue jeans holding a IIc. In Germany, for instance, this concept would not work well. So the picture was changed to three businessmen in an

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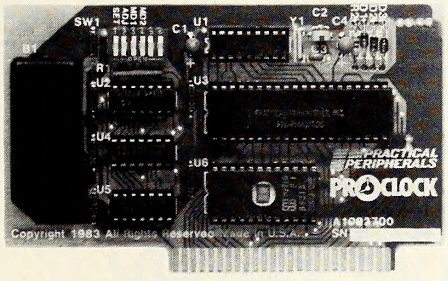

PROCLOCK is the first Clock/Calendar designed for ProDOS-based systems as well as other Apples running DOS 3.3, CP/M**, Pascal, Applesoft*, and BASIC.

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elevator; two are carrying briefcases and one is holding a IIc.

International Signs of Modern Times. Apple's chief competitor in the United States is IBM, and Big Blue (or the Big Letters, as Spindler refers to the largest computer firm in the world) is gaining momentum in the European personal computer market. IBM has been slow to enter the European market; the PC*jr* and Portable PC are still to be introduced—"It's a case of pick your rumor as to when," says Kissach.

Even so, Kissach and Apple recognize that IBM can have the same effect in Europe that it did in the United States—that is, it can help legitimize the market. Up till now, says Kissach, some people have viewed the IBM PC as a "me too" machine. "IBM is a well-respected name here," Kissach says, "but it doesn't have the same magic that it has in the States.

"But they're moving. Already we're seeing a polarization occurring with the dealers, where stores are starting to carry Apple, IBM, and maybe one other brand. Even in Europe it seems to be shaping up into a two-horse race, though Victor—which entered the market a year before IBM—has sold quite a lot of its machines here."

Regardless of IBM's strategies, Apple remains secure in its own still-developing attack. Fred Bullock, product marketing manager for the Apple IIc, puts it this way: "Apple's first priority is not to be IBM-compatible but to be the best." Spindler too feels that, particularly in Europe, Apple has little to fear from the Big Letters as long as product and not name is the main focus.

"If you say that a machine has MS-DOS compatibility, what does that mean to the first-time user? Nothing. We're trying to move away from that world of a data processing elite, with their blue suits and a huge programming staff. Distribution means growing sales, not a growing technical support staff."

Fruits of Technology Over There. Free to do its own thing, Apple is clearly on the road to explosive growth in Europe. The last year has seen sales double in France. Kissach believes that if the German market picked up, the European scene would be spectacular.

"This whole business is communication," says Spindler. "We're our own worst enemy. I go to Cupertino once a month to discuss changing resources, product allocations, and future definitions of markets. We engage in a sort of body language with dealers. Dealers are very important in Europe. We try to convince them that Apple is a partnership, not dominance, not George Orwell."

Inseinely Great. With all this talk of marketing, localization, and cooperative strategies, very little mention has been made of what a delightful group of people work at the Paris office. They now number about forty-five and there's hardly an American in the bunch. Editorial services manager Jon Bruce, when he is not producing six or seven different documents in what he calls the "midatlantic" style of writing, produces the cheerfully irreverent Apple Computer International employee newsletter, called *Apparis*. Flipping through past issues gives a reader a privileged look at a group of people who care very much about their work, but also about having fun—people who know how to keep a sense of humor even when they work long hours and wear many different hats.

Apple Computer International is reminiscent of the early days of Apple—the enthusiasm, the excitement, the uncertainty about what will happen next. Henri Aebischer says that hardly six months goes by without some radical change occurring on the European front. That the changes have been mostly for the good should give Americans encouragement. In personal computing, these Europeans are not behind us trying to catch up, they're creating something brand-new—just as they did when they carved the Americas out of the New World. We can learn from them as they have learned from us. ■

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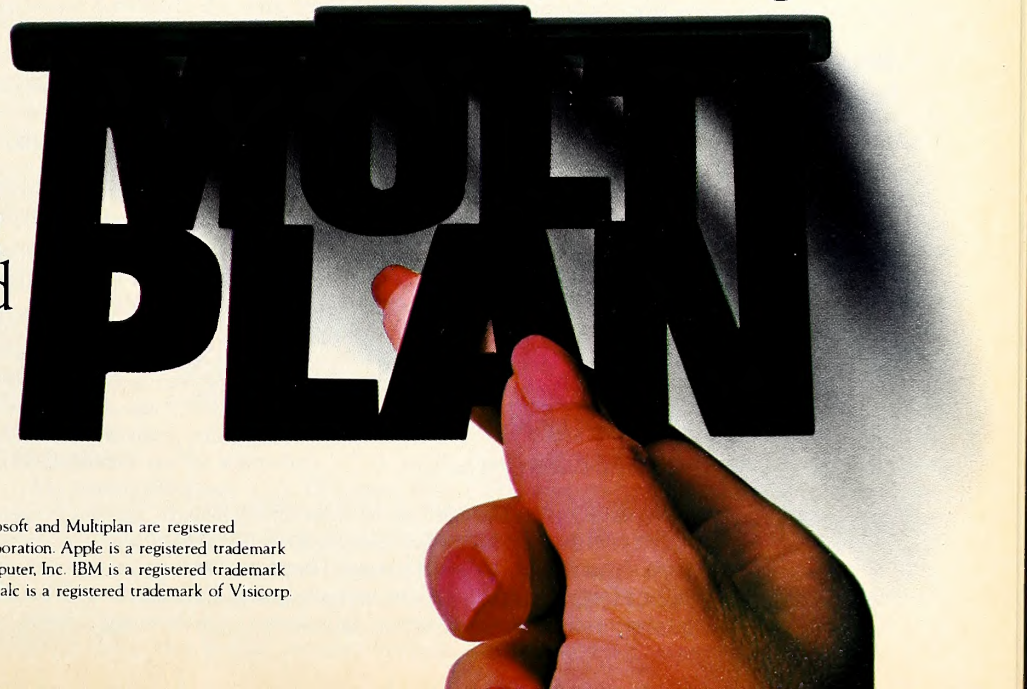

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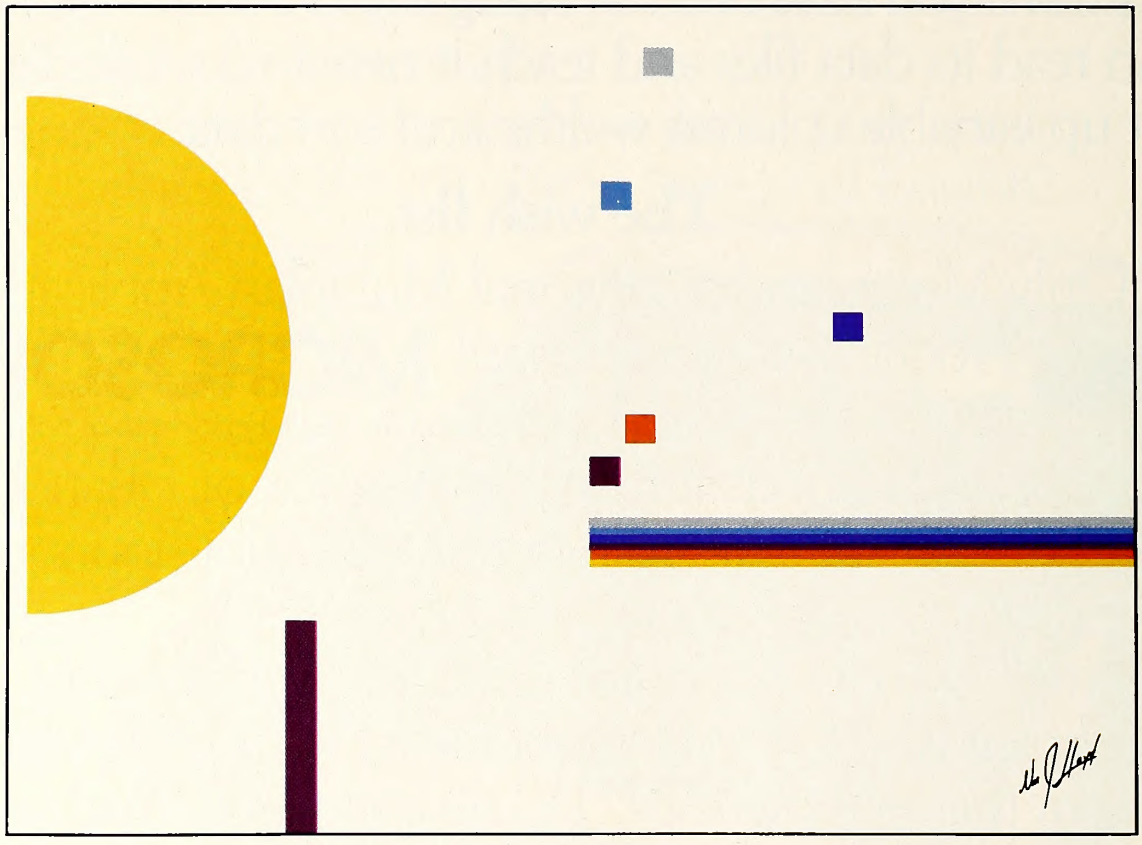

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abc

Mind Your Business

BY PETER OLIVIERI

Can summertime be almost here? It certainly can! And perhaps after a long winter, your trusty Apple could use a tune-up. More about that later. We have quite a variety of subjects to cover this month. In the course of things we'll make good on leftover promises, introduce some new topics for discussion, and continue to develop ideas that have been presented over the last few months. So why not pour yourself a bit of lemonade, put your feet up, sit back, and relax.

Continuing Communications. Last month we talked about telecommunications and its impact on microcomputer users. This time, we'll address a specific question that a number of readers have asked, namely: What factors should be considered when selecting a modem?

As you'll recall, a modem is the device that's connected to your Apple and serves to link your machine to another computer. There are five factors to consider when selecting a modem:

1. *What kind of interface does the modem require?* What, you may ask, is an interface? Well, your Apple must somehow connect (interface) with the modem. If you're going to use the telephone lines as the means of transmitting data (there aren't many other choices available to most of us), then you need some sort of connector. Since modems use the serial method of transmission (one bit after another), the interface connected to your machine must also be serial. Some micros have this interface—which is usually called an RS-232 serial interface—built in. An RS-232 interface is also available via some sort of communications card that's designed to be placed in one of the vacant slots of your Apple. Some modems come with this card, while others require that it be purchased separately.

2. *At what speed will the modem send data?* Common speeds are 300 baud (bits per second) and 1200-baud. Faster speeds are possible, but they're not really appropriate for use over telephone lines. The faster the transmission speed, the faster information is obtained. For example, using a 1200-baud modem would enable you to transmit or receive a twelve-page report in the same amount of time it would take to send or receive a three-page document at 300 baud. If you're paying for the time it takes to send and receive files (either as part of your phone bill or in the form of charges for using one of the information services), then getting a 1200 baud modem might well be worth the extra expense. Look around; some modems offer switch-selectable speeds.

3. *How does the modem connect to the telephone?* Most modems take advantage of a common telephone jack (one of the newer ones, not the old four-prong type). This is by far the best connection method, resulting in a transmission that is more noise-free and allowing for some nice features, such as automatic dialing. The alternative is to get a device called an acoustic coupler—a small unit into which you place the telephone handset. Though different from a modem, an acoustic coupler serves essentially the same purpose. Acoustic couplers are cheaper than modems, but they are also less reliable.

4. *What software is available to support communications with this modem?* This consideration is certainly an important one—after all, it was probably the software that facilitated a lot of those nifty things that made you want a modem in the first place. Make sure, at the minimum, that the software you get allows for easy transfer and printing of files. And of course, it might be a big plus if this same software also made it possible for you to communicate with a variety of host computers.

5. *Are there any extras included with the modem package?* Some packages offer special features, such as the ability to answer incoming calls to your computer automatically, the capacity to remember several telephone numbers and automatically dial them at your command, and the ability to dial up an information service late at night (when rates are cheaper) and retrieve the data you need.

The Magic Numbers. If you're interested in telecommunications and you've decided to purchase a modem, the next obvious question concerns where or whom you might call.

Certainly, many business people use their modem-equipped micros to communicate directly with their company's main computers. This enables them to enter or retrieve information directly (either at home or at work) from existing resources. It's also possible, of course, to communicate information from one microcomputer to another (the Apple at home can communicate with the Apple at work).

A modem-equipped Apple can also be used to connect with and obtain information from one of several commercial on-line information services. These on-line sources provide access to programs, news, classified ads, and a variety of special services. Among the information services available are the following:

The Source (McLean, VA). UPI news, business databases, financial information, airline schedules, electronic mail services, user bulletin boards, and various consumer-oriented databases. For information, call (800) 336-3366.

GTE Telenet Medical Information Network (Vienna, VA). This service provides information of interest to physicians, nurses, therapists, and pharmacists. It includes electronic mail services, bulletin boards, access to medical databases, and information from several medical journals. For information, call (703) 442-1900.

Newsnet (Bryn Mawr, PA). Provides complete information from more than 150 different business newsletters. For information, call (800) 345-1301, (800) 527-8030 in Pennsylvania.

Dialog Information Services (Palo Alto, CA). Has one of the largest collections of databases available. For information, call (415) 858-2700.

More than Just Graphs. In a previous column, we took a look at some of the major business graphics packages. The primary purpose of the packages we examined at that time was the production of relatively high-quality business graphs—mainly bar charts, line graphs, and pie charts. Some of the specialized packages also allowed the user to create organizational charts, flow charts, and schematics.

If you're really interested in graphics, it's very possible that you would like to do something that the packages we've evaluated so far don't allow—namely, animating your own pictures. If incorporating animation into our presentations meant having to acquire programming expertise, most of us would not bother. The task is reasonably complex and tedious, and, we'd likely conclude, not worth the time that would have to be invested. Fortunately, there's an alternative to this long process, a package that's well worth the time one must invest in learning to use it.

The package is Accent Software's *TGS: The Graphic Solution*. This complete animation system can provide creative computer users with a variety of possibilities to incorporate into sales presentations, training aids, educational presentations, graphs, and charts. *The Graphic Solution* can be used to combine text and graphics via much the same approach you'd take if you were creating a motion picture. First you create the actors (your shapes) and then you manipulate them "on film."

TGS runs on any Apple II with 64K (actually, there are versions requiring only 48K, but the extra 16K is well used). It will take a few hours to learn all the features of this fine package, but your time will be well rewarded. *TGS* gives great feedback—when you have created an animation and you see it work, the feeling is terrific!

Essentially, what takes place is this. You create your shapes on a low-resolution screen using very simple cursor movements. Whenever you wish, you can jump to the high-

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- "This 'simple' checkbook program has got to be the best thought out, designed, debugged, and user friendly applications software in existance. I use it to manage my own finances but it has completely replaced some rather expensive and well known bookkeeping software in my two busy practices." Dr. Arthur Epstine, Roslyn, NY.
- "The program is fabulous—I love it." Richard Rodney, D.D.S., Toronto, Canada.
- "The program is both easy to use and a very helpful addition to my software library. The most useful features are the automatic totaling of categories and the automatic retrieval of split entries." Louis Wofsy, Burk, Virginia.
- "As promised, it is not only easy to learn but an extremely valuable tool for keeping tax deductible items readly at hand." H.M. Stover, Yountville, Calif.
- "You guys are great!" Dick Palmer, San Diego, Calif.

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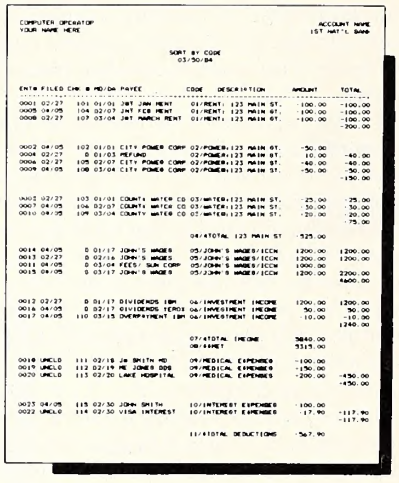
6. List deposits
7. List un'cld checks
8. List un'cld deposits
9. List all entries
10. Sort by date cleared
11. Print check registry
12. Print selected month
13. Print selected code
14. List code totals
15. List monthly totals



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15 Ready-to-print reports!

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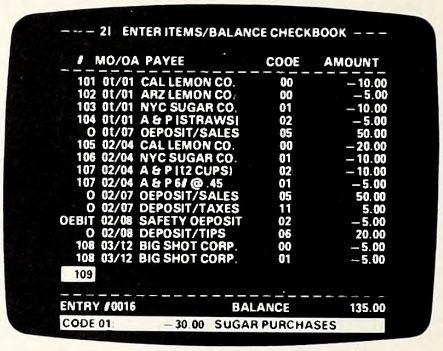
How it works. On your computer screen, you create a facsimile of your checkbook. You see 17 items per screen and can scroll for more. As the computer balances your checking account, you giv each check or deposit its own category code. You get 100 you name'em codes. Press Ctrl-O and see a code dictionary. To set up codes, just type them in. You can add, delete or change code labels any time without affecting data.



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Dealers: Write or call for price list

resolution screen to see what the object you're working on looks like. Once you've created a shape, you can save it to disk. If you've created some shapes using other packages, *TGS* can handle them also. And if you prefer to use a KoalaPad or a Gibson light pen instead of moving the cursor via the keyboard, you can purchase an expansion module from Accent Software that ties *TGS* directly to those input devices.

Once you've created a shape, you're ready to move into an animation mode where you can trace a path for your shape using simple keyboard commands. From here, you can move into show mode, which allows you to review your film at any stage. A speed mode enables you to control the speed at which a given frame, a set of frames, or the entire film, is shown. Also available are line mode, circle mode, and text mode, all of which permit you to add various enhancements to any drawing you've created.

The *TGS* package contains two disks, each disk holding a copy of the main program. On the back side of the first disk is a set of sample sequences (animations) and shapes for you to examine and use. On the back of the second disk are some effective demonstrations of what can be done with animation. Looking carefully at these sample shapes and sequences can teach you a good deal about the program.

In addition, Accent Software provides an excellent user guide. This guide is thorough, readable, and long—nearly two hundred pages. And yet it is not verbose; the examples it presents are clear, concise, and useful, and they help make the text a very effective tutorial. If you follow along with what's requested in each chapter, it's very hard not to learn the special features of *TGS*. The exercises at the ends of chapters are particularly worthwhile. They do a good job of introducing some particularly nice aspects of the package.

So if you want to have some fun with graphics or have always wanted to create some animated sequences with your computer, don't pass this one by.

Take a Tablet and Call Us in the Morning. With all the interest in graphics these days, it's not surprising that various new devices have emerged to facilitate the input of such material to the computer. If you're thinking about adding a graphics tablet to your system, you might want to investigate the following products:

Powerpad (Chalk Board, Inc.). This low-cost product plugs into a game slot, has a 12 x 12-inch drawing surface, and is a good children's tablet.

KoalaPad (Koala Technologies Corporation). A functional, inexpensive first tablet with good resolution, KoalaPad plugs into a game slot, and has a 4 x 4-inch drawing surface. Much software is being developed for it.

Hi Pad (Houston Instruments). This is a high-end professional graphics tablet that's especially useful in science and engineering applications.

Apple Graphics Tablet (Apple Computer). Well designed and manufactured, this is a sophisticated high-end tablet with plenty of available software.

Clean Up Your Act. When was the last time you cleaned your machine? If you're like most users, you don't remember. If you don't give your machine some special attention on a regular basis, you're taking a serious risk; your Apple is more sensitive than you may realize.

Keeping your Apple clean means more than just keeping a dust cover over your machine, its disk drive, and the printer (you do that now, right?). Here are some spring/summer cleaning suggestions:

1. Turn off your Apple and detach the power cord from the back of the machine. Then remove the cover and look inside. Is it dusty or dirty in there? If so, clean it. Do not use detergent; a can of compressed air of the sort photographers use to clean lenses and negatives might help here. While you're at it, remove each peripheral card and clean its edges—an eraser can be a good tool for this.

2. Buy a brand-name disk head cleaner and use it to spruce up your disk drive. Dust, dirt, human hair, smoke, oil from a heater, food, and aerosol spray mists can all be hazardous to the health of your disk drive. It needs regular cleaning.

3. Check your printer. Pieces of paper, ink from the ribbon, and dirt can easily undermine its sensitive mechanisms. Clean it thoroughly and replace used ribbons and print wheels.

4. Clean the outside of all your equipment,

using one of the cleaners sold at your computer store or data processing supply house. These cleaners have been designed specifically for use on computer equipment.

5. Take preventive maintenance seriously. For starters, this means getting a dust cover if you don't already have one (and then using it!).

Preventive maintenance also means being aware of problems that can arise from static electricity build-up. Special carpets and sprays can be quite helpful in preventing problems of this sort. Also, it's essential that you use grounded outlets—if you're not doing this, or if you're not using the two-prong adapter properly, you're asking for trouble. Static electricity can easily destroy a chip, a disk, or even a microprocessor.

Power surges, power outages, and brownouts can also cause problems for your Apple. You may need to buy additional equipment designed to prevent serious damage to your computer resulting from external conditions over which you have little control. Don't wait until something happens—plan for it.

Apple III Things. One of the more popular products for the Apple III has been Apple Computer's own word processing package, *Apple Writer III*. Now this package has been upgraded. Among the noteworthy features of the new version are significantly improved documentation, provisions for easier cursor control, a built-in interface to *Apple Speller*, a template for the numeric keypad that identifies many of the more commonly used commands, and a new utility disk that facilitates the transfer of files from *Apple Writer II*, *Mail List Manager*, *Quick File III*, and *VisiCalc*. If you're still using the old version of *Apple Writer III*, you just might want to visit your dealer.

And while you're there, you might want to inquire about the availability of the new Apple III manuals. In particular, you may find it helpful to look over the *SOS Device Driver Writer's Guide* and volumes 1 and 2 of the *SOS Reference manual*.

If you're one who likes to take a break now and then, you've probably been frustrated more than once that some of the great games for the Apple II can't be run on your III. Now there's a plug-in card, Micro-Sci's Game Port III, that gives your Apple III an Apple II game port. With it, most Apple II game software will run on your III. You must, of course, be in emulation mode, but that should be of little consequence.

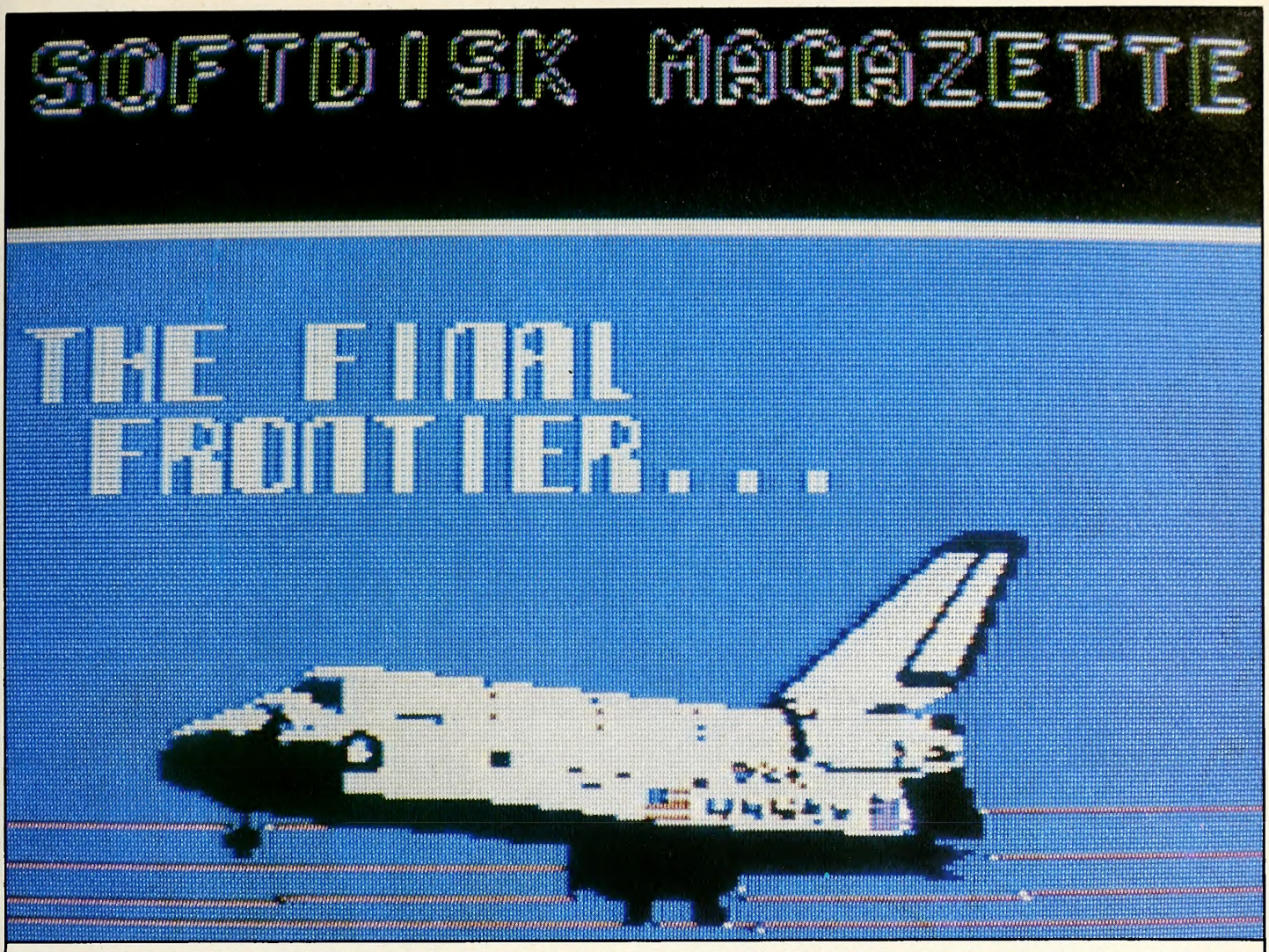
Bugging a Bug. In a P.S. to a recent letter, one of our Business User Group members asked for a brief explanation of a term she had seen in an advertisement. The mystery item was something called "spooling."

It's a good bet that the advertisement in question had something to do with a printer. Essentially, microcomputers can do only one thing at a time. Fortunately, because they are so fast, we don't ordinarily experience much of a delay as they go about their business—except when it comes time to print out whatever we've been working on. When a document is sent to the printer, the computer itself has to wait for the printing job to be completed. And since the printer usually operates at a much slower rate than the computer, an unnecessary delay occurs. Never mind that you're eager to get on with your next task; you must wait until the computer is ready.

The solution is to put what has to be printed in a special memory area from which it can be fed to the printer. Then the rest of the computer can go back to work. The process by which this is accomplished is called *spooling*, which can be managed in either of two ways—through the addition of a card containing the appropriate memory chips (the card is added to your computer, to your printer, or to a box in between), or through software that places the information in an available part of RAM while the system continues with other tasks. (This second choice is the more limiting of the two.)

If your computer spends a lot of its time printing reports and lists, you might want to think about adding such a feature. Check those advertisements again—maybe they'll be clearer now. ■

Accent Software, 3750 Wright Place, Palo Alto, CA 94306; (415) 856-6505. Apple Computer, 20525 Mariani Avenue, Cupertino, CA 95014; (408) 996-1010. Chalk Board, 3772 Pleasant Dale Road, Atlanta, GA 30340; (404) 496-0101. Houston Instruments, Box 15720, Austin, TX 78761; (512) 835-0900. Koala Technologies Corporation, 3100 Patrick Henry Drive, Santa Clara, CA 95050; dealer information numbers (800) 227-6703, (800) 632-2801 (in California). Micro-Sci, 2158 South Hathaway, Santa Ana, CA 92705; (714) 241-5600.



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80/40
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disk use
power
esc
delete
tab
control
return
shift

Apple II Forever!

A Baby Apple That's Nobody's Junior

BY MARGOT COMSTOCK TOMMERVIK

Perhaps the most remarkable quality of the Apple II has been its durability; it doesn't take a cynic to ponder just how long the now-seven-year-old computer can continue to dominate—yet just when we wonder about it, some innovator plumbs a new depth in this remarkable machine. And we realize once again that we still don't know its limits.

With the Apple IIe, corporate Apple indicated that it didn't consider the Apple II a dead issue either; but the IIe's innovations were updates more than breakthroughs. The news on the creative front at the time was Lisa. Macintosh, arriving a year later, set rumors flying again about the remaining life span of the Apple II.

Introducing the Apple IIc. Creative and innovative, and hard news in its own right, the IIc flies in the face of our cynical moments—and Apple knows it. With the advent of the IIc comes a new slogan that leaves no doubt what Apple Computer Inc. thinks of the II product line: *Apple II Forever!*

It isn't what's inside the computer that's the biggest news. The IIc is at heart a full-bodied IIe—128K with double hi-res, complete full-size IIe-configuration keyboard, eighty columns (with a toggle for forty), and upper and lower case standard (with lower case accepted even by Applesoft).

It's the outside that's spectacular. Weighing in at seven pounds—with disk drive built in—the IIc is a natural winner.

Seven pounds. Less than a bag of groceries. A lot less than a bowling ball. About as much as a newborn baby. Probably less than your briefcase on a busy day—which, incidentally, it will fit into. In planning the IIc, the Apple design team combed the stores for small briefcases, determined that the new Apple should fit into the smallest of them. As a result, the IIc is eleven inches wide, twelve inches deep, and two inches high.

The Apple IIc is a computer system that you can pass to a friend across the table with one hand.

You can stick it in a desk drawer when company comes.

You can stuff it under the car seat while you're at the beach. With the battery packs promised soon, you can take it to the beach with you.

And when your next-door neighbor comes borrowing, you can hide it under the soap. Well, almost.

IIc or Not IIc. Skeptics needn't take Apple's word. Developers too are jumping on the IIc bandwagon—responding possibly even more vigorously, though not more excitedly, to the baby Apple than to Mac. More than a hundred developers exhibited products at Apple's April 24 bash at Moscone Center in San Francisco, where the IIc was introduced to dealers. Almost all Apple II and IIe software runs on the IIc, but its extended capabilities open up new avenues for developers, or make feasible some old ones that weren't economically sound before—like 128K programs. (Publishers are understandably reluctant to address memory-enhanced machines to the exclusion of off-the-shelf configurations.)

Only a few developers already have products specifically created or enhanced for the IIc. Broderbund has modified its new *Print Shop* to print out in color on the IIc's three-hundred-dollar companion Scribe printer; the Broderbunch also demoed a not-yet-titled mouse-run double-hi-res graphics package by David Snider, facetiously referred to as "David's Midnight Mousepaint."

Scholastic claimed the "first original program for the IIc" to be their *Fact and Fiction Tool Kit*, a dual program for people at least eight years old. Mouse-driven and illustrated in double hi-res, *Fact and Fiction* contains Story Maker, which teaches creativity through writing and clip art illustration, and Secret Filer, an easy-to-use electronic filing system that's intended to teach logical thinking, organizational skills, and how to use databases.

Double hi-res is a popular enhancement that IIe owners (with later motherboards than revision A) can enjoy; Penguin Software leads the pack in converting its line of adventures and graphics utilities to display sixteen hi-res colors.

Nor is hardware to be forgotten. The disadvantage of the IIc is its lack of expandability; it has no slots. Not a one. What the IIc does have is a slew of ports: two serial RS-232 ports, presumably for printer, plotter, or modem; an extended video port for RF modulator, RGB, or liquid crystal display; an RCA standard composite video port for color or monochrome monitor; an external disk drive port (with controller built in); and a mouse/joystick port.

Street Electronics gets a head start in hardware with The Cricket, a voice, sound effects, and music generator combined with a clock. Not wanting to leave IIe owners out in the cold, Street simultaneously announced the Alpha-Bits serial interface, a plug-in board that emulates the IIc's serial ports in the IIe.

So the IIc's lack of expandability may merely come down to the difference between plugging jacks in the back and lots in the slots.

All the News That's Fit IIc. The Apple IIc has inspired more than a slogan; at its launching party in San Francisco, Apple revealed major marketing changes in look and policy for almost all its packages and products. The IIc's oysterlike just-off-white color is heralded as the official Apple color and its "overall look"—one assumes Apple refers to the European-looking italic keyboard lettering, the long, slender air vents, and the beige keyboard—as The Apple Look for the future.

The outside packaging is no less a change. No more sedate white boxes with the Apple logo. The new look's packaging is brightly colored, with peppy photos on every side—predominately red for Apple IIs, blue for the thirty-two-bit Apples. Manuals, disk jackets, and disk labels are all to follow the theme. It's fresh and slick and tailor-made for the mass consumer market.

It's a good question whether, at just under thirteen hundred dollars, the IIc is a mass consumer product. Apple's betting that it is. At list, the three-hundred-dollar Commodore 64 seems a whole lot cheaper—until you add on its six-hundred-dollar disk drive. The IIc's got the disk drive built in and double the memory. When the difference is four hundred bucks instead of a thousand, the masses may start massing.

Lust for Power. The reason Apple calls this eminently carryable computer transportable—a word generally reserved for anything that can be moved from place to place by truck or train, for instance—as opposed to portable is a valid one, even if it destroys a perfectly good word to make its point. *Portable*, according to Apple, means capable of being used in the process of being carried around, like a portable radio. *Transportable*, says Apple, means capable of being moved from place to place fairly easily, but not usable in transit. As it's being released, the IIc, like the "transportable" Mac, needs an electrical outlet to run.

Actually, it needs more than an outlet—it needs a power supply. The one that comes with it weighs about a pound and a half and is about the size and shape of a small brick. Apple is encouraging people who plan to take their IIc's back and forth between home and work to purchase an extra power pack to avoid the need to transport it, too. At forty dollars, that's not a bad idea. Besides avoiding extra weight, Apple's choosing not to build in the power supply makes using the IIc with a battery pack (which, presumably, makes it portable at last) more attractive.

Also not included in the IIc system is a monitor. Apple expects many buyers to opt in favor of using their television sets as monitors—so much so that an RF modulator is part of the package and all mentions of eighty-column mode sport warnings against trying to use it on a TV set. It's okay for the moment; even business travelers can make do with televisions as monitors in hotel rooms.

To get the most out of the IIc's eighty columns, though, you do need a monitor, and Apple has designed one, priced at around two hundred fifty dollars; it's tiny and fits right in with the IIc. It sits on a stand elevated just enough above the IIc to let air circulate; the legs of the stand curve forward from the back of the monitor so the monitor is cantilevered over the computer.

That's now. Promised by September is a small, slim, full-screen liquid crystal display. The IIc's carrying case already has a pocket for it. Weighing considerably less than a pound, the LCD has eighty columns and twenty-four rows, as is the case with normal monitors. In fact it will display anything a regular monitor will, even graphics, although fast arcade-type games will leave trails.

With the arrival of its LCD, and the advent of the third-party battery power packs (as well as a device for running the IIc through your car's cigarette lighter), the IIc will be truly portable—and we can forget the ungainly misuse of the word *transportable* in the Apple II world.

A Manner of Speaking. As it did with the Mac, Apple has carefully kept the noncomputerist in mind in putting together the Apple IIc. For instance, if you boot your older II system with the disk drive door open, the disk just spins. The IIc speaks a new dialect. In the same situation, it says, "Check disk drive." And when you're making backups, there's no need to remember which is which—when to run CopyA, when to brun FID, when to run ProDOS's Filer or Convert; you just boot up the System Utilities disk and choose between "Work on Individual Files" and "Work on Entire Disks."

The manuals are totally new. They're entirely in English (even pretty elementary English) and are peppered with boxes telling hackers not to bother reading on, just go get the separate reference manual instead.

IInd to None. The significance of the Apple IIc is easy for Apple II and IIe owners to overlook; of most relevance to us is that the greater the success of the IIc, the more super software there'll be written for it, much of which we'll be able to run on our

IIs and IIe's. More significant in the overall scheme of things is the potential position the IIc gives Apple in the micro market.

Since International Business Machines's release of the PC*jr*, the Apple IIe's sales have boomed. The Apple IIc, coming in at a price comparable to a similarly equipped Junior and light enough for virtually anyone to tote around perfectly comfortably, is almost bound to dominate the higher-end home market (as well as eating into the more serious-minded lower-end). Some business travelers may be tempted to furnish their offices with computers compatible with the one they'd like to carry on the plane.

Then there are those who haven't really considered buying a computer yet. In an informal survey of computerless people, a large percentage, upon seeing the IIc, immediately began planning how and when they could manage to purchase one. Among their comments: "It's the first computer that doesn't look threatening." "It doesn't look like it would take over my house and life." "It's so cute." "I could take it anywhere with me." "I could take it with me instead of my portable typewriter—it's even lighter than my typewriter." "It's just right for the kids." "It doesn't look like a machine." "It fits."

Light, sassy, sweet. Go on, just try to ignore the delicious IIc in your future. ■

Carry On Apple
The IIc Bows in Europe

Fred Bullock, a sharp young Englishman who moved to Paris to join Apple Computer International (see Exec article), is the product marketing manager in Europe for the Apple IIc—which until April 24 was code-named in Europe "Picasso." The handling of the IIc, announced simultaneously in the United States and Europe and introduced to dealers more or less at the same time on both sides of the Atlantic, demonstrates the sometimes complicated preparation needed to introduce a major new product.

Bullock, who has been involved with the European introduction of the IIc since November of last year, says the process of introducing a new product all starts with MRDs (manufacturing requirement documents). An MRD is a report incorporating information gathered from talks with dealers and end user surveys indicating the manufacturing requirements for a product in a particular region.

In Europe, a region which is actually a dozen very different countries with a potentially wide range of specific requirements, the details of the MRD can get quite complicated. In Sweden, for instance, there is considerable pressure from unions to ban sales of computers that do not have detachable keyboards. Likewise there is a push in Germany and Sweden, possibly the two most ergonomically conscious countries in the world, to ban sales of video monitors that do not have amber displays.

The two MRDs from Europe and the U.S. are combined to form a global MRD that is sent to the engineering department, which, in turn, produces an ERS (engineering response). Then there is a "kind of tennis match between the engineering and marketing departments that takes two to three months," says Bullock. Once the volleying is over, a PIP (product introduction plan) is created for both the U.S. and Europe.

The PIP defines the product and its market. The PIP, at least in the case of Europe, details any localization requirements. For instance, in most of the countries in Europe the video display interface must comply with the PAL standard, as opposed to the NCST standard in the States. Keyboards, character PROMS, manuals, and servicing strategies must also be localized. The PIP also defines how the product is going to be promoted in the different areas.

Another important aspect of getting a product ready for market is the seeding of systems to local developers. "One of Apple's main concerns is to maintain system compatibility—between the IIe and IIc—with the II Plus. It's important that the new version of the famous Apple II still run 90 percent of the existing software. But it's also important that there be new software for a new machine."

With this in mind, Apple has seeded eighteen systems throughout Europe with the goal of having localized software ready for the launch of the IIc.

The IIc is an ambitious attempt to enter the high end of the difficult European consumer market. The IIc is seen as having the best opportunity for success when marketed as a personal productivity tool for businesspeople, though its portability means it may double frequently as a home machine.

"As a machine for the European consumer market, we see the IIc as affordable enough for people to buy with their own money; it's also easy to use, easy to carry, and easy to install," says Bullock.

"In America the IIc is squarely aimed at the mass consumer market," Bullock continues. "But in Europe the consumer market is not as developed as it is in the States. Here, people will spend up to $600. There is a big void between $600 and $1,500, and we see the IIc as existing in the middle of that void."

Apple, according to Bullock, sees the IIe and IIc existing side by side in Europe. The main difference between the two IIs is the seven expansion slots on the IIe and the portability of the IIc. The IIe is aimed at education and more demanding business applications, those that require networking or hard disks, while the IIc is aimed at business managers and perhaps clerical staff workers.

"The IIe is not obsolete. We plan to sell as many IIe's in the future as we are selling now," Bullock explains. Even so, the IIc is expected to top off at 65 or 70 percent of Apple's II family sales in Europe within a year or so.

"The IIc has a lot more functionality than the IIe," Bullock continues. "One of the things that Sculley insisted on when he joined Apple was that we continue the Apple tradition of using innovative technology.

"The IIc is a good value for the money. The price of the IIc in Europe will be approximately 6 percent higher than its price in the States. This increase is attributable to the cost of importing parts and the freight charges for those parts. The main computer is manufactured in Ireland, the motherboard comes from Singapore, the monitor is imported from the Far East."

The basic IIc package includes 128K, double hi-res graphics, a built-in disk drive, eighty-column display, two serial ports, the external power supply, a standard adapter for a TV set, and six disks' worth of software.

Apple's strategy is to provide buyers with all they need to get the machine up and running right away. Bullock says it would have been nice to include a mouse, but every extra item would have driven the price up and perhaps turned off potential buyers. The same is true with Apple's streamlined IIc monitor. It is hoped that the TV adapter will meet most buyers' needs until they can afford the additional outlay for a monitor. A liquid crystal display screen should be available later in the year.

Apple Computer International, located in Neuilly-sur-Seine just outside Paris, is Apple's strategic headquarters for all of Europe and handles the introduction of products and setting up of initial marketing strategies and pricing structures. After three months, the individual countries—France, The United Kingdom, Italy, Spain, Portugal, Greece, Sweden, Switzerland, Norway, Denmark, the Netherlands, Turkey, Yugoslavia, West Germany, Belgium, Austria, Finland, Cyprus, Malta, and Israel—take over the responsibilities of managing a product. "They know the individual markets better than we ever could," says Bullock. ■

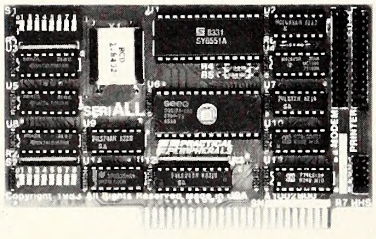
REPORT ON NEW PERIPHERAL HARDWARE:

CHOOSING A SERIAL INTERFACE FOR YOUR APPLE*COMPUTER.

The "Second Serial Hardware Decision"...

Once you've selected the right serial printer or modem for your Apple* system, your hardware decisions are over for a while. Right?

Wrong, of course! You still have to decide on an interface card. This "second serial hardware decision" is an important one—one made much simpler

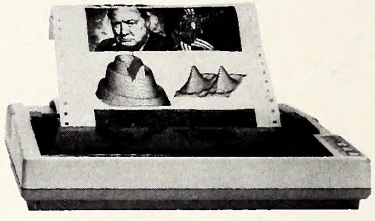


SERIALL Printer/Modem Interface

by SERIALL™, the new serial interface for Apple computers.

At a significantly lower cost than Apple's own serial card —$159.00 vs $195.00—SERIALL gives you a bunch more features. Practical, everyday features, not useless extras.

For one, SERIALL is the only interface that provides graphics capabilities for serial printers including Apple's new dot matrix Imagewriter™.



Graphics capabilities for serial printers

SERIALL also offers 27 easy commands for text formatting and screen dumps, making it the most intelligent serial interface you can use with an Apple.

Equally important, SERIALL gives you complete communications interfacing capability. You can use it for modems or in the special terminal mode for timesharing and talking to other computers.

In fact, SERIALL completely emulates the Apple serial card as a communications interface. No additional software or hardware modification is required.

Finally, consider the quality. SERIALL's five-year warranty is proof that this interface is built to work long and hard. No other serial card is backed by a guarantee like this.

After comparing SERIALL feature-for-feature with other serial interface products, we think you'll agree—SERIALL truly is the Do-It-All serial card for Apple computers.

Available from Practical Peripherals—makers of MICROBUFFER™, PROCLOCK™, PRINTERFACE™, and GRAPHICARD™.

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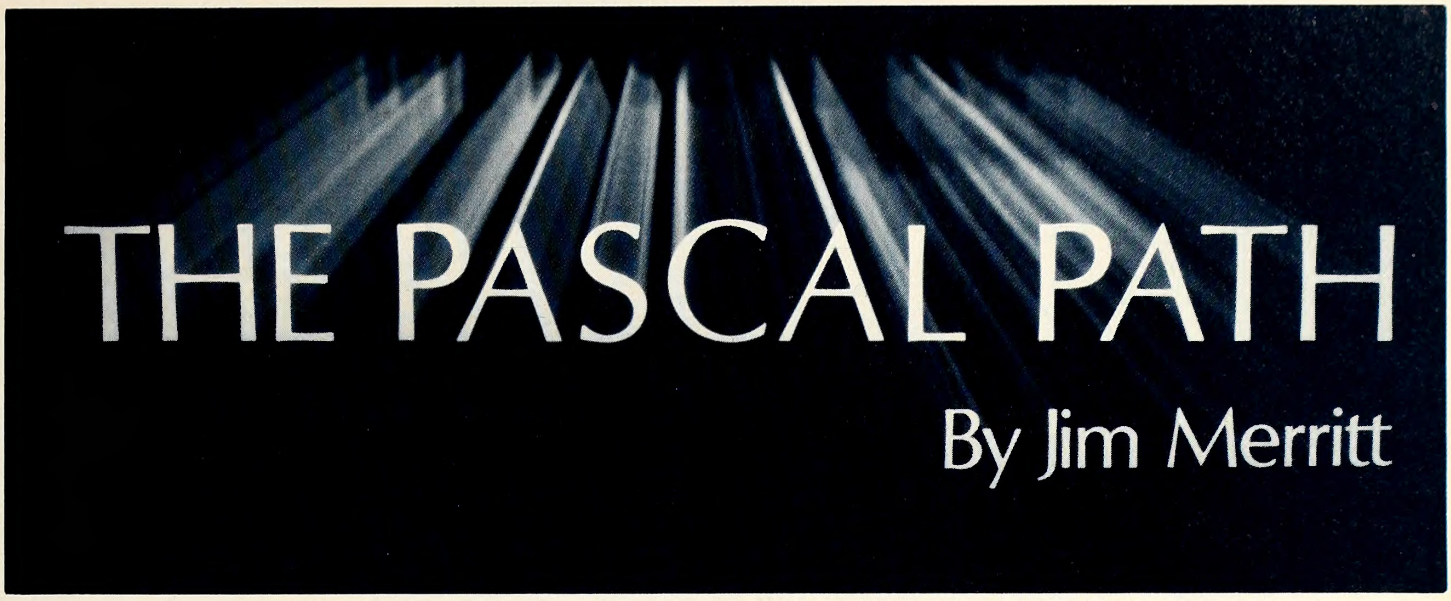

Jungle Fever, Part 14

In Your Letter. An ever-increasing number of your letters have suggested that this column address the advanced concepts of *pointers* and *dynamic data structures*. Indeed, the first requests for information on those topics arrived well over two years ago. Unfortunately, we were covering the most elementary aspects of Pascal at the time; it seemed imprudent then to launch into a discussion of esoteric techniques. After all, we had to learn to walk before we could run. In recent months, however, we have ventured fearlessly down the darker, lonelier stretches of the Pascal Path and have in fact maintained a rapid pace through the thick underbrush of advanced methodology. Thus, there is simply no point in stalling any further.

On the Street of Dreams. Suppose you write a letter to the Pascal Path but have no stamps. You go to the post office and wait your turn at the stamp counter. Eventually, you arrive at the head of the line and approach a window. But just as you get there, the clerk pulls down the shutter, on which is printed the legend "next window please," along with a rightward-pointing arrow. So you move to the next window, just as the clerk there pulls down *his* shutter! And on you go, in a scene straight out of an absurdist nightmare or a television commercial for overnight courier service, following the arrow as it appears in window after window, your frustration building until, finally, you arrive at the only window that remains open in the entire post office. With an evil twinkle in his eye, the clerks asks, "May I help you?" But his offer of assistance comes too late. You have withdrawn into yourself, mumbling and giggling, mad as a hatter, just one more hapless traveler who wandered too far into the philatelic region of . . . the Pointer Zone!

Me and My Arrow. The basic concept of a pointer is as simple to comprehend as the words and arrows painted on the stamp-window shutters in our fictional post office. *Applying* that concept, however, can lead to frustration and confusion not unlike that which you'd experience while playing out our post office scenario.

To a computer scientist, a *pointer* is nothing more than a datum that tells you (or your program) where to find another, more interesting datum. By that definition, our old friend, the array index, may be considered as a pointer (and rightly so). Given an Integer variable—let's call it I—you may certainly treat its value as a datum in its own right, perhaps by assigning it to other variables or by performing arithmetic operations upon it. But you may also use I as an index into an array, in which case it acts as the *address* of another value that interests you. If I contained 23, for instance, then the ARRAY reference A[I] names the same area in memory (and so the same datum) as A[23]. If you change the value in I, then A[I] suddenly refers to a different spot in RAM. In other words, the new value of I "points to" a place (or an object) that is different from the old one.

Integers, Strings, Characters, and many other types of data may be coerced into serving as pointers. But this is generally unnecessary in Pascal (except in the common "special case" of array or matrix indexes), because Pascal provides a special type of variable that serves no purpose other than to point at useful data. The proper name for this class of object is *pointer variable*. When a Pascal programmer speaks of a "pointer," he/she is usually talking about such a variable and not about the computer scientist's generalized notion of a "pointer."

Welcome to My Nightmare. Let's jump right into a tiny program that uses Pascal pointer variables to simulate our postal nightmare:

```
  1  1  1:D   1  (*$S+*) (* Apple III Doesn't need this *)
  2  1  1:D   1  PROGRAM
  3  1  1:D   3    Nightmare;
  4  1  1:D   3  (* Simulate the postal patron's nightmare,
  5  1  1:D   3     as described in the May 1984 installment
  6  1  1:D   3     of Softalk Magazine's Pascal Path.
  7  1  1:D   3  *)
  8  1  1:D   3
  9  1  1:D   3    TYPE
 10  1  1:D   3      WindowList =
 11  1  1:D   3          ^Window;
 12  1  1:D   3
 13  1  1:D   3      Window =
 14  1  1:D   3        RECORD
 15  1  1:D   3          Status
 16  1  1:D   3              :(Closed, Open);
 17  1  1:D   3          Next
 18  1  1:D   3              :WindowList
 19  1  1:D   3        END (* Window *);
 20  1  1:D   3
 21  1  1:D   3    VAR
 22  1  1:D   3      LHead,
 23  1  1:D   3      LTail,
 24  1  1:D   3      LMid
 25  1  1:D   3          :WindowList;
 26  1  1:D   6      I
 27  1  1:D   6          :Integer;
 28  1  1:D   7
 29  1  1:0   0  BEGIN (* Nightmare *)
 30  1  1:0   0    (* Set up the list of windows: *)
 31  1  1:1   0      LHead    := NIL;
 32  1  1:1   5      LTail    := NIL;
 33  1  1:1   8      LMid     := NIL;
 34  1  1:1  11      FOR I    := 1 TO 10 DO
 35  1  1:2  22        BEGIN
 36  1  1:2  22          (* Allocate space for new list
                           node *)
 37  1  1:3  22          New(LMid);
 38  1  1:3  27          IF (I = 10)
 39  1  1:3  30            THEN
 40  1  1:4  32              LMid^.Status := Open
 41  1  1:3  33            ELSE
 42  1  1:4  37              LMid^.Status := Closed;
```

```
 43   1   1:4   40          (* This will become new last
                               node. *)
 44   1   1:3   40            LMid^.Next := NIL;
 45   1   1:3   45
 46   1   1:3   45          IF (LHead = NIL)
 47   1   1:3   48            THEN (* this node is the first
                                    (head) node *)
 48   1   1:4   50              LHead := LMid
 49   1   1:3   50            ELSE (* force old tail node
 50   1   1:3   55                    to point to new tail. *)
 51   1   1:4   55              LTail^.Next := LMid;
 52   1   1:4   60          (* Confirm new tail. *)
 53   1   1:3   60            LTail := LMid;
 54   1   1:2   63        END (* FOR I *);
 55   1   1:2   70
 56   1   1:2   70      (* Now, we are ready to simulate
                           the nightmare. *)
 57   1   1:1   70      WriteLn(Output); (* just to be pretty *)
 58   1   1:1   78      IF (LHead = NIL)
 59   1   1:1   81        THEN
 60   1   1:2   83          WriteLn(Output, 'No windows.')
 61   1   1:1  114        ELSE
 62   1   1:2  116          BEGIN
 63   1   1:3  116            WriteLn(Output, 'Window
                               status:');
 64   1   1:3  150            WriteLn(Output);
 65   1   1:3  158            LMid := LHead;
 66   1   1:3  161            REPEAT
 67   1   1:4  161              IF (LMid^.Status = Open)
 68   1   1:4  165                THEN (* we're done *)
 69   1   1:5  167                  BEGIN
 70   1   1:6  167                    WriteLn(Output,
                                       'May I help you?');
 71   1   1:6  202                    LMid := NIL;
 72   1   1:5  205                  END
 73   1   1:4  205                ELSE (* go on to next
                                         window . . . *)
 74   1   1:5  207                  BEGIN
 75   1   1:6  207                    WriteLn(Output,
 76   1   1:6  207                      'Next Window
                                       Please -->');
 77   1   1:6  249                    LMid :=
                                       LMid^.Next;
 78   1   1:5  253                  END;
 79   1   1:3  253              UNTIL (LMid = NIL);
 80   1   1:2  258          END;
 81   1   1:0  258    END   (* Nightmare *).
```

Remember, the shaded portion of the listing is *not* part of the source text and should *not* be included in your copy of the *Nightmare* program. We will use the *line numbers* in the far left-hand column, however, in order to locate crucial sections of *Nightmare* as they become germane to our discussion.

In lines 10 and 11, we define a data type, WindowList, as a pointer to values of another data type, Window. Figure 1 repeats March's syntax diagram for a data type descriptor; the path that describes a "pointer type" is shaded to make it more conspicuous. Just so there is no misunderstanding, you should take a moment to convince yourself that the definition of WindowList agrees with the syntax described by figure 1.

The caret in the type descriptor associated with WindowList indicates that any variable of type WindowList will be a pointer. Following the caret is an identifier, Window, which indicates the *object type*—that is, the type of data to which a WindowList variable may point. When reading program listings aloud (or even to yourself), the caret symbol that *precedes* an object-type identifier should be pronounced as "pointer to." Thus, ^Window should be read as "pointer to Window."

You Got Me Going in Circles. At this point (sorry), the careful reader will begin to smell a rat. "We haven't defined Window yet," you will shout, in tones of righteous indignation. Quite so. Indeed, Window is defined immediately *after* WindowList (in lines 13 through 19). The compiler accepts these declarations in the order given, in clear violation of one of Pascal's fundamental tenets (shout it out loud!): "No identifier shall be used before it has been declared." It so happens that the compiler's design permits it to ignore this rule in the special case of pointer definitions. That is, object-type identifiers may be used in pointer-type definitions before being declared. To see why this situation is desirable (and usually *necessary*), we must examine the declaration of Window.

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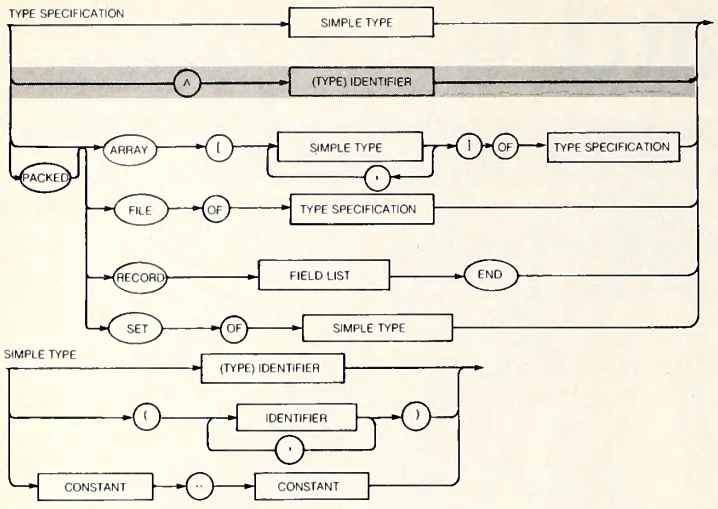

Figure 1. Type specification.

A Window variable is a RECORD of two fields: Status, which tells whether or not the simulated Window is Open or Closed; and Next, which points to the next Window in line (if any). Because it is a pointer to a Window, the Next field is rightly declared as being of type WindowList.

Since WindowList and Window are defined in terms of each other, and one of them *must* be defined before the other, it is clear that the Pascal compiler must take the existence of the second object "on faith," temporarily, in order to process the declaration of the first. The compiler is able to do this, so long as the definition of the pointer type *precedes* that of the object type. In other words, we may define WindowList before Window, but not the other way around.

What's Going On? When you define a data type in Pascal, the compiler automatically determines the proper amount of RAM storage space for a variable of that type. If a variable is defined in terms of an unknown (undeclared) data type, the compiler has no way of knowing how big the variable should be. Without that information, it cannot generate proper object code. Suppose we tried to define Window before WindowList. The compiler would have *no inkling whatsoever* of the nature of the Next field, and would therefore complain of error number 104 ("Undeclared identifier").

We may define WindowList before Window because it happens that all pointer variables have the exact same size and structure at the level of the p-machine. There is no structural difference between, say, a *pointer* to an Integer and a *pointer* to a Window, even though the structure of a Window itself is decidedly different from that of an Integer. (Even so, the compiler prohibits you from swapping values between pointer variables of different types. Thus, if IP has been declared as ^Integer, and LHead has been declared as WindowList, the assignment "LHead :=IP" would be rejected by the compiler, because the two pointers are not of the "same type.")

All Apple Pascal pointer variables occupy the same amount of space. Therefore, the mere fact that a variable is a pointer allows the compiler to decide its size. The caret in the pointer type descriptor provides the compiler with this crucial information. From a practical standpoint, the identifier that follows the caret is of no importance whatsoever in determining the size and structure of a pointer variable.

The Pointers, Performing in Concert. Suppose that you compile and execute *Nightmare*. Figure 2a shows the state of the program's three WindowList variables, just as control passes to the FOR loop that begins at line 34.

The keyword NIL stands for a special value that may be assigned to any pointer variable. If a pointer contains the NIL value, it is assumed to "point at" nothing. You might say that NIL is to pointers what 0 is to Integers, 0.0 is to Reals, and the null string is to Strings. It happens to be a convenient initial value for our three WindowList variables, hence the assignments in lines 31 through 33. So, just before execution of the FOR loop, all the WindowList variables contain NIL.

The FOR loop builds the list of Windows, such that all but the last are Closed. The first statement in the loop body (at line 37) is a call to the standard procedure New. Here, New reserves within vacant RAM the space necessary to hold a single Window, then deposits a pointer to that space into LMid. In general, New creates a new variable of the object type implied by its argument, then fills the argument with a pointer to the region of memory occupied by the new variable.

After the execution of the statement in line 37, LMid points to a newly created Window variable. That is, LMid is the value of a *pointer* to the new Window. The Window value itself is denoted by LMid^.

In lines 38 through 44, we initialize the fields of the new variable. LMid^.Status is set Open (in Line 40) only if we are dealing with the last window in the chain of ten. Otherwise, this field is set Closed (in line 42). LMid^.Next is always set NIL, since the most recently created Window is always placed at the end of the line, and therefore has no successor at which to point!

If LHead is NIL by the time control passes to the IF clause in line 46, then the list is empty, which means that we have just created the very first Window. Consequently, we create a *duplicate* pointer to this particular Window and place it in LHead. (This occurs at line 48.) Henceforth, LHead will always point to the very first Window in the list.

For each new Window after the first, we force the Next field of the last Window in the chain to point to the new Window. That is, we overwrite the NIL value that was previously in the Next field with a value that points to the new Window. As LTail is always supposed to point to the very last Window in line, we must update the pointer value in LTail whenever we add a new Window to the end. This is accomplished by the assignment statement in source line 52.

For graphic summaries of the results produced by the process we have just examined, you should refer to figures 2b and 2c. The former shows the values contained by *Nightmare*'s pointer variables, just prior to the second iteration of the FOR loop, while the latter illustrates the content of the same variables immediately before the sixth iteration.

Just a Case of Mistaken Identity. Before we proceed, you should be sure that you understand the difference between the values LMid (without caret) and LMid^ (with caret). LMid holds a *pointer* to a variable of type Window, but it is not itself a Window variable. Thus, the compiler rejects expressions such as LMid.Status and LMid.Next (without the caret); a WindowList variable such as LMid is a *pointer*, not a RECORD. In contrast, LMid^ refers to the Window variable pointed to by LMid. The expression LMid^.Status names an actual RECORD field

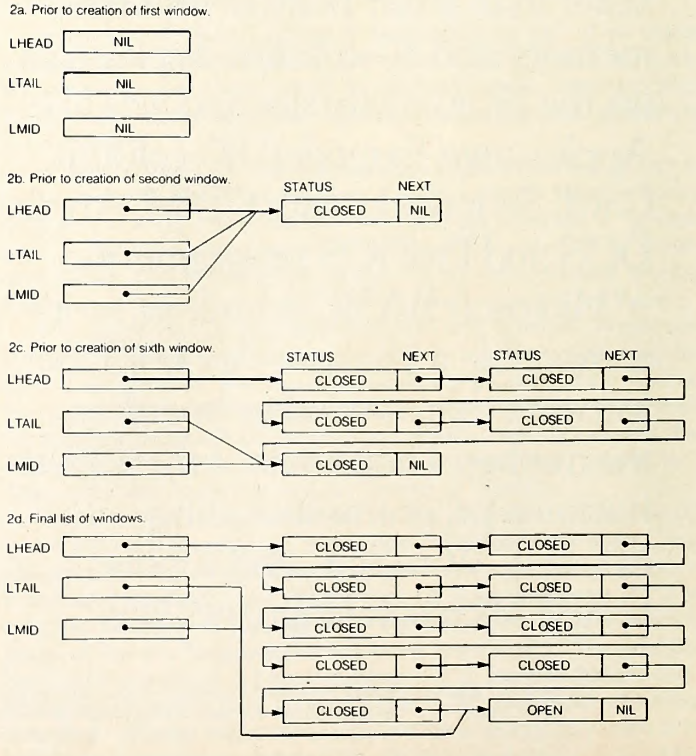

Figure 2. Evolution of linked list during execution of *Nightmare* program.

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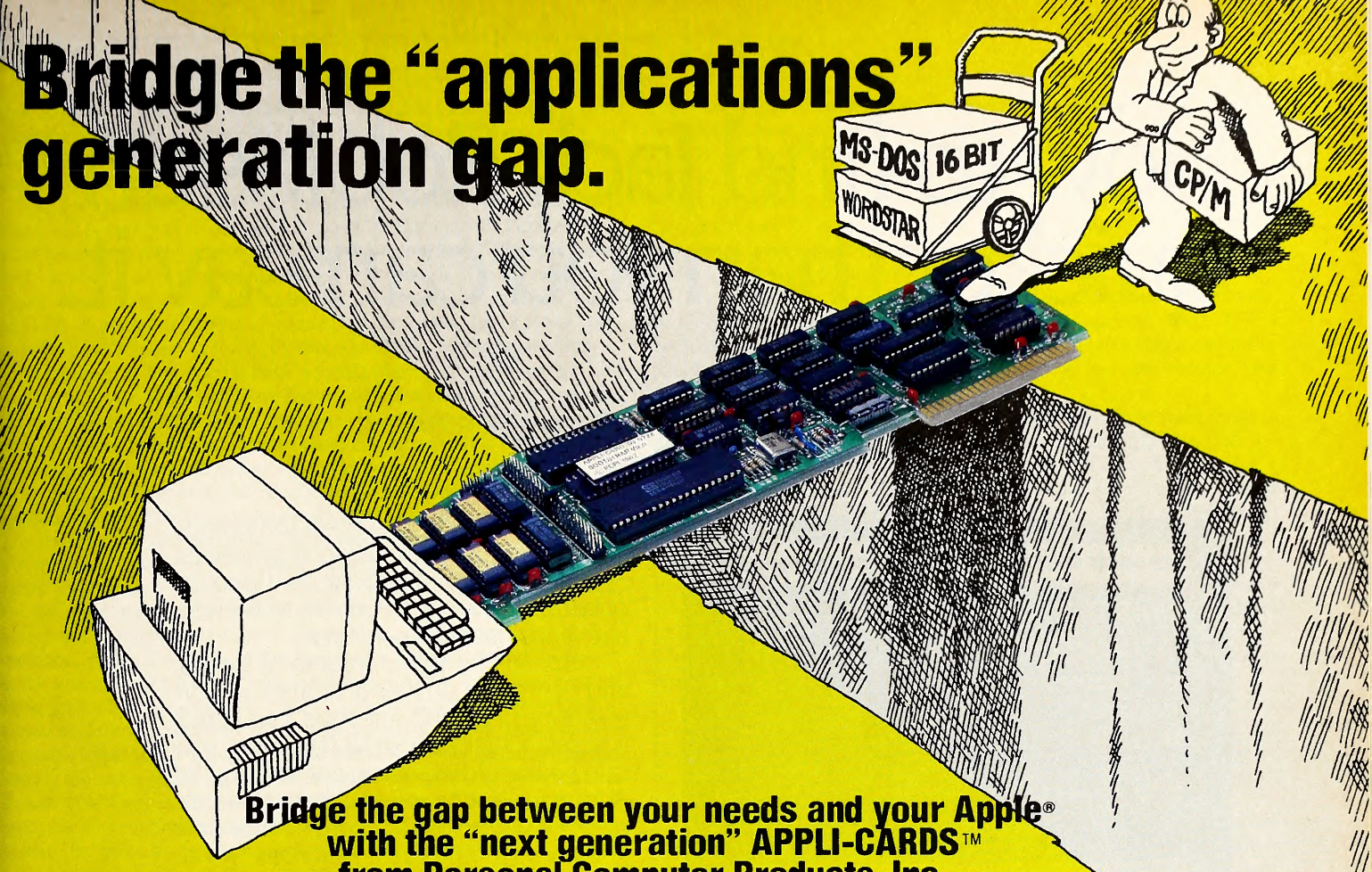

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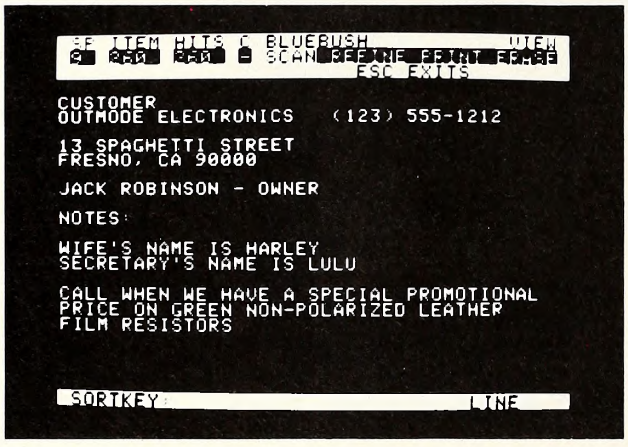

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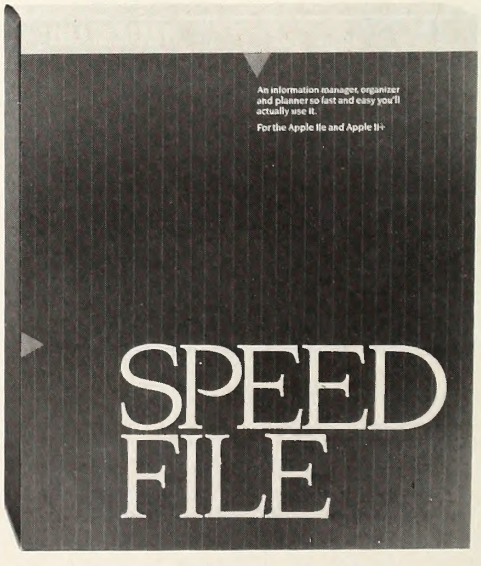

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that can contain either the value Open or the value Closed. LMid∧.Next names a pointer to another Window variable. Note that whenever the pointer LMid contains the value NIL, the object LMid∧ *does not exist*, and the expression LMid∧ is therefore meaningless.

All for One and One for All. Frequently, two different pointer variables will point at the same object in memory. For instance, immediately after the first Window has been created, both LMid and LHead point to that variable. The assignment "LHead := LMid" in line 48 only puts a duplicate of the *pointer* value LMid into LHead! The Window at which LMid points—that is, LMid∧—remains *undisturbed*. An example from everyday life may serve to clarify this somewhat confusing situation.

Suppose that you open a bank account and receive a magnetic card that permits you to deposit funds into or withdraw them from the account through an automated teller machine. Now suppose you marry (or already *are* married). You decide that your spouse should have access to the account, too, and so you apply to the bank for a duplicate magnetic card. When the bank issues the duplicate card, it does *not* establish a new account for your spouse, nor does it alter the balance in the joint account. The existence of two automated teller cards simply means that two different people may access the same account, independently of one another. Each card is a "pointer," if you will, to the single joint account. By the same token, at the end of the first FOR loop iteration in *Nightmare*, the variables LMid and LHead both point to the same area in memory. Thus, if we placed the assignment "LMid∧.Status :=Open" at the end of the loop body (between line 53 and 54, say), then both the relations "(LHead∧.Status= Open)" and "(LMid∧.Status= Open)" would be True, immediately prior to the second iteration. This would be because LMid∧ and LHead∧ would name the exact same object (not merely the same value). At the risk of confusing matters even further, we should note that, at the end of the first iteration of *Nightmare*'s FOR loop, the three pointer variables (namely, LHead, LTail, and LMid) *all* contain the same pointer value, and so point at the same object in memory. This situation changes with the second iteration, of course, and never occurs again. (Do you understand why? If not, careful study of the *Nightmare* listing should help you to grasp the concept.)

Workin' on the Chain Gang. Figure 2d shows the final state of the pointer variables and the list of Windows, just before the execution of the WriteLn statement in line 57. By this time, LMid and LTail both point to the final Window in the chain, while LHead still points to the first.

Lines 56 through 80 of the *Nightmare* program are concerned with displaying the chain of Windows established by the preceding FOR loop. Obviously, if LHead contains NIL (which it certainly should *not*, if the FOR loop functioned correctly), then there is no first Window. In other words, if LHead contains NIL, the list of windows pointed to by LHead *must* be empty. Should this be the case, *Nightmare* produces an appropriate message on the screen, and then terminates. Otherwise, the status of each Window in the chain is displayed, in proper order.

A computer scientist would call our chain of Windows a *linked list*. In the jargon of computer science, the REPEAT loop of lines 65 through 79 *traverses* the linked list. The loop begins at the first Window in the list and follows the Next pointers from Window to Window, reporting the Status for each, until an Open window is found.

For the display loop, LMid is employed as a pointer to the Window of interest at any instant in time. It is set initially to the value in LHead (line 65). So long as LMid∧.Status is Closed, LMid (the pointer) acquires a value that points to the next window in line, by virtue of the assignment "LMid := LMid∧.Next" in source line 77. *This assignment statement is the key to list traversal*, so go over it in your mind until it makes sense to you. You will be seeing many more similar statements in programs that we will develop soon.

Notice that the formal termination condition for the REPEAT loop—as stated by the UNTIL clause—is "(LMid= NIL)." However, the *logical* termination condition is "(LMid∧.Status= Open)." That is, we would really rather stop traversing the list as soon as we find an Open window, rather than continue on to the end of the list (which is indicated by a NIL value of LMid∧.Next).

In the contrived world of our *Nightmare*, we could just as easily have put the logical termination condition into the UNTIL clause, either in addition to, or as replacement for the one we actually used. Since the last Window in the list is guaranteed by the FOR loop to have both a NIL value for Next *and* a Status of Open, we could have used either or both of the termination conditions, with equal success. But what if we had decided the value of each Window's Status on a *random* basis? Then, it would have been possible for any and all of the Windows to be Open (or Closed!). Suppose that we had chosen Status values at random, and that they *all* happened to be Closed. Had our termination condition been "(LMid∧.Status= Open)," it would have been impossible, under these circumstances, for the loop to terminate at all! Eventually, LMid would have acquired the value NIL, thereby invalidating the expression LMid∧.Status altogether.

The expression "(LMid= NIL)" is valid for *all* values of LMid and so makes for a "bulletproof" loop termination condition. The IF-THEN code of lines 67 through 72—especially the assignment statement in line 71—insures that the actual termination condition will also become True whenever the logical one does.

You might wonder why we didn't just state the loop termination condition as "((LMid= NIL) OR (LMid∧.Status= Open))." Such an expression would certainly cover all the bases, but it is unsuitable as a termination condition, because in Pascal all Boolean expressions are evaluated *completely*. For this particular example, Pascal would always evaluate both subexpressions, "(LMid= NIL)" *and* "(LMid∧.Status= Open)," before combining their values with the OR operation. Unfortunately, whenever LMid contains NIL, there is *no such thing* as LMid∧.Status! The hypothetical "all-inclusive" termination condition contains a built-in paradox that is avoided by the somewhat more obscure, but definitely more reliable code that is actually used in *Nightmare*.

On and On. . . . As you can well imagine, the *Nightmare* program is only a small tidbit, intended to whet your appetite to learn more about pointers. By now, you should be asking many questions, including: (1) Where does Pascal's New procedure get the memory that it allocates?; (2) Why bother to use pointers at all?

While it is impossible to cover this rich topic thoroughly in just a few magazine pages, we'll nevertheless try to do just that in next month's *Softalk*. Be here in thirty days, when we'll learn that pointing at someone first may help you to more efficiently reach out and touch him/her! ■

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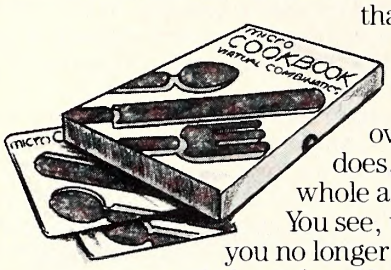

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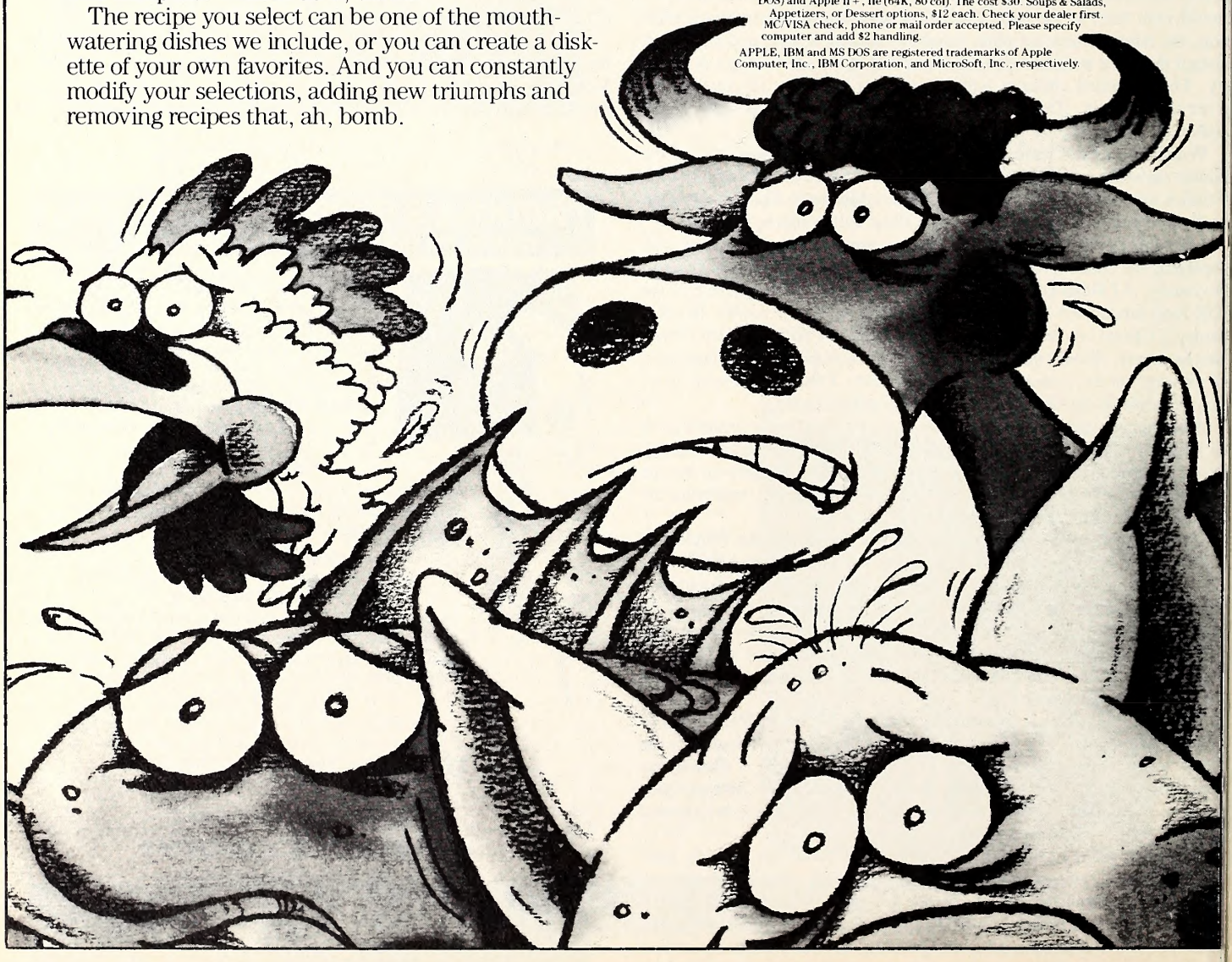

BEGINNERS' CORNER

BY MATTHEW YUEN

Graduation Day

Since this is the last class meeting, and since we're all anxious to start our summer vacations early, we'll keep things nice and short.

But before we go tromping off to our respective summer resorts, let's take a look at an area that's often neglected—computers in education.

Kids Are People, Too. Microcomputers are usually referred to as personal computers and home computers. Images of someone taking care of home finances or office work come to mind when we hear such terms.

Computers fall naturally into number-related functions such as statistics, accounting, and calculating.

While education is an area of computing that is often considered secondary, computers can also function as teachers and teachers' aides, both at home and at school.

Before the introduction of microcomputers, very few schools had computers; and the computers they did have were rickety old machines that printed everything on paper instead of to a video screen. Computers in schools were used for teaching about computers. Older kids would learn Basic, write simple programs, and feel like geniuses. But when microcomputers entered the scene, they made computing faster and easier. It wasn't too long before someone got a bright idea. It's said to have happened like this:

Idea person: Know what I think?

Other person: No, what?

Idea person: I think it would be great to have microcomputers in elementary and junior high schools.

Other person: Why? Kids can learn computing when they get to high school.

Idea person: Yeah, but I'll bet teachers could use computers to help teach kids all kinds of stuff.

Other person: To teach what?

Idea person: All kinds of stuff!

Other person: Oh.

Well, maybe not just like that. The idea of using computers as educational tools is based on other ideas such as computers can be fun, learning should be fun, and computers are patient. Add up those ideas and the sum is that computers are patient "teachers" that can make learning fun.

Of course, the computer doesn't know it's patient; it just doesn't know how to be frustrated. Also, computers demand interaction. They respond to people, but only if they receive input. Response gives students the feeling they're receiving attention.

If young people become comfortable with computers at an early age, they may have better success in jobs later in life. As idealistic as that sounds, consider this: How many of us were given the opportunity to use typewriters, adding machines, industrial machinery, dental drills, columnar pads, and other work-related tools so early in life?

There's educational software to teach almost any subject from shape and color recognition to organic chemistry. And not all software is for school use; many programs are designed for preschoolers to use in the home. One popular program that used to be included with the purchase of an Apple was *Lemonade Stand* (now a cult classic). It's fun to play, and it has the latent function of teaching players some elementary business economics.

Teachers Are People, Too. Not everyone agrees that the computer is the best teaching aide. Though there can be little doubt that exposure to computers helps kids learn about the machines, some educators feel there is no substitution for human interaction. A computer can present material but it can't offer vocal reinforcement, a pat on the back, or even a smile. And then there's software.

Few programmers are good teachers, and few teachers are good programmers. One of the problems with introducing computers into schools is that sometimes teachers know as little about computers as their students. Much educational software is available, but its quality is questionable. There's bad software in all areas of computing, noticeably in education. Also, prices are often comparable to other kinds of software, and schools don't have the money.

Another problem is that most microcomputers have 64K or less in RAM, which puts a limit on what software programmers can develop. Just how many chapters can be crammed onto one disk?

Computers as part of education in the classroom and at home are becoming more common; to kids, the computer is another new tool, just like books, pencils, crayons, and chalk and chalkboards. As they learn the subjects that computer programs teach, they learn to accept computers as part of life.

Look How Far We've Come. Not long ago computers were things of science fiction movies. Then they became bureaucratic monsters that made life miserable for us at bill-paying time. And then they were machines that other people had and we were scared to touch.

Computers put everyone on the same level as little kids; when you're a kid, everything is new. The environment is for exploring. It was fun to watch people at computer shows and stores walk up to an unattended machine and think about whether they should touch it or not, and if they touched it, what it would do. Wonder and discovery were part of the fun and the magic.

Then computers became available to consumers; first it was consumers with lots of money, then it was consumers with almost lots of money, and now it's consumers who wish they had lots of money but don't—nonetheless, they have enough for a home computer.

Computers entered the home, and we discovered that there was little to fear. We control them, not the other way around. They have switches telling them whether they're on or off, which only we humans can control. Computers are tools like the calculator, clothes iron, blender, food processor, and automobile; they're not uncontrollable machines like robots on *The Twilight Zone*.

About the same time we discovered computers we found out what software is and how it makes our interaction with computers easier. The computer follows instructions given to it by

people. If we can't speak the computer's language in order to communicate with it, there are creatures called programmers who can. Programmers create software that makes it easy for us to use the computer. This computer craze just keeps getting better all the time, doesn't it?

In this section of *Softalk* we've covered how to run commercial software. We've learned what to do if things go wrong and how to reduce the chances of similar disasters in the future. We've taken the lid off the Apple and found out what most of those chips are for, and we've looked at how things are structured inside the chips. Just as important, we took all those words computer people like to use (and misuse) and found out what they mean.

With this foundation of computer knowledge, we can either use it to help us work more at ease with computers or we can build upon it. For those who wish to go on and learn programming, more power to you. For everyone, even those who are comfortable booting and using software and will never even think about writing a line of Basic, there's still more to consider. Fortunately, it's nontechnical.

You Say You Want a Revolution? A few years ago, people started talking about a computer revolution. "Dig in; it's coming," they said. Actually, it was already happening, and it's still happening. Almost everything we read in the news about computers mentions how rapidly prices are dropping, how computers are becoming more common in schools and in homes, and how they will affect our lives.

Books like *Megatrends*, *The Third Wave*, and *Future Shock* are fascinating works that examine the future. They're fascinating because they examine a future most of us won't be around to see. Let's concern ourselves with the immediate future.

Home computers have already affected our lives; besides having reduced the size of our bank accounts, they've changed the way we think. While some people at the office reach for a spreadsheet program or word processor when work needs to be done, others come home from work or school and boot up their favorite games. Both groups of people are likely to wonder, "How did I ever get along without my Apple?"

As we said many months ago, computers don't let us do things that weren't possible before; they just let us do them faster and easier. Before *VisiCalc* and *Multiplan* there were the green worksheets; before *Wizardry* there was the board version of *Dungeons & Dragons*; before *Apple Writer* there were pencils, pens, and typewriters. That's how we got along without our Apples.

So now we have computers, and we're using them. And because they help us do so many things more efficiently, it's easy to forget the first thing we learned about computing—we are the ones in charge. The way people in southern California have become slaves to their cars, some computer owners have likewise become dependent on their machines. You know the type; no matter how easy it is to pick up a personal phone directory and find Uncle Stephen's number, they'll spend several minutes booting a phone list database, looking for the right data disk, and searching for the number.

There's also the infamous computerized Christmas card list. All you have to do to print mailing labels for your holiday greeting cards is press a key. Presto! In minutes, everybody's name and address is on a label in beautiful dot-matrix (or even letter-quality!) computer print. Just imagine how touched the recipient will be to receive such a personalized card.

Rehumanize Ourselves. The point is that some things are done better the old way: Thank-you notes to Mom and Dad are more effective if they don't look like computerized junk mail; balancing the checkbook is often easier by pencil and paper if you don't write a lot of checks; sometimes even business letters look better when they're typed on a good-quality typewriter than if they're computer-generated; it's more fun to play checkers against a person than against the Apple—computers don't "take back" moves, which makes it harder to provoke an argument. Apples are powerful tools, but just because they're there doesn't mean we have to use them all the time.

Ask this: "Why did I get a computer in the first place?" Certainly the answer can't be "So I could sit in front of a keyboard and screen looking like a confused fool." Nope. It probably had something to do with any of three things: to make some tasks easier, to use as an educational tool for the kids, to give you the power of a computer in the home or office. For whatever reason, it was an expensive investment, which makes us feel obligated to use the machine as often as possible.

Try to think of the computer in a different way; think of it as we've often referred to it—as a tool or a convenience. It's less troublesome to pull the occasional weed or two instead of hiring a gardener for the job. It's easier to scramble a few eggs with a fork than to haul out the Mixmaster. It's faster to walk next door for that cup of sugar than to start up the car and drive. (By the way, has anybody ever really borrowed a cup of sugar from next door?)

As versatile as the computer is, it isn't for everything. But it could be.

Sure, it's easier to write "lunch with the boss on Wednesday" on a scrap of paper than it is to boot *Micro Paper Scraps* and make a computer entry; however, scraps of paper can become lost and are sometimes forgotten. But just because it's a hassle to use the computer for certain tasks doesn't mean it will always be that way.

If we think of the computer as a tool, it becomes obvious that, like other tools, the computer will go through refinement over and over again, possibly forever. Look at televisions; every year they get fancier, providing more conveniences than before. (There's an anecdote about a man who remarked that when televisions first came out they had screens that were only a few inches wide. Referring to today's pocket-size televisions, he said, "It amazes me how it took us thirty years to get them that small again.")

Computers and Rolled-Up Newspapers. Refining the computer is like training pets to do tricks. Just as the Apple II hasn't the faintest idea what you mean when you type, "Hello, what's your name?", a month-old puppy doesn't know what you mean when you give the command, "Sit!" To teach the puppy to sit, we usually give the command while trying to push its rear end to the ground. Heaven knows what the puppy is thinking when some big two-legged animal is playing games with the puppy's rear end, but it eventually learns to associate the word *sit* with planting its bottom to the ground. Likewise, the computer was "taught" by programmers to display a disk's contents when someone types *catalog*.

As the puppy grows up and becomes a dog, we can teach it more sophisticated tricks like shaking hands, rolling over, jumping up and down like an idiot, and fetching Frisbees. Not all dogs have what it takes to learn and perform complicated tricks, and not all computers are equally intelligent; they depend on their creators and the software's programmer to "teach" them to do sophisticated tricks.

Computers are getting more intelligent all the time, but they're still far from being powerful enough to dominate us. It would be nice to be able to type *Give me the current value of the English pound* and have the computer understand you, dial up an information service, find out the value of the pound, and report back to you. It would be even nicer to be able to just say the words and have the computer understand your voice and carry out the command. Someday it might.

In Beginners' Corner, we learned only the basics about a lot of things. For those who wish to learn more about programming and tinkering, there are many other magazines and books that cover such areas. There are even how-to books that cover specific programs like *dBase II*, *VisiCalc*, *WordStar*, and *Apple Writer*. It's ironic that we buy computers to make our work easier, only to find that we need books and tutorials to make using the computer and its programs easier.

It's Okay To Be Human, Too. Don't feel bad if the urge to learn the sophisticated art of programming doesn't hit you; it's a hobby and occupation to some, but it's not necessary for everyone who wants to use a computer. Years ago, you had to have at least a moderately technical background to work with a computer. Later, all you had to know were a few computer commands and how to type. With Apple's Lisa and Macintosh all you have to know how to do is point and click; with Hewlett-Packard's HP 150 microcomputer, issuing commands has been replaced by touching the screen.

Computer engineers make their living by making machines easier for people to use. A lot of us used to feel uneasy around computers because we didn't understand them; some still don't. The way computers are developing, soon there may not be a lot to understand in order to get our work done.

Technically oriented people will always be around. For the rest of us, the day will come when the computer evolves as the radio and automobile did. Just switch it on and go. Confusing and complicated as they can be, computers are providing us with a wealth of stories to tell the grandchildren ("Why, in those days we had to actually *memorize* DOS commands!").

In the meantime, have fun. These are the good ol' days. ■

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TRADETALK

LODE RUNNER, WIZARDRY MINE GOLD ON APPLE II

It's *1-2-3* for I-B-M and *Catalyst* for III; Archon, *Star Raiders* Take Atari

Top left: Accepting *St.Game*'s 1983 Atari award for *Archon* are authors Jon Freeman, Anne Westfall, and Paul Reiche III, along with producer Joe Ybarra. Center: Jim Willis, district manager of Lotus Development, accepts *Softalk for the IBM Personal Computer*'s 1983 award for *1-2-3* by Mitch Kapor. Right: Two guys named Doug—publisher Carlston, left, and programmer Smith—admire *St.Game* and *Softalk* awards for Broderbund's *Lode Runner*.

☐ At this year's Ninth West Coast Computer Faire, held March 22-25 in San Francisco, there were an awful lot of booksellers, some very mediocre food, and little technical razzle-dazzle. And those are about the only conclusions everyone agreed on after this year's four-day extravaganza in Baghdad by the Bay.

This year, fair ownership and management passed from founder **Jim Warren** (engineer, editor, and all-around New Age spirit) to **Computer Faire Inc.**, a wholly owned subsidiary of publishing giant Prentice-Hall—which may partially explain the preponderance of printed matter at the event. The big corporation association may also have had something to do with fewer mom-and-pop operations and a fading of family feeling as compared to past years.

Many veteran fair-watchers at least feigned disillusionment. They shook their heads, saying that it just wasn't the same homegrown hobbyist haven that it used to be—last year, two years ago, or eight years ago. Too few software publishers, they said; too many retailers; too many computer illiterates crowding the aisles; and enough cash registers clinking to make the whole place seem like one giant electronic flea market. But somewhere among the hucksterism and PR, the cables and the floppy disks, the pioneering spirit (due primarily to MacMania) remained. Even those who affected a world-weary attitude were there to talk about it.

There was, after all, something for everybody. Conferences for independent sales organizations, educational forums, technical seminars, user groups, lectures by industry heavyweights, hands-on lessons in Macintosh and PC*jr* usage, Softalk Publishing's software awards ceremony (more on that later), and even an organization called Computer Scientists for

Top: Left to right, Robert Woodhead and Andrew Greenberg, who conjured up the multiple-award-winning *Wizardry* for Sir-tech, and Fred Sirotek, president. Below left: Fred Simon, senior vice president of computer marketing, picks up *St.Game* plaque for Atari all-time fave rave *Star Raiders*. Below right: Quark Engineering outside sales manager Keith Wood takes the *Softalk* Apple III 1983 award for *Catalyst*, written by Tim Gill. Bottom: It was standing room only at the Softalk Publishing awards ceremony at the West Coast Computer Faire in San Francisco's Civic Auditorium.

Social Responsibility (an antinuke group). Hardware for sale, software for sale, balloons, buttons, posters, and little Apple mouse pins.

Some people were having a fine old time. Mac magicians **Andy Hertzfeld** and **Burrell Smith**, enjoying well-deserved accolades from the Macfaithful, thought the grassroots spirit of the fair was reborn in Mac and the upcoming products for it. **Apple** itself, with its eleven-foot-high scale model of Macintosh at the front of Brooks Hall, was easily the show's biggest attention-getter. This could not have gone unnoticed by **IBM**, whose neighboring booth had a similar number of workstations (about twenty) and respectable attendance. For next year, Big Blue has reserved a spot in the next-floor Civic Auditorium.

It was true that several major talents were conspicuous by their absence. **Sierra On-Line**, **Infocom**, and **Adventure International** were nowhere to be found. On the other hand, **Penguins** were there in flocks and garnering good notices for the Mac version of their adventure *Transylvania*. And **Sir-tech** previewed the work-in-progress Macintosh version of *Wizardry*.

Some companies evidently felt that the (considerable) cost of a booth was worth it in order to connect one on one with the end user. Others, such as **Origin Systems**, chose to attend as individuals, adopting a low profile to keep up with industry trends, check out the competition, make contacts, and visit with friends not seen since the last show.

Finding a middle path was **Broderbund Software**, which took a hospitality suite close to the show site to demonstrate its just-about-ready *Print Shop*, a super-looking Apple package for designing greeting cards, fliers, and banners using a wide range of choices of

graphics and text.

Debuting on the Apple II front was *SunDog*, an animated graphic adventure from Faster Than Light Games, part of **Oasis Systems** of San Diego. The space-traveling players visit fifty-seven cities on eighteen worlds in this joystick-controlled trading game. The cover art alone is so impressive that it had the publishers wondering aloud why they hadn't printed it up as a poster.

Equally as pretty for Apple III fans was *Draw On III*, from **On Three** of Ventura, California, a graphics tool that—at first glance, at least—looks to do as much as *MousePaint* or *MacPaint* on the III's siblings.

Other products notable and noted: a soon-to-be-out hardware-software combination telephone and program from **Artsci**; a program from **Pterodactyl** that compiles IBM PC Basic to run on the Lisa; a Lisa desktop calendar from **Videx**, out in the fall; MacForth, by **Creative Solutions**, precisely what its name implies; *Rails West!*, a nineteenth-century business strategy game from **Strategic Simulations**; **Rana Systems**'s dual drive that can run IBM software on an Apple; **TNW Corporation**'s intelligent modem; and Apple's gift booth, which sold something like $1,500 worth of T-shirts and other goodies the first day alone.

Spotted in the crowd: **Bill Budge** (*Pinball Construction Set*), who at six-foot-plus is hard to miss; exactly one mime, perhaps a holdover from nearby Marin County's autumn Renaissance Faire; and **Robin Williams**, in one of his lesser-known roles as an Apple IIe owner.

As usual, the after-hours revelry was the best atmosphere in which to win friends, influence people, and seek a consensus of perception on the microcomputer industry's future. As last year, **Microsoft** threw an almost too self-consciously upper-crust party in the 1920s baroque-style Flood Mansion. There, high-tech shoptalk clashed with old-world elegance; longhairs in flannel-and-denim hackers' standard issue sipped white wine and scarfed down oysters alongside executives in three-piece pinstripes while listening to a jazz trio.

Softalk Publishing put on its Fourth Most Popular Software Poll Awards ceremony Saturday evening to present plaques to overall first-place winners in the 1983 and all-time categories. *St. Game* editor Andrew Christie presented awards for Atari programs. Winning for 1983 was **Electronic Arts**'s strategy game *Archon*, accepted by authors **Jon Freeman**, **Anne Westfall**, and **Paul Reiche III**. Said Freeman in his acceptance speech, "Those of you who like *Archon* should probably find something interesting coming out in about two months." *Star Raiders* took all-time honors, as it did last year. The award was accepted by **Atari**'s **Fred Simon**, who said, "After what we've been through in 1983, this is a pleasant surprise."

St. Game associate editor Matthew Yuen handed out the equivalent Apple awards. Broderbund's *Lode Runner* was 1983's champ; the plaques were accepted by programmer **Doug Smith** and publisher **Doug Carlston**. Smith said later that he's been home in Seattle working on another game that will soon be released—"I've got lots of wall space for plaques." The all-time choice was Sir-tech's *Wizardry*, penned by **Robert Woodhead** and **Andrew Greenberg**. Again. Joshed Woodhead: "In the interest of being brief, I think we deserved it totally." Greenberg's two bits: "I never thought I'd stand up here again before you, with Robert, and still be smiling." Briefly serious, Sir-tech president **Fred Sirotek** noted that *Wizardry* is being translated into foreign languages and has been used to talk kids out of suicide, to evaluate prisoners, and to aid college students with their coursework. "Time will tell whether it will be a classic," he said. "Anyhow, it already has one up on the Mona Lisa—it has been copied more often."

Craig Stinson, editor of *Softalk for the IBM Personal Computer*, presented a single award for 1983 to the landslide winner—**Mitch Kapor**'s *1-2-3*. It was accepted by district manager **Jim Willis** of **Lotus Development**. *Softalk*'s publisher Al Tommervik, an inveterate Apple III fan, gave the Apple III award to **Quark Engineering**'s **Tim Gill** for his *Catalyst*, which lets the user put applications on hard disk. Softalk president and editor-in-chief Margot Comstock Tommervik presented the *Softalk* Apple awards. *Lode Runner* snatched the year's prize, while—what else?—*Wizardry* came away with the overall honors.

By the fair's end, 44,850 people (officially—a larger number of programs and badges distributed suggests that an extra five thousand may have entered by unkosher means; two people have been arrested on suspicion of ticket

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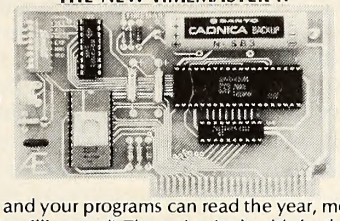

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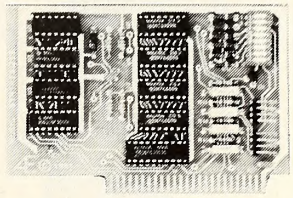

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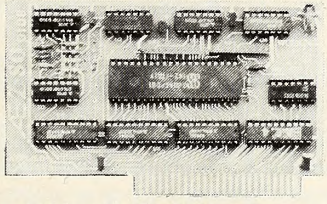

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SUP'RTERM	MORE	NO	YES	NO	NO	NO	NO	YES	YES
WIZARD80	MORE	NO	NO	NO	NO	YES	NO	YES	YES
VISION80	MORE	YES	YES	NO	NO	YES	NO	NO	NO
OMNIVISION	MORE	NO	YES	NO	NO	NO	NO	YES	YES
VIEWMAX80	MORE	YES	YES	NO	NO	YES	NO	NO	YES
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counterfeiting) got to check out 312 companies exhibiting in 674 booths. This was just under last year's figures and this year's projections. Computer Faire Inc. prexy **David Sudkin** called the show full to capacity and said it met his expectations. Ninety-five percent of next year's space has already been sold, with the remaining amount made up of the smallest, six-by-six-foot booths favored by startup companies and traditionally not taken until close to exhibition time. The Tenth West Coast Computer Faire will be March 21–24, 1985, again in Civic Auditorium/Brooks Hall in downtown San Francisco. **JP**

☐ **Penguin Software** (Geneva, IL) has raised the price of its single-sided games to $29.95. Citing changes in development, production, and advertising costs, the company is returning to its pre-March 1983 prices. It was on that date that the company embarked on a six-month pricing experiment in which each recreational software package was priced at $19.95, in the hope that volume would make up for the difference in revenue. The experiment was a success. "If we could support ourselves and grow on volume alone, we'd be fine," says Penguin president **Mark Pelczarski**. "But costs like advertising and development haven't remained proportional with the market." Most of Penguin's future software will take more than a year of development time, he explains. This is because most of the Apple software will be written for 128K, double-hi-res machines, a more time-consuming format in which to work.

☐ **Adventure International** (Longwood, FL) has announced a reduction in prices for its newest adventures, including the Marvel Comics tie-in line (which starts with *The Hulk*, to be released this month). The new price is $24.95, down ten dollars from the standard $34.95. Prices on adventures already released will stay at $34.95 for the time being, but may drop to the new level. Citing reasons for the price reduction, a marketing spokesperson for the company said, "There's a lot of competition out there." Also, the company announced that the AI line of arcade games, previously $34.95, will now retail for $19.95.

☐ Publishers interested in registering their programs to be nominated for the Annual Software Gold Disk Awards can contact **Kapri International Distributors** (Sun Valley, CA). Categories open for nomination include business, recreation, education, utility, home, word processing, and database. For 1984's awards, graphics, screen display, music, utility originality, character originality, and best programmer of the year have been added. The programs will be judged for nomination by a twelve-member panel of retailers and users, and then sent to a select group of twenty thousand retailers and users. The winners will be announced and presented a gold plaque at the Winter CES in January, 1985.

☐ **Microsoft** (Bellevue, WA) has announced the appointment of **Jerry Ruttenbur** to the post of vice president of the retail sales division. Ruttenbur comes to the company from Koala Technologies, where he was vice president of sales, after serving with Atari Personal Computers and Warner. Previously responsible for Microsoft public relations, **Pam Edstrom** will be joining the **Waggener Group** (Portland, OR). Her position of director of public relations at Microsoft will be taken by **Marty Taucher**.

☐ International Grandmaster and U.S. Chess Champion **Larry Christiansen** has concluded an endorsement agreement with **Cyber Enterprises** (Cerritos, CA). Christiansen will endorse the company's *Cyberchess* and all related items, according to **Norbert Mikum**, company president. Christiansen achieved Chess Master status at age fourteen and was an International Grandmaster at twenty. He currently holds a national rating of more than 2,650 and an international rating of above 2,550.

☐ **Clifford Emerick** has joined **Rhino Robots** (Champaign, IL) as marketing director to launch a new dealer program. He will be expected to place the company's fully programmable, mobile Scorpion robot with twelve hundred dealers during 1984. Emerick comes to Rhino from a stint with software publisher Duosoft.

☐ **Sherwin A. Steffin**, cofounder and vice president, research and development, for **EduWare** (Agoura Hills, CA) has been appointed to the **Mayor's Education Advisory Committee** by Los Angeles Mayor **Tom Bradley**. Steffin is an educational technologist experienced in application of technology to curriculum development. The committee will advise Mayor Bradley on important educational issues upon which his administration may have some impact.

☐ **Broderbund** (San Rafael, CA) has named **Nick Ragouzis** to the post of vice president and general manager of the company's business software division. He will be in charge of taking the necessary steps to develop a more comprehensive line of business and professional software for Broderbund, known primarily for their games. First steps will be an upgrading of the packaging and documentation for the current business line and extensive promotion of that line. Ragouzis brings twelve years of computer-related experience to his new job. Six of those years were spent with Amdahl.

☐ **Camilo Wilson**, creator of the *Volkswriter* word processor and president of **Lifetree Software** (Monterey, CA), has been appointed to the **Association of Data Processing Society** (ADAPSO) and **Microcomputer Software Association Section** (MCSA) board of directors. He will serve a term of one year. Established in 1982, the software section is composed of companies that develop and market microcomputer software. As one of the six sections of ADAPSO, MCSA establishes industry guidelines that deal with software protection schemes, international business practices, copyright laws, and other essential software topics.

☐ In a campaign to attain a new level of visibility for software manufacturers and their products, **Softeam Distributors** (Culver City, CA) will embark on a cooperative advertising venture with the placement of full-page ads in major metropolitan newspapers. Each ad will feature nonconflicting software products from four or more manufacturers, as well as listing two dozen or more retailers in the city that carry these products. Retailers will qualify for the ads by purchasing a specified quantity of the advertised wares. ■

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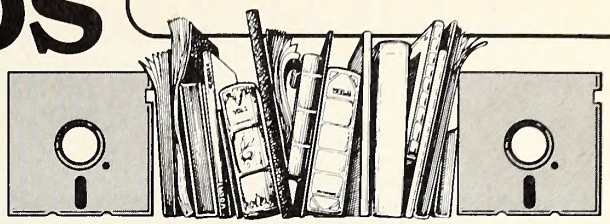

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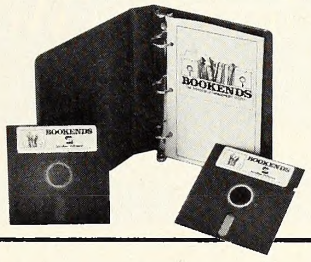

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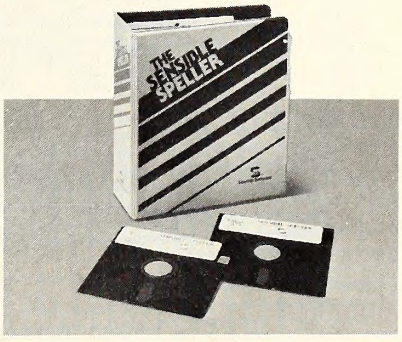

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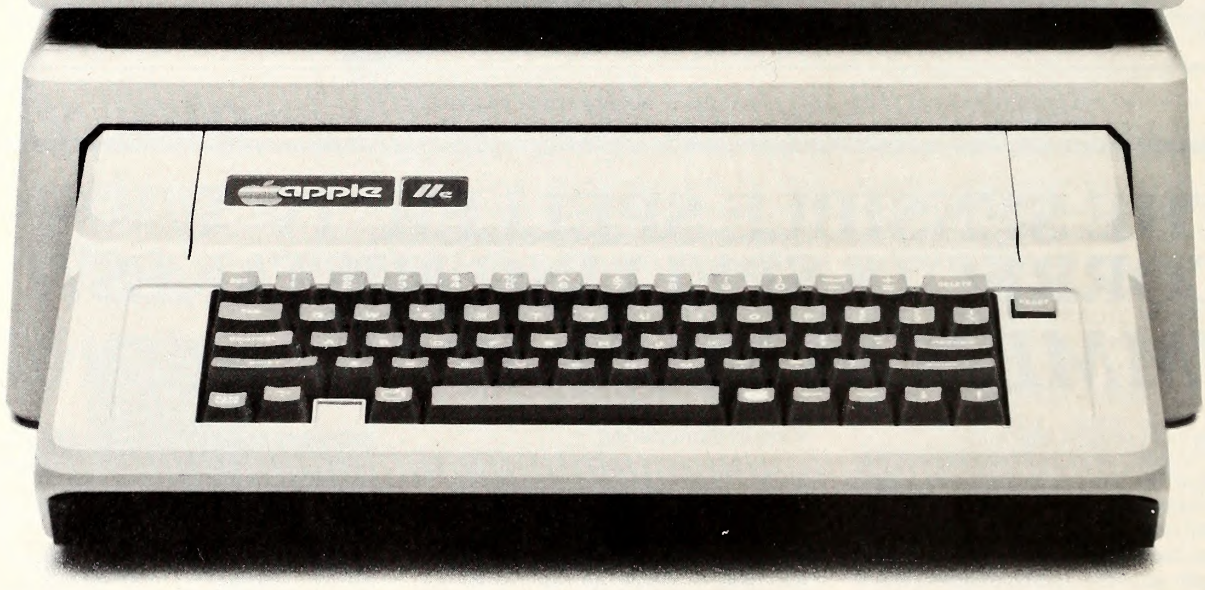

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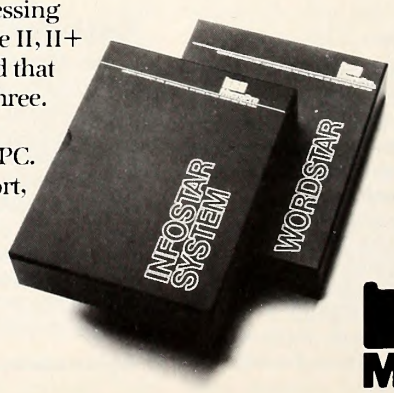

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THE BASIC SOLUTION

by Roger Wagner

The Flo-Thru On-Goto

The hardest part of any monthly column is always the first paragraph. Add to that the fact that it's the first paragraph of the first column of a series and it's enough to cause a permanent catatonic state. . . .

Whew! Now that we've got that out of the way, let's talk about what direction The Basic Solution is going to take over the next year.

This column has a number of general goals and principles behind it. The main one is to help you expand your abilities to put Applesoft Basic to work for you in solving the problems you have. To accomplish this, we'll try to show direct and efficient solutions to specific problems and in the process explore the general topic of problem-solving as a skill.

The one hundred or so commands that comprise Basic can be considered sort of an "ultimate Erector set" that can be manipulated by the user to create an almost infinite variety of applications. It is interesting to note how often a user of an application like a spreadsheet program says, "No, I'm not a programmer. I just use applications software like *Spiffy-Calc*."

With a little thought, however, one realizes that in setting up a simple template to use *Spiffy-Calc*, an entire orderly structure and sequence of instructions must be set up to properly yield the correct results when the data is entered. Sounds like programming! Henceforth, let no readers of this column think themselves incapable or unworthy of dabbling in that arena sometimes referred to as "programming." Programming is just the process of telling the computer what you want it to do on a time-delayed basis.

Furthermore, it's important to realize that the power of the computer lies implicitly in the fact that it *is* programmable. When you run only one or two prewritten programs on a computer, you have reduced its significance to that of a toaster. Toasters do specific tasks. Computers are chameleons of function.

By learning how to properly instruct your computer, you can tap into the infinite potential of your investment and discover a channel for your creative efforts that is unequaled.

This column will not attempt to teach you Basic. There are many fine books on the subject and a column within the pages of *Softalk* (Follow the Floating Point) that will help you with that.

Instead, it will be assumed that you are already more or less familiar with the overall structure of a Basic program and with the commands available. Our purpose here will be to instruct you in the focused application of those commands to help you cross that bridge to being able to program what *you* want. A toolbox does not a carpenter make. The command list of Basic is your toolbox. Here you will learn how to put it to use.

The Magic of On-Goto. One of the more neglected commands in Applesoft is the *on X goto* command. Its most common use is in the construction of menus within a program. If you haven't heard or thought about the on X goto syntax before, your menus may look something like this:

```
10 HOME: REM PRINT MENU
20 PRINT "1) PRINT A RECORD"
30 PRINT "2) DISPLAY A RECORD"
40 PRINT "3) QUIT THIS PROGRAM"
50 INPUT "WHICH ITEM DO YOU WANT?
   (1-3)";X
55 IF X<1 OR X>3 THEN 10
60 IF X = 1 GOTO 100
70 IF X = 2 GOTO 200
80 IF X = 3 GOTO 300
100 REM PRINT A RECORD
110 GOTO 10
200 REM DISPLAY A RECORD
210 GOTO 10
300 REM END THE PROGRAM
310 END
```

You'll notice that this program requires three individual lines to process the menu selection (not counting the range check on line 55). Now, as a clever programmer you might have saved a line in your program by realizing that the test for X=1 can be omitted by letting the program flow "fall through" to the first routine section like this:

```
50 INPUT "WHICH ITEM DO YOU WANT?
   (1-3)",X
55 IF X<1 OR X>3 THEN 10
70 IF X = 2 GOTO 200
80 IF X = 3 GOTO 300
100 REM PRINT A RECORD
110 GOTO 10
```

With on X goto, however, even greater economy is possible. A typical part of a program with its usual use might look like this:

```
10 HOME: REM PRINT MENU
20 PRINT "1) PRINT A RECORD"
30 PRINT "2) DISPLAY A RECORD"
40 PRINT "3) QUIT THIS PROGRAM"
50 INPUT "WHICH ITEM DO YOU WANT?
   (1-3)";X
55 IF X<1 OR X>3 THEN 10
60 ON X GOTO 100,200,300
100 REM PRINT A RECORD
110 GOTO 10
200 REM DISPLAY A RECORD
210 GOTO 10
300 REM END THE PROGRAM
310 END
```

Now we have just one line doing the work of three. The logic here is that after printing the menu and requesting a menu number from the user, line 60 will execute a goto statement to one of three lines, depending on the value of X. The on X goto function works by evaluating X and then selecting the line to jump to based on the value of X. If X is 1, then the first line value (100) will be used. If X is 2, then the second (200), and if X is 3, then the third (300).

Easy enough, and certainly better than all those if-thens.

But now for some fun. One of the things to remember, if you want to discover all that your computer can do, is to not be afraid of asking what happens when you don't follow the rules. As long as the result is predictable (even if unorthodox), it can become another ingredient in your programmer's bag of tricks.

In this case, what happens if X is less than 1 or greater than 3? The answer is that none of the gotos are executed, and program flow goes to the next statement on the line. (Program flow is a term that will be used throughout this series, and refers to the path through your program that

Applesoft follows as the program runs.)

The position occupied by X in the on X goto statement can also be a calculated quantity. We can put all this together for an even shorter setup:

```
50 INPUT "WHICH ITEM DO YOU WANT?
   (1-3)";X
55 IF X<1 OR X>3 THEN 10
60 ON X-1 GOTO 200,300
100 REM PRINT A RECORD
110 GOTO 10
```

Now, if X=1, the expression X−1 will give a result of 0, and the program flow will go directly to line 100. If X=2, X−1 will be 1, and a goto 200 will be performed. A value of 3 for X will make X−1 equal to 2, so the goto 300 will be taken.

For curiosity's sake, you may be interested to know that this last program has saved a total of twenty-two bytes over the original multiple if-then version. Not enough for another hi-res screen perhaps, but not bad for a simple trick either!

On X Goto as a Multiple If-Then. In the venerable Integer Basic, multiple if-then statements can be put on a single line. This is because—contrary to the way Applesoft handles things—if an if-then test fails in Integer Basic, program flow continues with the next *statement* on the line. In Applesoft, when an if-then test fails, the program flow jumps to the next *program line*.

This can be useful on occasion, because the if-then test can be used to "shield" the other statements on the line until they are needed. For example:

```
10 INPUT "YES OR NO:";I$
20 IF I$="YES" THEN PRINT "YOU
   ENTERED YES!":GOTO 10
30 IF I$="NO" THEN PRINT "YOU
   ENTERED NO.":GOTO 10
40 PRINT"ARE YOU BEING
   DIFFICULT?":END
```

In this program, if a particular test succeeds, then a phrase is printed, and in the case of lines 20 and 30, program flow goes back to line 10. This is possible because in Applesoft, when the test *fails*, the remainder of that particular line is ignored, and program flow goes to the next actual line number. Here, this is an advantage. But what about the next program?

```
10 INPUT"ENTER YES OR NO:";I$
20 ON LEFT$(I$,1)<>"Y" GOTO 70
30 PRINT "Y'S A GOOD START"
40 IF MID$(I$,2)<>"E" GOTO 10
45 PRINT"E IS FOR EVERY GOOD BOY
   DESERVES FAVOR"
50 IF I$<>"YES" GOTO 10
55 PRINT "AND S MAKES Y-E-S!": GOTO 10
70 IF I$="NO" THEN PRINT"ARE YOU
   BEING NEGATIVE?":GOTO 10
80 IF I$="N" THEN PRINT "DON'T BE
   SHORT WITH ME!":GOTO 10
90 PRINT"UNDECIDED?":END
```

This program tests all inputs that begin with a Y and prints certain responses depending on the input. Line 20 checks to see if the first character is a Y. If it is, line 30 prints the first response phrase. Lines 40 and 45 check for and respond to an E as the second character, and lines 50 and 55 complete the process. If the second or third tests fail along the way, program flow returns to line 10 to reask the question.

It is a shame, though, that line 20 and each successive if-then must be used all by themselves for each test. By using the "flow-through" nature of on X goto, though, we can combine everything onto a single line:

```
10 INPUT"ENTER YES OR NO:";I$
20 ON LEFT$(I$,1)<>"Y" GOTO 70:
   PRINT "Y'S A GOOD START:
   ON MID$(I$,2)<>"E" GOTO 10:
   PRINT"E IS FOR EVERY GOOD BOY
   DESERVES FAVOR":
   ON I$<>"YES" GOTO 10:
   PRINT "AND S MAKES Y-E-S!":
   GOTO 10
70 IF I$="NO" THEN PRINT"ARE YOU
   BEING NEGATIVE?":GOTO 10
80 IF I$="N" THEN PRINT "DON'T BE
   SHORT WITH ME!":GOTO 10
90 PRINT"UNDECIDED?":END
```

For purposes of readability, line 20 has been listed with one statement per line on the page, even though it would not normally be entered this way.

The first new concept here is substituting the usual arithmetic calculation of X to a *logical* operation. Logical operations test the true or false nature of a comparison (for equality or greater-than/less-than) and return a result equal to 0 or 1. A 0 indicates that the comparison failed; a 1 indicates that it succeeded.

At the beginning of line 20, if the first character of the response string (I$) is not a Y, program flow will jump to line 70 in the bottom half of the program. If the first character is a Y, program flow will continue with the next statement on the line. Again, a logical operation comparison is done on the input string, an on-goto is used to branch out of the line if the test fails.

This sort of sequence can be repeated as often as you wish within the usual limits on line length, and you may use any logical comparison or arithmetic expression to produce the result for the on-goto that you desire.

Study the first listing thoroughly until you are comfortable with the ideas behind each statement. If a particular item like the MID$ function is still a little fuzzy, don't hesitate to go back and check your *Applesoft Basic Programming Reference Manual*. The manual is meant to be used like a dictionary, not read like a novel. The more prolific the programmer, the more his manuals look as if they've doubled for phone booth yellow pages!

Next month, there will be another Basic Solution. Ideally, we would like to respond to your problems and suggestions, so why not set a pad by your computer now and start keeping a list of all those little annoyances you'd like to send to somebody else? We're not looking for (and probably will politely ignore) questions like, "How do I write a database?" We hope to get questions like, "How do I find the third letter in a string?" or tips like, "Here's a neat way to use one if-then where you used to need two!"

Thanks to Craig Peterson for the on X goto tip for this month. Until next month—Happy Appling!

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What's your reward? It may be a moment of shared pride as your six-year-old shows you the solution to one of *Gertrude's Puzzles*.™ Or it may be the special satisfaction you feel when your grown-up teenager calls home from college to say that Boolean algebra seems, somehow, very familiar.

You can be sure of one thing. It will be very precious.

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The Learning Company™

The Schoolhouse Apple

by Carol Ray

Telelearning, Traveling Computers, and More

The Personal Connection. For anyone who's been through the correspondence school experience, or who has attempted to juggle a busy schedule around night school one or two evenings a week, or who is housebound due to physical incapacity or some other reason, Telelearning Systems of San Francisco just might be the answer. On March 8, at a press conference in New York attended by Donald Senese, the U.S. Assistant Secretary of Education, and a number of college and university presidents and deans, a student was enrolled in an accredited college course to be taught through a home computer—the first of its kind anywhere.

The student's name is Bobby Cugini. The victim of an automobile accident that left him without the use of his legs, Cugini is going to be working for his B.A. at Edison State College in Trenton, New Jersey. Edison is one of the more than two hundred colleges and universities currently evaluating and developing courses to be offered over Telelearning's Electronic University network. Others include Ohio University, the University of Wisconsin, the New York Institute of Technology, and San Diego State University.

The classes available through the Electronic University system prepare students to take subject exams offered by the College Level Examination Program. All such tests are given by the College Board. There are one thousand CLEP test centers; students can choose the one most convenient for them. Test scores are then sent to any of the seventeen hundred colleges and universities that offer appropriate college credits based on their ratings of CLEP scores.

The course listings for the Electronic University include classes in the areas of professional and career development, home education, and self-improvement/hobbies. These range from "Starting and Managing Your Own Business" to "The California Wine Connoisseur." In addition, students can prepare for proficiency exams or college credit exams by enrolling in basic-level classes in either the humanities or business. Test-taking strategies are the focus of a series of courses designed for those planning to take such professional exams as the MCAT, the LSAT, or the CPA examination. Finally, several courses are offered that provide a practical introduction to personal computers and their applications.

How Is It All Possible? By now you're probably thinking that in order to get involved in the Electronic University, you've either got to be a telecommunications whiz, an oil magnate, or both. Wrong! In fact, all you really need is about ninety dollars for the Electronic University software and Telelearning Knowledge Module, which work with your telephone and an Apple II, IBM PC, or Commodore 64. Classes cost anywhere from $35 to $100, with all communications costs included in the course price.

So far, so good. But what about all the protocols, user codes, and log-in sequences (not to mention lost messages and network shutdowns) that you've heard so much about? Well, thanks to the three public networks in the Telelearning system—Tymnet, Telenet, and Uninet—any problems with a network connection will cause the system to switch to the secondary network, and to the third if another problem is found. To counteract errors in transmission, a high-level protocol verifies all data sent (both to and from the home computer) and automatically causes a retransmission whenever an error is detected.

Unlike other telecommunications products, the Telelearning system incorporates into software all the protocols needed to turn a personal computer into a host computer. File transfer, message storage, and transmission of digitized photographs or graphics are all done automatically and at reduced cost to the user, since auto dialing is accomplished without a "smart" modem.

Once you become a student at the Electronic University, you and your instructor are assigned an electronic memory mailbox number on the Telelearning central computer. Messages can be sent or received by either of you twenty-four hours a day from more than three hundred fifty cities in the United States and more than forty countries overseas. Whenever it is mutually convenient for you and your teacher to "talk," a single keystroke is all that is needed to initiate interaction between the two computers. Messages, questions, and answers can be sent and received with virtually no delay.

For the most part, the effects of the Electronic University have yet to be felt, but they are expected to be powerful and far-reaching. The combination of customized, individualized instruction, inexpensive hardware, and flexibility as to when and where learning takes place is one that holds vast potential to improve the quality and availability of higher education everywhere.

Telelearning Systems, 505 Beach Street, San Francisco, CA 94133; (415) 928-2800.

On the Road Again. "Chips and Changes" is the name of a traveling exhibition organized by the Association of Science-Technology Centers and scheduled to tour a number of American cities over the next two years. Cosponsored by the National Endowment for the Humanities and the Intel Corporation, the exhibition uses interactive computer displays, robotics, audiovisual presentations, and live demonstrations of microelectronic products and services to show how microchips are changing the way Americans work, play, learn, and think.

In an effort to demonstrate the educational potential of personal computers in the home and classroom, Scholastic Inc. will be showing two of its Wizware products, *Spelldiver* and *Agent USA*, as part of the event. *Spelldiver* is designed to increase word recognition and retention, build vocabulary, and strengthen spelling skills, as players dive underwater to uncover giant words hidden by "lettermoss." *Agent USA* challenges the player's planning and problem-solving abilities in an action-adventure game. Scholastic's two computing magazines, *Family Computing* and *K-Power*, will also be displayed throughout the exhibition with the aid of a mobile robot.

"Chips and Changes" is currently scheduled to open at the Oregon Museum of Science and Industry in Portland on June 9 and run through August 5. Beginning on January 26, 1985, and continuing through March 24, the Museum of Science and Industry in Chicago will be the exhibition's host. Other show dates in 1985 are as follows: April 13–June 9, the Science Museum of Virginia in Richmond; June 29–August 25, the Museum of Science in Boston; September 14–November 10, the Franklin

Institute in Philadelphia; and November 30–January 26, 1986, the North Carolina Museum of Life and Science in Durham. Dates and locations for the remainder of 1984 have yet to be announced.

For more information, contact Avery Hunt at Scholastic, (212) 505-3410.

Teaching Pascal. Craig Nansen, a teacher at Minot High School in Minot, North Dakota, has developed an eighteen-week course in Pascal programming. A description of the course was published in a two-part article in *Electronic Learning*, copies of which are available from the author (address follows). The course is designed for high school students who are getting their first exposure to a programming language.

Topics for the first nine weeks of the course include "Introduction to the Editor and Filer," "Introduction to Pascal," "Working with Loops," and "Introduction to Functions." During the ninth week a three-day test is given, in which students are required to write and correct short programs and to solve problems while at the computer. The second half of the course introduces students to strings, arrays, the binary number system, and record keeping. Weeks 17 and 18 are spent reviewing course material, finishing up term projects, and taking a three-day final exam.

Sample programs, tests, quizzes, and other handouts are contained on a series of twenty disks, copies of which can be obtained by writing to Craig Nansen, 1112 Glacial Drive, Minot, ND 58701. There is a five-dollar charge for each disk.

Conference News. The sixth annual National Educational Computing Conference will be held June 13–15 in Dayton, Ohio. Conference organizers, which include thirteen scientific and professional groups interested in educational computing, have announced four major objectives: to present in one forum major advances regarding the use of computers in instruction; to promote interaction among individuals at all levels who are involved in using computers for instruction; to coordinate the various professional groups devoted to educational computing; and to produce a proceedings report giving the status of computers in education.

For more information, contact Lawrence A. Jehn, Computer Science Department, University of Dayton, Dayton, OH 45469; (513) 229-3831.

The Association for Small Computer Users in Education will hold its annual conference June 17–20 at Western Kentucky University in Bowling Green. Special emphasis will be given to such topics as academic computing, robotics, computer applications in libraries, and effective use and control of institutional word processing. For more information, contact Dudley Bryant, Western Kentucky University, Bowling Green, KY 42101; (502) 745-0111.

Summer Session. The third annual Stanford Institute on Microcomputers in Education will sponsor two five-week sessions this summer, the first from June 25 through July 27, and the second from July 30 through August 31. Both sessions will offer hands-on instruction in programming, word processing, and administrative computing, as well as guest speakers, field trips, and equipment demonstrations. Educators, administrators, and researchers interested in staying abreast of the latest applications of microcomputer technology in education are encouraged to apply early, as enrollment in the institute is limited. No prior experience or special skills are needed. As part of their instruction, participants will have the opportunity to observe youngsters at the Stanford University Computer Tutors camp.

For further information about the institute, on-campus housing, financial aid, and the camp, contact the Stanford Institute on Microcomputers in Education, Box K, Stanford, CA 94305; (415) 322-4640.

Lesley College in Cambridge, Massachusetts, is offering an intensive, week-long summer course for professionals entitled "Microcomputers in Special Education: Today's Challenge." Participants will hear a combination of presentations by leading researchers and practitioners in both special education and microcomputer technology. They will also have the opportunity to participate in panel discussions and hands-on sessions at the Lesley College Microcomputer Laboratory. Little or no experience with microcomputers is assumed.

Some of the topics to be covered are Logo and its applications in teaching students with learning disabilities, language disorders, and physical handicaps; computer-assisted instruction in areas such as language arts, math, and science; the evaluation of software for use with special-needs students; and model programs currently in use in New England combining special education and microcomputers. Participants will be encouraged to develop individual projects for classroom use in their own school systems.

The session will run from Monday, July 16, through Friday, July 20, from 9:00 to 4:00 daily. Brochures and registration information can be obtained by contacting the Lesley College Graduate School, Division of Education, 29 Everett Street, Cambridge, MA 02238; (617) 868-9600, ext. 367.

The Voice of THE TURTLE

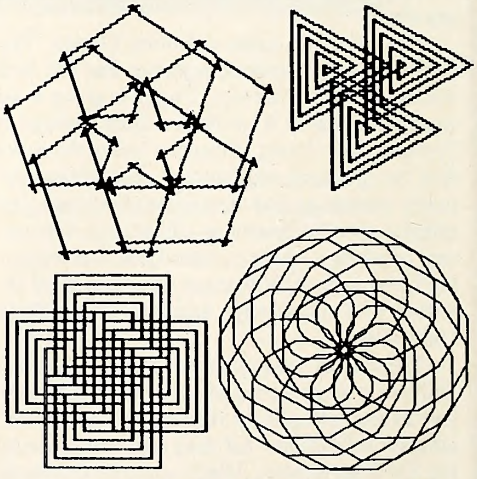
A Schoolhouse Apple Tutorial

LOGO

DONNA BEARDEN

Spirolaterals

What do the following designs have in common?



If you said they're all interesting, we'll accept that. If you said they all seem to include some sort of spiral, you're on the right track. The designs were all made with variations of the same spirolateral procedure.

Spirolaterals are made following a certain kind of mathematical pattern. Mathematical patterns show up everywhere—in the shapes of leaves, the placement of sunflower seeds, the numbers of petals on flowers, the construction of seashells. Spirolaterals, believe it or not, came from studying the feeding patterns of prehistoric worms. There's probably another article or two here, but for now, we'll concentrate on the patterns and the Logo experience.

A spirolateral is a series of lines and turns, repeated over and over. To construct a spirolateral, select a series of numbers. To keep it sim-

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Word & List Tutorial	Yes	No
Word & List Commands	Yes	Yes
User-Defined Error Handling	No	Yes
Program Tracing Capability	Yes	No
Workspace	Larger	Smaller
Suggested Retail Price	$99.95	$99.95

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Check the chart for yourself. When all is said and done, it's easy to see why Terrapin Logo, the Unofficial Apple Logo, is still better than the official one.

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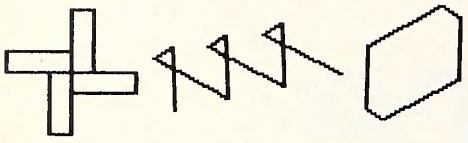
Terrapin Logo runs on the Apple II, II+, IIe and Franklin computers, and requires 64K RAM.
Franklin is a trademark of Franklin Computer Corporation. Apple is a registered trademark of Apple Computer, Inc.

ple, make them multiples of ten. Let's start with three numbers, 30, 10, and 40, and a 90-degree turn. SPIRO can be defined as:

```
TO SPIRO
FD 30 LT 90
FD 10 LT 90
FD 40 LT 90
END
```

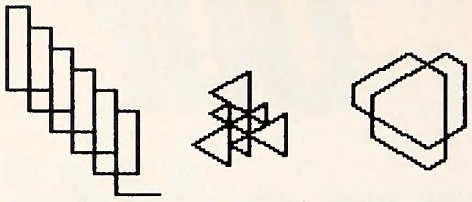
How many times would you have to repeat SPIRO to draw a closed figure? Suppose we change the left turn to 120. Can we draw a closed figure? And if we change the turn to 60?



Each question you ask about a spirolateral suggests another exploration. Let's add another number (side and turn) to the series and see what happens. We'll also define the procedure using a variable for the angle to make it easier to try different figures.

```
TO SPIRO :A
FD 30 LT :A
FD 10 LT :A
FD 40 LT :A
FD 20 LT :A
END
```

Now when we try the procedure with a 90-degree turn, the figure does not close. With a 120-degree turn, it closes with three repetitions, and with a 60-degree turn it closes with three repetitions.



Take some time to explore. Try varying your series of numbers, as well as varying the number of numbers in your series. In all likelihood, your curiosity will be aroused, for there seems to be a pattern to the pattern. Let's set up a logical series of steps to search out the mathematical pattern of closing and nonclosing figures.

Varying the series itself doesn't affect whether a figure closes or doesn't close. In other words, if we have five numbers in the series, 10, 20, 30, 40, and 50, it doesn't matter in what order we arrange them. SPIRO with a 90-degree turn will close with four repetitions; with 120, it will close with three repetitions; and with 60, it will close with six repetitions. Each of the numbers in the series represents a forward movement or a side. It is the number of sides that determines whether a figure closes.

With that in mind, let's set up a chart with a number of sides and turning angles. We'll fill in the chart with the number of times the spirolateral procedure must be repeated to close the figure. If it doesn't close, we'll indicate it with DC. We'll work with the angles that produce triangles, squares, pentagons, hexagons, octagons, and, just for fun, stars. The first two rows are filled in for you.

	Angles					
Sides	120	90	72	60	45	144
5	3	4	DC	6	8	DC
6	DC	2	5	DC	4	5
7						
8						
9						
10						
11						
12						

If you've been editing your spirolateral procedure over and over to add another FD and LT command, you've probably figured out that there's an easier way to work with it. Define the SPIRO procedure with three variables, one for the side, one for the angle, and one for a counter so that you can vary the number of sides each time without redefining the procedure. Since the order of the numbers in the series doesn't matter for what we're doing, we'll set up a procedure that draws sides in increments of ten.

```
TO SPIRO.A :S :A :C
IF :C = 0 [STOP]
FD :S LT :A
SPIRO.A :S + 10 :A :C - 1
END
```

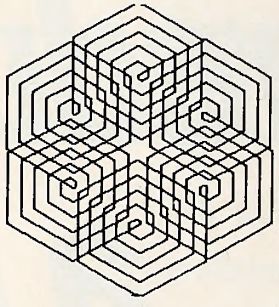
By using a counter, we can indicate how many sides we want. SPIRO.A 10 90 13 will draw a SPIRO with thirteen sides, each side ten turtle steps longer than the previous one.

Now it will be easier to continue to explore. Try figures with thirteen to twenty-one sides. If you have filled in the chart and continued with your own chart, you should be able to predict which figures will close and which will not for any number of sides. You also should see some important patterns of related geometric shapes, triangles and hexagons, squares and octagons, stars and pentagons.

When the number of sides becomes very big, some figures will not fit on the screen. Redefine SPIRO to draw sides in increments of five, or even two or one. And explore some more—you'll discover some beautiful designs. Here are two variations of the SPIRO procedure.

```
TO SPIRO.C :S :A :C
IF :C = 0 [STOP]
FD :S LT :A
SPIRO.C :S + 2 :A :C - 1
END

TO SPIRO.D :S :A :C
IF :C = 0 [STOP]
FD :S LT :A
SPIRO.D :S + 1 :A :C - 1
END
```

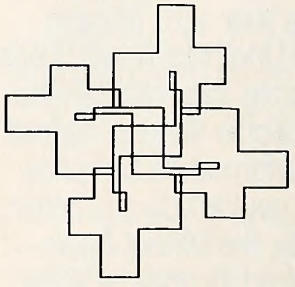


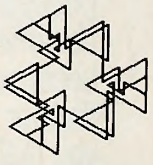
SPIRO.C 2 60 31

SPIRO.D 1 60 31

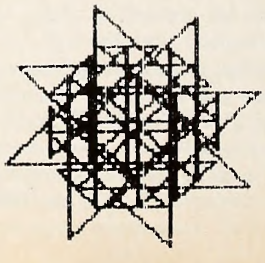
There are many other ways we can explore with spirolaterals. We could alternate left and right turns, for example, or use one right turn in a series of left turns. Will that have any effect on whether a figure closes? Try it and find out.

Here are two figures, each with seventeen sides. The procedure includes left and right turns and the following series of numbers: 5, 15, 10, 20, 15, 25, 20, 30, 25, 35, 30, 40, 35, 45, 40, 50, 45.





And if any of you get so excited about spirolaterals, here is a phone number you can call at any time of the day or night. (Oops, it's in a spirolateral and I've lost the procedure, so you'll have to figure it out from the design.)



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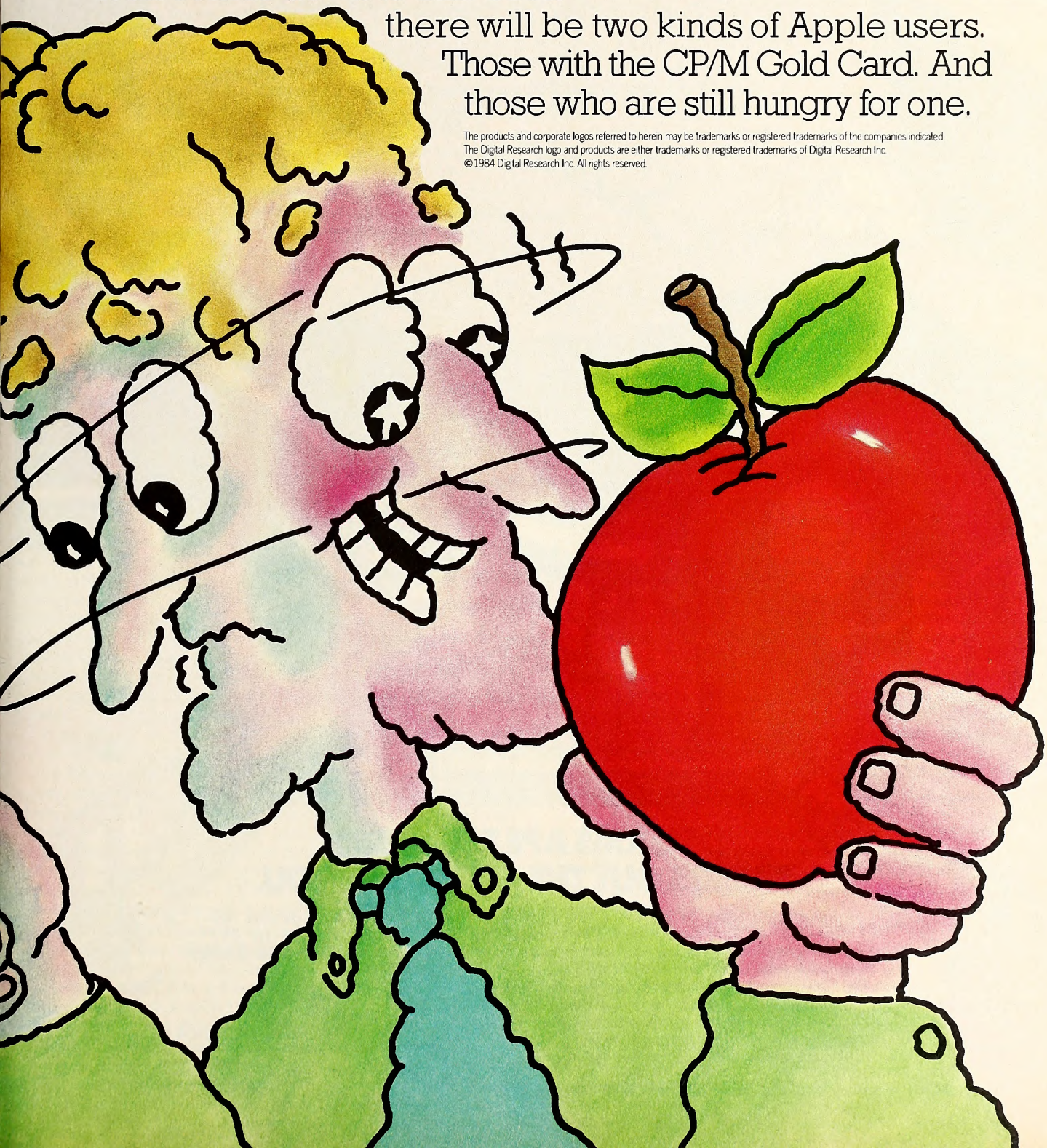


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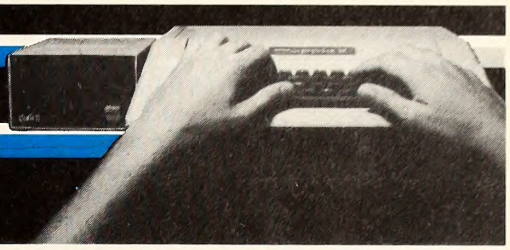
MARKETALK News



Unless otherwise noted, all products can be assumed to run on either Apple II, with 48K, ROM Applesoft, and one disk drive. The requirement for ROM Applesoft can be met by RAM Applesoft in a language card. Many Apple II programs will run on the Apple III in the emulator mode.

☐ **Apple Computer** (20525 Mariani Avenue, Cupertino, CA 95014; 800-538-9696) has released a peripheral called AppleLine, which allows Lisas, Macs, and Apple IIIs to communicate with IBM mainframes as terminals and workstations. The unit works with existing coaxial cables and 3270 cluster controllers that may already be in place. $1,295.

☐ Three new strategy games are available from **Microcomputer Games/Avalon Hill** (4517 Harford Road, Baltimore, MD 21214; 301-254-5300). *Dreadnoughts* simulates action in the North Atlantic during the years 1939–1941. Virtually every warship in the Axis and Allied navies is featured in this World War II battle re-creation. $30. *Free Trader* takes you to a far galaxy where you take an option on a commodities deal, ensuring that your products achieve their market share—all the while guarding your resources from the raiders of the Thoth Empire. $30. *Under Southern Skies* pits H.M.S. *Exeter*, *Ajax*, and *Achilles* against the K.M. *Graf Spee* once again in a tactical simulation of their historic 1939 encounter. $25.

☐ A database management system for home and business record-keeping has been introduced by **Softsmith** (1431 Doolittle Drive, San Leandro, CA 94577; 415-430-2411). *Four in One* combines major data processing operations in a single program. It can perform calculations on a defined field, for example, and then merge the field and calculation results into forms or letters with a word processor. Menu options, prompts, and system messages are displayed on the screen while working. $129.95. *LogoMotion* is an educational tool that can be used to create an interactive environment in which students can set their own pace, problems, and goals. Drawing pictures, making music, and creating programs can be used to explore the potential of the turtle graphics language. $149.95. Beginning with the "find a city" option, *Supermap* guides learners aged ten to fifteen through a self-paced educational journey of more than three hundred cities. Testing is done using a "capital quiz" option. $39.95. Couples can find out if they share similar opinions on love, romance, values, sex, and spirituality when they play *Friends or Lovers*, a set of "provocative and sometimes daring" questions written by two psychologists. Compatibility ratings and answers can be printed. $29.95.

☐ A mail-order computer accessories firm, **Gadgeteer** (1524 Pine Street, Philadelphia, PA 19102; 215-732-0965), is offering its LG20 Surge Supressor Multi-Outlet Strip for protecting small computers against voltage surges. With four outlets and a six-foot cord, the unit will absorb up to 6,000 volts or 6,500 amperes in less than ten nanoseconds, limiting voltage to a safe 205 volts. $34.95.

☐ The fundamentals of football can be taught using the first of a five-part series of football learning software from **Sterling Swift Publishing** (7901 South IH-35, Austin, TX 78744; 512-282-6840). *Fifty Defense Versus Run* combines tutorials and testing of concepts and principles with reinforcement feedback and graphics, including an automated chalkboard. Includes coaches' manual. $99.95. Preview disk, $9.95.

☐ The *1984 Intel Yellow Pages* is a two-hundred-page directory of more than two thousand CP/M software products. From **Intel** (3065 Bowers Avenue, Santa Clara, CA 95051; 408-987-5320), the publication is modeled after a telephone directory, with the first half listing suppliers and the second half listing products and service details. Free.

☐ **Getex**, a division of Lockheed-Georgia (1100 Circle 71 Parkway N.W., Atlanta, GA 30339; 404-951-0878), has introduced the Data Sentry intelligent modem, which can prevent theft and other security breaches without requiring encryption or changes in programming. The modem uses a call-up, call-back, and password sequence to thwart data thieves and, at the same time, offers all the standard features of conventional modems. A lower security mode allows users to program the modem to call back any number from which it gets a correct password. $895. Remote-ON is a unit for turning a computer's power on or off from long distance. $145.

☐ A reformatted version of the *U.S. Constitution Tutor* from **Micro Lab** (2699 Skokie Valley Road, Highland Park, IL 60035; 312-433-7550) features a tutorial mode with extra help screens and practice questions. In the test mode, any missed questions are given again in the tutorial mode when the test is completed. $30.

☐ Score your sexual IQ by answering more than two hundred multiple-choice questions in *Sexware*. Designed to educate, provoke, and surprise, the program is available from **Challenge Software** (134 West Thirty-Second Street, Suite 602, New York, NY 10001). $29.95.

☐ Two new games have been published by **Howard W. Sams** (4300 West Sixty-Second Street, Indianapolis, IN 46268; 317-298-5400). In the arcade game *Spud*, two players try to penetrate each other's shields with an exploding spud, eventually destroying the opposition's fort and winning the game. Time clock and scoreboard provided. $29.95. In *Mug Shot*, an arcade game for one to four players, each player has a fort and a field of five mugs inside a trap. These mugs are released against the opposition and must be destroyed to win. Eleven levels. $29.95.

☐ Travel from the City of Darkness to Eco-Paradise without falling into the toxic waste dump or going off on long detours; this educational quiz game asks questions about air and water pollution, acid rain, and other key environmental issues. The *Road to Eco-Paradise*, from **Center for Science in the Public Interest** (1755 S Street N.W., Washington, D.C. 20009; 202-332-9110), focuses on environmental issues and tests a player's personal impact on the environment. Test disk and supplementary educational material included. $39.95.

☐ Designed by an ex-Apple engineer, the McMill 68000 coprocessor card allows programs developed for the 68000 to run on the Apple II series, and vice versa, both in source and/or object code. From **Stellation Two** (Box 2342, Santa Barbara, CA 93120; 805-966-1140), the complete package includes hardware documentation, schemata, and *Fig Forth* software. A 68000 cross assembler is also available. $299.

☐ Fully supporting all the operating modes of the IIe, Print-It! Model 2 is a self-contained card that can handle both serial and parallel interface, forty- or eighty-column text, standard or alternate font, hi- and lo-res graphics, and more. Complete with handbook and cable (parallel or serial). No software required. From **Texprint** (8 Blanchard Road, Burlington, MA 01803; 617-273-3384). $149. Educational discounts available.

☐ The *Apple User's Encyclopedia* covers all aspects of the Apple—applications, operation, Basic programming—as well as hundreds of software packages and accessories. From **The Book Company** (11223 South Hindry Avenue, Los Angeles, CA 90045; 213-410-9466), the book also includes information on related books, magazines, and user groups. Alphabetized and cross-referenced. $19.95.

☐ **Sequential Circuits** (3051 North First Street, San Jose, CA 95134; 408-946-5240) has introduced a single-board polyphonic synthesizer, the SCI Six Voice Board (6VB). The serial board drives the Six-Track synthesizer, a unit designed to be integrated into systems containing a drum box, sequencers, and a computer. The board allows individual programming for each voice and has computer-corrected analog electronics. Each voice can represent a different timbre, with independent control over the tone, loudness, and character of the sound. Mixing inputs can be used to create whole bands, synthesizing instruments such as the trombone, organ, banjo, drum, bass, and so on. $1,095.

☐ **Datasoft** (9421 Winnetka Avenue, Chatsworth, CA 91311;

818-701-5161) has released an arcade game called *O'Riley's Mine*, wherein a dynamite-toting Irishman seeks mineral wealth while battling underground river monsters on the rickety levels of his claim. $29.95.

☐ *Speech Systems for Your Microcomputer*, by Gary A. Shade, discusses applications of voice input and output for home, industry, school, and the handicapped. The book also examines existing systems ranging in price from twelve dollars to thousands of dollars. One hundred pages of reprints from manufacturer's data sheets and a buyer's guide are included. Published by **WGBooks** (Elm Street and Route 101, Peterborough, NH 03458; 603-924-9471). Spiral-bound. $14.95.

☐ *MAP* is a database management system that searches free-text and structured data files, eliminates manual coding or indexing, and automatically indexes every item in a file. From **Softshell** (Box 18522, Baltimore, MD 21237; 301-686-1213), the program allows the formation of free-text databases for schedules, journal abstracts, and catalogs as well as references, research notes, and credit reports. Requires Z-80 card. $145.

☐ A set of four Basic programs that make scientific graphs on any 80- or 132-column printer is contained in *PlotPro Version 2.0*, from **BV Engineering** (Box 3351, Riverside, CA 92519; 714-781-0252). Linear, semilogarithmic, and full-logarithmic plots with one or two Y axes and multiple functions on the same graph can be printed. Templates are produced and information is filled in for each graph type. Menu-driven. $49.95. *SPP* is a general-purpose signal-processing program containing an integrated set of routines that analyze linear and nonlinear systems and circuits, as well as their effects on user-specified time domain waveforms. Results may be plotted with *PlotPro*. $59.95. *ACNAP Version 1.34* is a general-purpose electronic circuit analysis program that analyzes passive and active circuits consisting of resistors, capacitors, inductors, controlled current sources, operational amplifiers, transistors, and so on. Works with *PlotPro* to plot gain/phase information. $49.95.

☐ TimberTech Computer Camp has found a new home at the University of California at Santa Cruz. For boys and girls ages ten to seventeen, the computer education specialty camp emphasizes computer skills development in combination with traditional camp activities. Contact Scott Walker at **TimberTech** (Box 546, Larkspur, CA 94939; 415-461-3787) for information on camp sessions this summer.

☐ Designed for high-tech bargain hunters, *Computer Shopper* (407 South Washington, Box F, Titusville, FL 32781; 305-269-3211) is a new monthly tabloid aimed at the professional computer user. The publication features articles, hardware and software reviews, industry news, and a preponderance of classified ads with "flea market-like bargains" on a wide range of computer-related items. Robotics, data communications, and modem reviews are samples of recent feature material. One year (12 issues), $15.

☐ *Samson and Delilah* is an arcade game from **Davka** (845 North Michigan Avenue, Chicago, IL 60611; 312-944-4070). Race through the temple of the Philistines, jump over guards, mind the lion, and shake those pillars. Watch out for Delilah's fiery scissors. $24.95. A personalized study course on preparing for a bar or bat mitzvah, the *Bar Mitzvah Compu-Tutor* plays the haphtarah melodies. A bouncing ball helps students follow every syllable—using either the Hebrew text, with vowels and trope, or the English translation. Customized with the name of each student. Designed for Orthodox, Conservative, Reform, and Reconstructionist Jews. $49.95.

☐ Who's Who is now on-line. Derived from seventy-five thousand biographical profiles in *Who's Who in America*, published since 1899, the Who's Who database profiles family background, education, career history, creative works, and so on. Demographic inquiries, socioeconomic questions, and other inquiries can be made. Created by **Marquis Who's Who** (200 East Ohio Street, Chicago, IL 60611; 312-787-2008). Available for searching on Dialog as file 234.

☐ **Artsci** (5547 Satsuma Avenue, North Hollywood, CA 91601; 818-985-2922) has released an integrated software package called the *Magic Office System*. *Magic Window II* for word processing, *Magicalc* for spreadsheets, and *Magic Words* for checking spelling are integrated through a file folder and file cabinet display. Documents or parts of documents can be cut and pasted into other documents. Requires eighty columns and two disk drives. $295.

☐ Attorneys, medical specialists, general practitioners, dentists, and pharmacists can learn how to improve their microcomputer business skills with *Data Management for Professionals*, by Bryan Lewis. The book, published by **Ashton-Tate Publications Group** (10150 West Jefferson Boulevard, Culver City, CA 90230; 213-204-5570), contains information on client list management, accounting functions, cash flow, record-keeping security, client contact, and what to look for in hardware and software. $15.95.

☐ Two new arcade-style entertainments have been released by **Adventure International** (Box 3435, Longwood, FL 32750; 305-862-6917). In *C'est La Vie*, the streets are lined with money for players to pick up while evading thieves and the dutiful IRS. A loan from a neighboring loan shark may help, but players must be sure to pay it off in time. $34.95. *Gnome Valley* has players racing through a mysterious cave trying to defuse a hydrogen bomb. Alas, the resident gnomes are pronuke. $34.95.

☐ Interpret accumulated data and forecast the outcome of similar or modified undertakings with *Monte Carlo Simulations*, from **Actuarial Micro Software** (3915-A Valley Court, Winston-Salem, NC 27106; 919-765-5588). The statistical analysis part of the program employs the chi-square goodness-of-fit test to match a set of raw data to a standard probability distribution. The simulation process generates random numbers based on an assumed probability distribution using the Monte Carlo method. Menu-driven and nontechnical to use. Includes hi-res graphics, sound, and color. $60. With source code, $90.

☐ The *Basics of Basic* is a four-disk tutorial for the beginning programmer from **Focus Media** (839 Stewart Avenue, Garden City, NY 11530; 516-794-8900). An introduction to the keyboard and the fundamentals of the language are presented in twelve lessons. Documentation included. $99.

☐ Three educational games, two help programs, and two explorations of the mathematical questions that arise in the games are contained in *Arith-Magic II Area Games*, from **Quality Educational Designs** (Box 12486, Portland, OR 97212; 503-287-8137). Designed for children in grades four and up, the games develop and use concepts of area and parameter, with explorations leading to the graph of the hyperbola and the parabola, provoking questions about measurement. $35.

☐ A twelve-page catalog of health-related software is available from **CTRL Health Software** (18653 Ventura Boulevard, Suite 348, Encino, CA 91356; 818-788-0888). Categories of software that can be ordered by mail include diet and exercise, smoking and alcohol, sex and reproduction, psychology, stress and memory, and more. Catalog is updated regularly and includes many hard-to-find programs. Free.

☐ The *Early Childhood Readiness Skills Series* is a series of multidisk packages covering the areas of classification, ordering/sequence, spatial relations, counting skills, and language arts. From **Aquarius** (Box 128, Indian Rocks Beach, FL 33535; 813-595-7890), the series is recommended for use with early childhood and remediation programs, and for use by learning-disabled, hearing-impaired, and physically disabled children. $29.95 per disk. Series price: $102. Catalog is free.

☐ *Spell-It!* is a spelling instruction and testing system from **MultiMedia Software** (Box 5909, Bethesda, MD 20814; 301-951-3646). Equipped with a cassette interface for hearing the correct pronunciation of a word, the program allows teachers to create their own spelling lessons with accompanying tapes. Tests can also be created with the package and, after administrating the tests, results can be summarized using the report program. Package comes complete with microphone and earphones, sample lesson cassette, and audio enhancer unit. $179. *Storyboard II* is a courseware design package that applies pad and pencil storyboarding techniques to the planning, testing, and authoring of interactive instruction for education and training. All elements can be controlled simultaneously, from text and branching to videodisc/tape frame numbers. $185. Versions that support popular videotape and videodisk systems: $325.

☐ New from **Dynacomp** (1427 Monroe Avenue, Rochester, NY 14618; 716-442-8960): *Genesis, The Adventure Creator*, an authoring tool for the creation of your own text adventures without learning to program. A moderate game of about thirty-five locations can be created in a few hours. Originally published by Hexcraft. $39.95. *Talking Typewriter* combines graphics and sound to teach the alphabet, numbers, and the keyboard to young children ages three to eight. Players must press the correct key to launch a missile toward a moving target. No hardware needed. $19.95. With graphics that simulate a playing table, *Domino* is a computer version of the ancient game, pitting you against the computer on three levels of play, from novice to expert. Twenty-eight-page manual describing the game and strategies is included. $29.95. *Operations*

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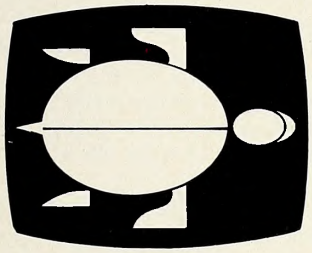

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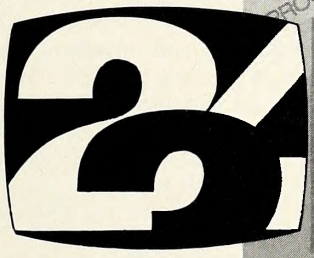
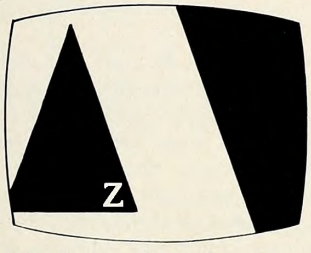
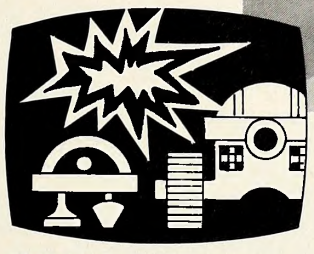


NumberSprites. Colorful sprites and speech teach numbers and quantities.



AlphaSprites. Children learn the alphabet with the aid of sprite animation and speech.



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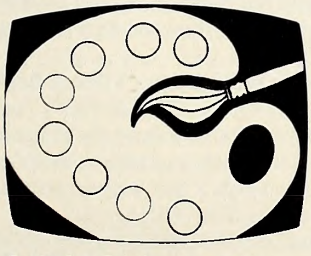

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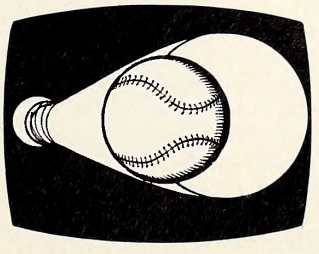

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Research Tutorial is a collection of seventeen menu-driven programs that provide data file creation, manipulation, and calculation capabilities in support of the analysis of payoff tables, simplex linear programming, distribution/transportation methods, and CPM/PERT analysis. Includes practice examples, making it useful for beginners as well as professionals. $99.95. Designed for scientists, engineers, students, and photographers, *Digital Imaging Processing* allows a user to digitally manipulate images to remove interference, noise, improve contrast, sharpen, and generally filter images. Fifteen samples included. $59.95.

☐ The Computer Supermarket is a two-day personal computer show to be held at the San Mateo County Fairgrounds June 9 and 10, sponsored by **Microshows** (Box 4323, Foster City, CA 94404; 415-571-8041). A variety of hardware and software for business, educational, entertainment, and home use will be available for purchase on the spot. Hours are 10 a.m. to 5 p.m. daily. $6.

☐ A complete hardware and software package for generating interactive graphics, *The Graphics Tool Kit*, from **Demco Electronics** (10516 Grevillea Avenue, Inglewood, CA 90304; 213-677-0801), has a viewing window resolution of 640 dots by 384 lines. The main menu-driven program manipulates vector shapes, displays fonts, draws lines, and plots points. Other segments include a vector shape table maker and a font maker. Charts, sheet music, floor plans, circuit diagrams—anything that will fit on an 8 1/2-by-11 piece of paper—can be generated. Utility programs included. $495.

☐ **Hartley Courseware** (Box 431, Dimondale, MI 48821; 517-646-6458) has announced the Medalists series of programs to aid elementary and secondary social studies teachers. The six titles are *Continents*, *States*, *Black Americans*, *Women in History*, *Presidents*, and *Create* (for the creation of custom lessons). Clues or facts at varying levels of difficulty are included for each famous person, state, or continent. Students buy clues—those who discover the answers by using only the most difficult clues are the winners, or medalists. Records are stored for the instructor, and students may compete against themselves or against the top three students. $39.95 each.

☐ Beginning a software search? A software locator service survey available from **Associated Technology** (Route 2, Box 448, Estill Springs, TN 37330; 615-967-9159) identifies more than fifty major locating services, citing more than three hundred thousand software packages representing more than eight thousand software companies. $8.50.

☐ An electronic weighing platform with an RS-232 output has been marketed by **International Computing Scale** (23011 Moulton Parkway, Laguna Hills, CA 92653; 714-951-9658). The SM232 scale will give an accurate digital output for weight applied anywhere on the surface of the platform and exceeds all National Handbook 44 weighing requirements. Comes in standard weighing capacities of 20, 50, 100, and 200 pounds or their metric equivalents. Other capacities up to 2,000 pounds available. In quantity: $495 each.

☐ **Microcom** (1400-A Providence Highway, Norwood, PA 02062; 617-762-9310) has announced a 1200-baud error-correcting modem. The SX/1200 modem, part of the Era 2 family of communications systems, offers communication between dissimilar terminals, minis, mainframes, and micros. Will communicate with any product or service supporting MNP. Features auto dial/auto answer and user-selectable speeds. $599. Eight-slot card chassis (for large users): $699.

☐ More than thirty new products, ranging from portable workstations to disk storage cabinets, are featured in the new Altech computer furniture catalog from **Luxor** (2245 Delany Road, Box 830, Waukegan, IL 60085; 312-244-1800). Free.

☐ *Glossary Disk for Apple Writer* contains separate glossary files of print commands for six popular brands of dot-matrix printers. Print code can be accessed with a single keystroke. From **MinuteWare** (Box 2392, Columbia, MD 21045; 301-995-1166). Also contains information on how to use your printer's foreign characters. $14.95. *Minute Manual for PFS:File/Report/Graph/Write*, by Jeffery Lesho and Jim Pirisino, is a book explaining the integrated software system. A quick guide section contains more than fifty step-by-step procedures, many not found in the PFS manuals. Two business and education tutorials are included. $12.95.

☐ *Connections*, by Kathleen Martin and Donna Bearden, is a Logo-based series of booklets designed for use by individuals, small groups, or entire classes. Published by **Martin-Bearden** (1908 Sandy Lane, Irving, TX 75060; 214-253-6579), the three booklets—*The Rule of 360*, *Polyspi Inspi*, and *The Turtle Goes to Kindergarten*—contain a variety of activities to explore mathematical concepts. Students are challenged to use these concepts abstractly as they solve puzzles and problems on the computer. $7.95 each. Logo-specific disks (please specify version): $4.95.

☐ A dot-matrix printer with a print speed of one hundred characters per second across 136 columns (at ten CPI) has been introduced by **Epson America** (3415 Kashiwa Street, Torrance, CA 90505; 213-539-9140). Called the RX-100, the printer is designed for spreadsheets, ledgers, and other wide documents. The printer also offers a choice of 128 user-selectable type styles, as well as a choice of international character sets. $699.

☐ *@*&!!%# Computers* is a "newsletter of what's wrong—and goes wrong—with computers," published by **Expletive Computers** (Box 553, Mount Freedom, NJ 07970; 201-895-7292). Send them your tale of woe, complete with all the anxiety-producing details, and the newsletter will pay you $25 upon publication, if they find your story interesting, heart-rending, or amusing. One-year subscription (ten issues): $6.

☐ A series of utility routines for beginning or intermediate Applesoft programmers is available on *Disk O' Utilities*, from **Broadway Software** (642 Amsterdam Avenue, Suite 136, New York, NY 10025; 212-580-7508). Thirteen programs are contained on the disk, including a file deleter routine and an automatic line numbering routine. Not copy-protected. $12.95. The *Diskinvoice System* is a software package for small businesses that features invoicing and accounts receivable. $55.

☐ Four programmed software modules for the RB5X Intelligent Robot have been released by **RB Robot** (18301 West Tenth Avenue, Suite 310, Golden, CO 80401; 303-279-5525). The modules, which allow the robot to do specific tasks as soon as the user switches it on, are 2K or 4K EPROMS that plug directly into the RB5X. Titles are *Pattern Programmer*, for creating movement routines; *Bumper Music*, allowing simple tunes to be played; *Spin-the-Robot*, a game routine; and *Intruder Alarm and "Daisy, Daisy"*, for sensing movement. $14.95 to $24.95.

☐ The third edition of the *S. Klein Directory of Computer Graphics Suppliers: Hardware, Software, Systems, and Services* is available from **Technology and Business Communications** (730 Boston Post Road, Box 89, Sudbury, MA 01776; 617-443-4671). This latest edition contains 224 pages and identifies more than five hundred supply sources "essential to the entire computer graphics industry." Basic product information and business background on each company are featured and cross-indexed. $60.

☐ The home version of *Perplexity* contains many of the same puzzles that earned the school version, *Comp-U-Solve*, a Learning Periodicals award. From **Daybreak Software** (1951 Grand Avenue, Baldwin, NY 11510; 516-223-4666), *Perplexity* encourages players to develop and use their logic and problem-solving skills, which are considered critical for success in math and science. The three puzzles are presented in two modes of play, regular and contest. $29.95.

☐ Educational software from **Oakleaf Systems** (Box 472, Decorah, IA 52101): *Evolution* is a simulation that lets students see the effects of mutation, gene flow, natural selection, and genetic drift. Factors can be studied separately or in combination. $29.95. *Algal Growth* is a simulation that presents the effects of nitrate-nitrogen, phosphate, turbidity, alkalinity, pH, temperature, ammonia, and light on the growth of algae-simulated experiments. $29.95. *Ecological Analysis Programs* enables students to do life table analyses, community similarity, diversity indexes, capture-recapture population estimation, and more. Equations and symbols follow college ecology text models. $29.95. *Aquatic Ecology Programs* assist students with the Hynes/Hamilton estimates of secondary production, calculation of stream flow and hydraulic radius, lake morphometry, and more. $29.95.

☐ A new version of *DMP Utilities* is available from **Vilberg Brothers Computing** (Box 72, Mount Horeb, WI 53572; 608-274-6433). Version 4.3 extends support to the Apple Super Serial Interface, the Imagewriter printer, and the Microtek 611 parallel interface. In addition, the program now remembers fonts in setup and downloads a font without printing the setup message. Update free with returned disk. Without: $4.

☐ The legal questions software publishers face when buying, developing, or selling software are addressed in *Legal Care for Your Software*, by attorney Daniel Remer, published by **Nolo Press** (950 Parker Street, Berkeley, CA 94710; 415-549-1976). Issues dealt with include contracts, ROM copyrights, lawsuits, copywriting manuals, and protecting trade secrets. $24.95.

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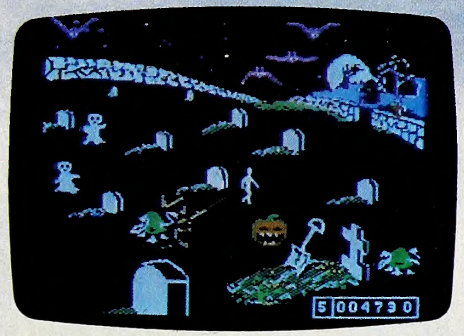

enemy. Survive, and the Mystic Slot Machine spins again, to turn up other randomly selected opponents .. until at each world's 7th stage you meet **7 at once.** Which ones? The ghost? The cobra? The death birds? The devil's lightning? Ahhhh, since they carry the curse of Randomness they **may all be different—all the same—or a terrifying mixture.**

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☐ A job-cost accounting system for manufacturers that includes general ledger, job cost subsidiaries, payables journal, and payroll has been released by **CMA Micro Computer** (55722 Santa Fe Trail, Yucca Valley, CA 92284; 619-365-9718). The *Ledger* includes five hundred accounts, and the system prepares a posting journal of all detail, a trial balance, an income statement, a balance sheet, and more. *Payroll* includes tables for federal, state, and local taxes. Requires two disk drives and 130-column printer. $459.95.

☐ Three "no-frills" carrying cases for shipping and carrying software are available from **PRC of America** (475 Boulevard, Elmwood Park, NJ 07407; 201-796-6600). The Data Vault series of cases are constructed from thick-walled polyethylene foam with a rugged, luggage-type handle and industrial-style hardware. Each case comes with a hinged lock that accommodates a standard padlock. Three sizes. $62 each.

☐ A thirty-two-page catalog of computer science books and software is available from **Little, Brown and Company's College Division** (34 Beacon Street, Boston, MA 02106; 617-227-0730). More than fifty books are featured, with titles ranging from handbooks on system analysis to language-specific programming references. Several selections are designed for those with little or no technical expertise. Free.

☐ For psychologists, counselors, and others who are familiar with the Weschler Intelligence Scale for Children-Revised, **Bertamax** (3647 Stoneway North, Seattle, WA 98103; 206-547-4056) has introduced *WISC-R Report Writer*, developed to help diagnose strengths and weaknesses related to academic subjects and to prepare reports of the results for clients. The program includes a test profile to illustrate the subtest scaled scores to help in the selection of appropriate recommendations. A listing of fifty recommendations in five general areas is available. $125.

☐ *GoGames* is an electronic go board and game-filing program for the Japanese game of go. From **Go Software** (Box 2693, Chicago, IL 60690), the program displays games at chosen speeds, using commentary and other features to enhance the assimilation of information. Graphics simulate the simplicity of placing black-and-white stones on a board. Tournament games can be saved. $39.95.

☐ A handicapped-operable replacement keyboard for the Apple II has been created by **Key Tronic** (Box 14687, Spokane, WA 99214; 509-928-8000). Individuals not having the use of both hands can now operate the Apple keyboard by the use of alternate-action keys that overcome the obstacle of having to depress several keys at once, as required in most applications. Plug-compatible, with a low-profile design. $298.

☐ **Psychological Psoftware** (4757 Sun Valley Road, Del Mar, CA 92014; 619-481-4182) has announced *Never Fat Again*, a behavior modification program for weight loss. The program teaches a user to change eating habits for safe weight loss, with emphasis on how food is eaten, not what kind of food. $49.95.

☐ Write *dBase II* code with a new utility program from **Gryphon Microproducts** (Box 6543, Silver Spring, MD 20906; 301-946-2585). *dHelper Part I* gives a formatted output listing of a system of *dBase II* programs and data files. The software allows a user to set listing parameters and do macro substitution, as well as check syntax. $150.

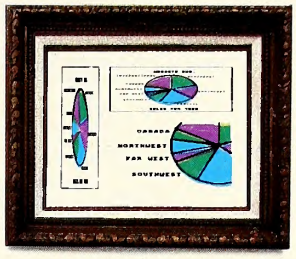
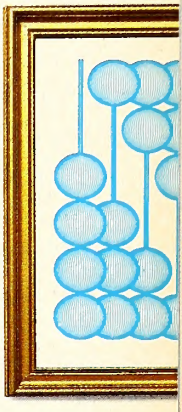
☐ The Uniprint printer card provides transfers of hi-res graphics pages one and two, expands and shrinks the images, or rotates the images in any direction by ninety degrees. From **Videx** (1105 Northeast Circle Boulevard, Corvallis, OR 97330; 503-758-0521), the board also makes color transfers on the Dataproducts IDS Prism printer. Installation manual included with details on more than twenty-five printers. With cable: $89.

☐ *Monkeynews* is the second program, following *Monkeymath*, in the Monkey Series of educational software from **Artwork Software** (150 North Main Street, Fairport, NY 14450; 800-828-6573). The program is designed to help increase reading and comprehension skills, using a participation format that allows students control of story direction and speed, as well as the action of the main character, Marc the Monkey. A branching program allows the creation of more than two dozen variations on the original story. For grades one through six. $29.95. *Monkeybuilder* is the third package in the series. This time Marc the Monkey is out to net pieces of words that, when correctly combined, form the building blocks for his home in the high trees. Each level incorporates dozens of different vocabulary, word structure, and spelling devices that increase in difficulty. Also for grades one through six. $29.95. ❐

DID PICASSO DO IT?





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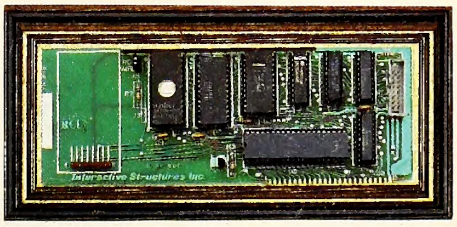

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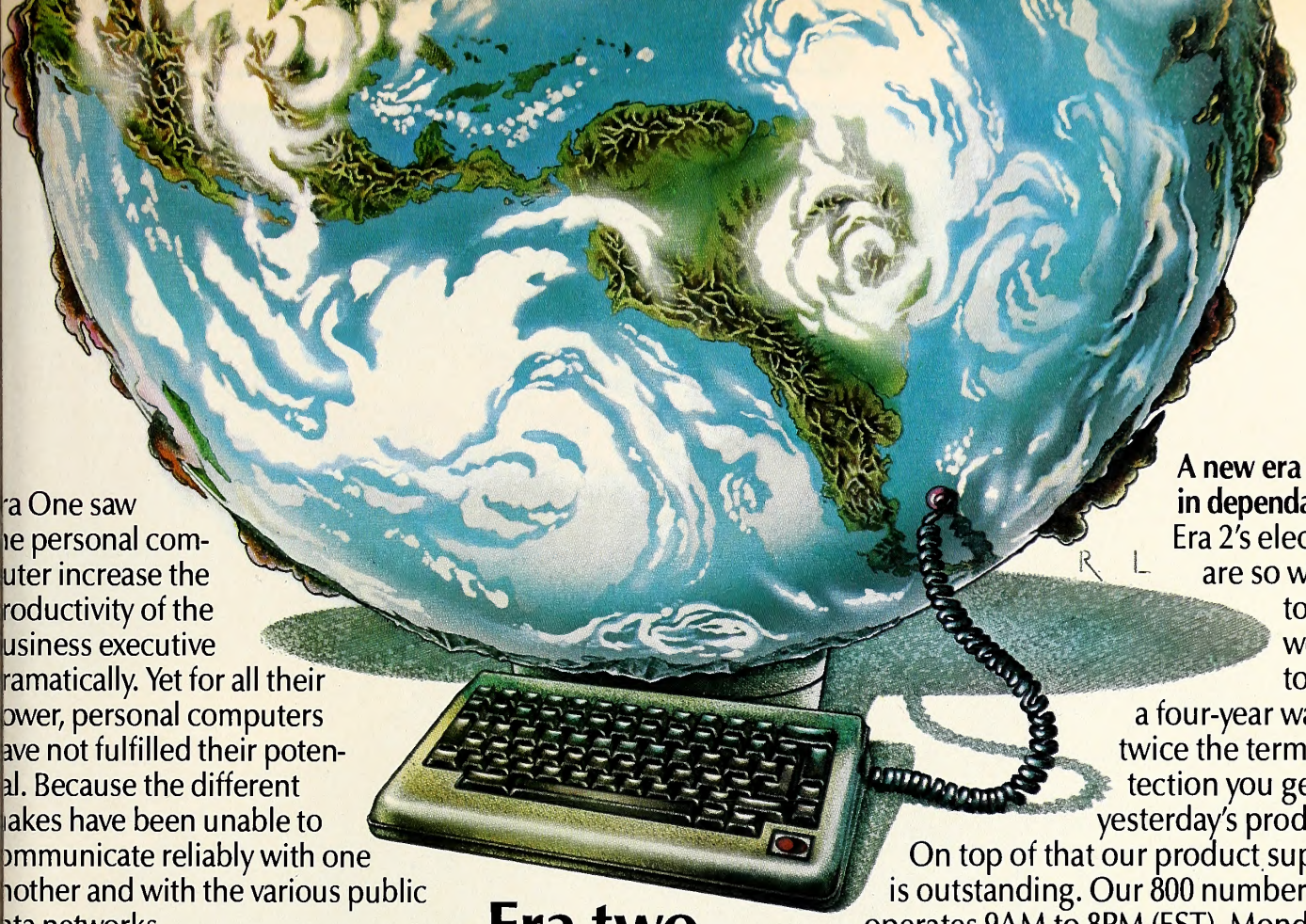

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Era 2

Melas Manzanas Apples All

BY TODD ZILBERT

It is hot in Tunis, on the Mediterranean coast of Africa. One of the oldest civilized regions in the world, Tunis is just a stone's throw from the ancient city of Carthage. The Phoenicians settled in Tunis. Carthaginian war fleets sailed from there. The alphabet originated there.

Tunis is the capital of the Republic of Tunisia. The republic, a nation of seven million people, was born in 1957 after centuries of French and Turkish rule—a young nation in the cradle of civilization. The climate of Tunisia nourishes olives, dates, lemons and limes, and all-important wheat; it is too hot for apples. But, six thousand miles from Cupertino, California, Apples are growing in Tunisia.

And Apples are proliferating all over the world. This month, *Softalk* visits some countries with many Apples and some with only a few—but each has a fresh, new flavor. Together they form a collage of Apples and Apple users.

In developing nations, where having enough to eat is a struggle, Apples are helping governments organize their resources and plan for the future. Special assignments editor Andrew Christie reports on how Apples are helping Tunisia manage the production and distribution of cereal grains. Also, this month's Newspeak column describes how a French organization is working in the heart of Africa, helping Chad—a poor, war-torn nation five hundred miles south of Tunisia—use computer technology.

Europe lies just north of Tunisia, across the Mediterranean Sea. Apples are almost as familiar there as they are in the United States. Apple has a plant in Cork, Ireland, to supply the European market, and there are sixty thousand Apples in Germany alone, where the little beige machine is known as the Mercedes of personal computers. German businesspeople have received them enthusiastically, while the German home market remains less than ideal. Apple sales representative Terry Adams reports that less than 5 percent of the Apples in Europe are in the homes.

Correspondent Eden Recor writes from Germany, "Americans can be characterized as people who will first buy a computer, then ask, 'Okay, what can it do for me?' and go on to find all sorts of uses for it. That attitude doesn't exist in Germany." Higher computer prices coupled with less disposable income make impulsive buying of computers rare. And perhaps there is a national temperament that explains the different consumer patterns, including an opinion that computer games should be free!

In his Exec on Paris-based Apple Computer International, senior editor David Hunter looks at Apple's overall strategy for marketing machines in the twenty-three countries that Apple considers its European market. The IIe, III, and Lisa have been well received, and the Macintosh is on the launching pad. Also, in "Personal Computing in the Old World," Hunter addresses the attitudes and reactions of Europeans to the personal computing phenomenon. There may be fewer users in Europe than in the States, but the excitement is strong and getting stronger.

Pommes Apfel Over the World

The worldwide spread of computers shouldn't be thought of as merely the exportation of American goods to foreign markets. Software development is an international concern. For example, the word processor *Zardax* is an import from Australia. German bakers use specially designed German bakery software, and French developers are working on hardware and software that may, in some cases, be superior to what is available in the United States. From Canada, correspondent Don Officer reports that three Canadians and American Seymour Papert developed such an impressive version of Logo that it earned the Apple brand.

Other Canadians are using Apples to manage farm production, from hogs to wheat. Apples have "pioneered dozens of applications" on farms, according to Ontario cattle rancher Betty Vandenbosch. "The Apple is a thousand dollars cheaper than any other system with suitable software." Sheep and dairy farmers an ocean away in New Zealand are also using Apples, according to correspondent John MacGibbon. Shrinking markets and prices there have forced New Zealand farmers, "already reckoned among the world's most efficient," to turn to computers for ways to improve efficiency.

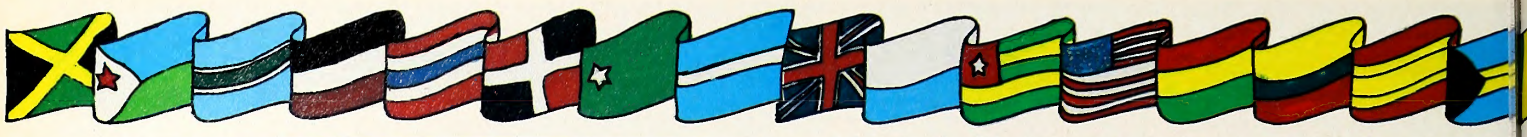
Meanwhile, kids and computers around the world are becoming inseparable. Summer computer camps are available to Australian children, who also receive computer instruction at school. And MacGibbon reports that an amazing 95 percent of the high schools in New Zealand have at least one Apple. Canada and Germany are also committed to bringing computers to their children. In Germany, some knowledge of Pascal is already required of high school students. German computer dealer Andreas Stoerzer says that a desire for greater programming capability has led German educational advisers to recommend that schools invest in Apples over Commodores, which previously had the nod.

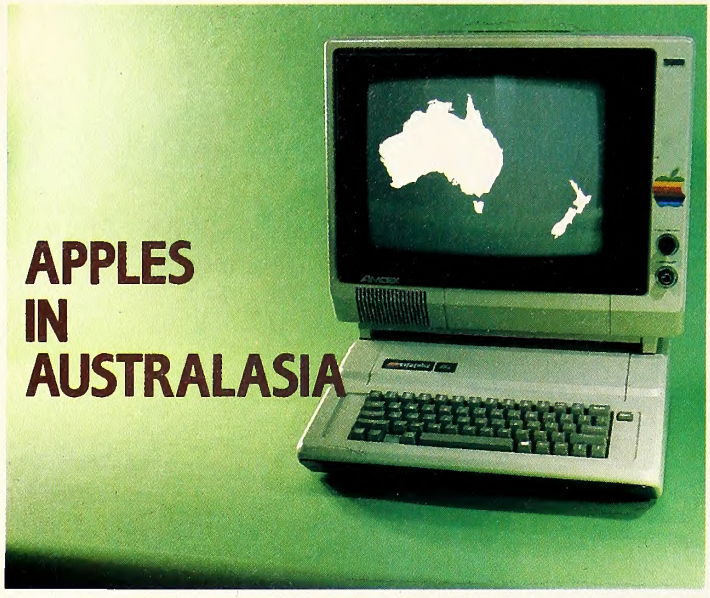
Computer users in other countries face problems unknown to American users. For instance, in New Zealand the per capita income is twenty-five hundred dollars a year less than in America. On top of this, hardware and software can cost as much as three times more. Simple economics makes it harder for even seriously interested consumers to investigate computers down under.

Language differences are an obvious but sometimes overlooked impediment to computers in other countries. In Canada, two languages are spoken; programs must accommodate both English and French. Different languages require different character sets. Non-English-speaking users require software written or revised in their native tongue, and hardware must be made to conform to language variations as well.

Maybe in the future an icon-based interface like Apple has introduced worldwide on the Macintosh will facilitate intercultural computer development, much like international road signs help world travelers now.

It may be idealistic to think that the spread of computers will engender a greater unity among nations. But New Zealand isn't so far from Canada—and the distance from Cupertino to Tunis is getting shorter all the time. ■





Do Disks Spin Backward in the Southern Hemisphere?

BY JOHN MACGIBBON

"The whole world's going to be taken over by computers and all that sort of thing," the eager youngster insists. Ten-year-old Nina Siers quits steering her turtle and leaves the Logo screen long enough to explain her presence at summer computer camp. "No one in our family knows anything about computers. I'm here to check them out and report back."

Further, young Nina insists that when computers take over the world, everything will become *dark*—"just like in *Blade Runner*." But that pessimistic vision is complicated by the fact that here she is, having fun.

Barely pausing for breath, Nina pours out her enthusiasm about programming with Logo, playing *Animals*, *Rats*, *Apple Check*, *Insulter*, *Pac-Man*, and *Lemonade*, as well as tennis, hiking, swimming, doing gymnastics, eating. . . .

None of it is dark, and everything is "just great."

Downloading with the Joneses. Yes, computers are alive, well, and bursting into everyone's consciousness down under in Australasia. Though both countries covered by that term have small populations (Australia fifteen million, New Zealand three million), the locals are well educated, relatively affluent, and have a long-time passion for keeping up with the Northern Hemisphere.

Especially in computers. Both countries see silicon technology as a great chance to break the tyranny of distance separating them from the rest of the world. It's a chance to become full-fledged residents of the new global village, and they're grabbing it.

Just as it brings Australians and New Zealanders closer to the world in terms of communications, so the micro revolution offers possibilities for new exports that will be less affected by heavy freight costs than traditional minerals and farm products are.

Higher Tech. Kiwis and Aussies are probably as interested and involved with computers as Americans, but there are differences, partly resulting from the extra cost of computer equipment.

An Apple IIe starter package including a 64K basic unit, Apple drive/controller, and Apple monitor that costs about $1,650 in the U.S. retails (in local currency) for $2,695 in Australia and a whopping $3,995 in New Zealand. Blame those figures on exchange rates, limited competition, and extortionate government rake-offs. New Zealand, which fares the worst, gets only sixty-five U.S. cents for one of its dollars and suffers a 40 percent computer sales tax as well.

These costs, in combination with lower average wages, make owning a microcomputer an expensive business. Whereas an American citizen works five weeks, on the average, to buy an Apple starter package, an Australian must work nine. New Zealanders must labor nearly fifteen weeks to join the Apple clan.

Yet people still buy. New Zealanders in particular are less concerned with trappings of affluence than Americans are and have different priorities for their incomes. They'll happily do without glittering office suites, *en suite* bathrooms, big cars, and designer wardrobes if doing so means they can buy some shiny new high-tech gear.

These are boom times for micros. Nineteen eighty-three was a very good year in Australia, though more for IBM than for Apple. In the second half of the year, Apple's share of new micro sales slumped from 27 percent to 12 percent; the IBM PC, introduced in February, was chiefly responsible. According to dealers, Apples were perceived as too expensive for the features they offered in comparison with the Commodore 64 and cheap Apple compatibles in the high-end home market and the IBM PC in the business market. In Australia, much hangs on the acceptance of Macintosh and the revamped Lisa line.

Boomier Boom. Apple's year was rather better in New Zealand. The IIe remained the top-selling micro, gaining 26 percent of new business. But IBM's PC was gaining fast, moving from 0 to 20 percent of 1983 sales.

A major survey of the New Zealand computer market published last December foretold a huge micro boom in 1984: It was predicted that the value of the entire installed micro base would rise by a whopping 86 percent. The survey suggested that business and professional markets would see the largest growth, followed by the home and education markets, in that order. About half of all purchases would be made by first-time computer users.

By the end of 1983, there were an estimated thirty thousand Apple IIs in Australia. New Zealand, with about seven thousand machines, had far fewer, though more on a per capita basis.

Good numbers of Apples are in Australian homes, but in New Zealand home sales are less than 1 percent of the Apple market. An Apple is too costly for the average Kiwi, who, if he has one, probably has a commercial excuse for it. (Sometimes rather flimsy, of course!)

Australia has particularly strong user groups. Largest is the Sydney Apple User Group, with more than five hundred members. The Sydney group has published more than forty double-sided program disks, puts out a monthly magazine, and has installed its own electronic bulletin board, through which it sells cheap club-designed modems and communications software.

New Zealand's relatively high per capita Apple ownership reflects an extraordinarily high number of computers in education and a strong business base. Apple's New Zealand distributors don't consider the Apple a home computer, while Apple Australia

must be very worried about losing its home market to cheaper brands. Home users and hobbyists in both countries are buying vast quantities of micros costing less than $1,000, such as the Commodore 64 and VIC, Sinclair Spectrum and ZX81, and a plethora of Japanese models.

It is a tragedy that, while the level of home interest is probably nearly as high down under as it is in the United States, entry-level computers tend to be underpowered machines with cassette storage that are capable of playing games, and teaching Basic, but little else in the way of practical applications.

From Apple to Zapple. In 1982, Apple's New Zealand agent, CED Distributors, scored a marketing coup by offering one computer to every high school in the country—at half price. Schools took the bait. Even after antidumping levies were added to the price, Apple ended up with a micro in nine out of every ten high schools. Sales have since increased, and about 95 percent of all high schools have at least one Apple. Some 80 percent of all computers in New Zealand schools are Apples.

Most schools have computer clubs, popular with the many students who don't have a computer at home but who are still able to converse in machine language as if it were their mother tongue. Surprisingly high numbers of New Zealand schools have large Apple networks, something that's rarely found in Australia, where few schools have more than five machines.

This year, CED Distributors is consolidating its support for education by introducing the "New Zealand Beginning," a small Source-styled database and bulletin board aimed particularly at the education market.

Wellington High, a school with about one thousand students, is on the wrong side of the tracks in New Zealand's capital city. Once the school had difficulty attracting students and maintaining student numbers. Now that has changed, largely because Wellington offers the most successful computer courses in town—on Apples, of course.

Currently the school runs seventeen IIe's with disk drives and printers, linked in a Nestar network to forty megabytes of hard disk storage. The network can take a maximum of sixty-four Apples, a goal that may well be achieved before too long, if computer director Martin Leda has his way.

The school got its first Apples in 1980 as donations from the Parent-Teacher Association. Students themselves subsequently won two more computers in programming competitions. But most of the network has been bought out of profits from evening computing classes for adults. There's been extraordinary interest in the adult computer program, which this year has more than thirty classes of about twenty-four people each. Leda expects that more classes will be added as the year progresses. Wellington High also earns money hiring out its equipment to computer camps during school holidays.

Like most New Zealand schools, Wellington High stresses Logo, especially for younger students. This approach has been encouraged by Apple's distributors, who include Logo in their package for schools. A similar Apple policy has led to widespread use of Pascal. As a result, it's claimed, there's more intensive high school use of these languages in New Zealand than there is in any other country.

At Wellington High, Logo is used in computer awareness classes by third- and fourth-form (eighth- and ninth-grade) students, who also learn a little Basic. Older students move to UCSD Pascal.

After eighteen months of teaching Logo, Martin Leda is an enthusiast. "I'm beginning to see what Seymour Papert was talking about when he said students should be programming the computers not because they want to learn to be commercial programmers but to train their own thinking," Leda says.

Photo by Joseph Permetti/Peace Corps

Rocky cliffs off the coast of Sydney, Australia. Then called Port Jackson, the city was founded as a British penal colony in 1788.

His experience is that it's hard to teach Basic as a first language. He finds that students who excel are those who are already mathematically bright and "would learn anything you put in front of them.

"Any student who has trouble with math will find computer programming difficult if he's taught Basic," he explains. "We're trying to develop the attitude here that programming and using a computer isn't difficult—it's for everybody."

Aside from work with computer languages, the school encourages students to look on the computer as a tool—with *Apple Writer IIe*, *VisiCalc*, accounting packages, and databases—for investigating ideas in mathematics, physics, graphics, social studies, and physical education.

Other than the languages and business packages, most software in the schools is from New Zealand sources. Apart from some public domain material, little American education software is used.

Aussie Net. At present, few large networks exist in Australian schools, although this may change with the introduction of cheap networking systems. The largest single installation at present is at the New South Wales Institute of Technology's accountancy school, where twenty computers are networked through Omninet to a Corvus ten-megabyte storage system. The school uses its own software, plus standard commercial accounting and spreadsheet packages.

One of the institute's lecturers, Steve Trevillion, presented a paper on the system to the 1982 Business Schools' Conference in San Francisco. He was surprised to find that the Australian

Photo by Joseph Permetti/Peace Corps

Kangaroos run free on protected land down under. Born small enough to fit several into a teaspoon, baby kangaroos crawl into their mother's pouches unaided.

system was ahead of the pack. "Our uses of the Apple personal computer proved far more advanced than methods used in other countries," Trevillion said. "Universities in Europe, England, and the U.S. will probably follow Australia in its use of microcomputers."

Overall, Apple hasn't done as well in Australian schools as it has in New Zealand's educational settings, although it is still the biggest single micro supplier, with seventy-five hundred units installed. Late last year an Australian Schools Commission report recommended the microcomputers from Apple, BBC, and Microbee for general school use. At around the same time the Commonwealth Government established a school computer advisory board and promised to spend $18 million on school computing over the next three years. Emphasis was to be placed at the junior secondary school level. (This contrasts with the New Zealand Minister of Education's priorities, which are, in order, college, secondary, and elementary schools.)

Neither country has come to appreciate the value of computers in elementary education.

Tasmania, an Australian state, known because of its fruit crops as the Apple Isle, has (appropriately enough) the highest proportion of Apples in Australian schools. It has also been most innovative in their use. Tasmanian education programs are used throughout Australia and even in New Zealand.

Most respected of the Tasmanian programs is *Convicts*, a database with details of reluctant settlers who arrived with the First Fleet of 1788. Australians are fascinated by their convict past, and this makes students eager to delve into the program and learn about information technologies.

Perhaps the most impressive single Australian education package is *Direct Helper*, a reading and spelling program designed especially for slow readers.

Australia's first computer program to help improve handwriting is in the final stages of testing by the Australian National University in the capital city, Canberra. Designed over a period of eight years, the program makes use of Apple IIs, graphics tablets, and Intex Talkers. Results in local schools have been encouraging, and commercial release is intended.

Australian education authorities have also produced interesting computer-aided instruction programs based on arcade action games, while excellent spelling and foreign language tutors have been created by a Sydney software house, Lothlorien Farming.

Software Takes a Trashing. But in neither Australia nor New Zealand are education observers satisfied with the overall range of quality of courseware available for schools. One critic is Arthur Sale, a professor of information science at the University of Tasmania: "Probably 90 percent of all courseware available today is junk," he asserts. Sale argues that there's room for a substantial Australian education software industry, given the expertise available. While more extreme in his criticisms than most educators, Sale does highlight a problem with American software: In spite of twenty years' conditioning by U.S. television programs, a broad cultural gap still exists. Many social values differ, and both Australia and New Zealand use metric measurements and British word spellings.

Teachers in Australia, like teachers everywhere, are finding it hard to keep up with the computer revolution—and particularly with some of their brighter students who, of course, spend enormous amounts of time at the keyboard. Seventeen-year-old Michael Orphanides actually took over the computer class at his Sydney high school. Orphanides doesn't own an Apple yet, but he used the school's computer to write a book, *Outstanding Games for the Apple II*, which has been released in the United Kingdom. He also has a contract to write programs for *Australian Personal Computer* magazine.

Camping with Apples. Glyn Hurley started the first residential computer camps in New Zealand, but he'd happily snap his fingers and make computers disappear. An education psychologist, Hurley has reservations about the social consequences of computerization. But he's pragmatic and aware that the machines are here to stay. "Computers are the only way to go, so I'm trying to do something about it," he says.

Hurley likens the dangers of computers to those of television, but says computers can have far graver consequences. "People said TV would do terrible things to us. It did kill conversation and decrease interaction between people, but we've adapted to it," Hurley says. "TV has nowhere near the degree of involvement that a computer has. TV is interest-arousing, but the ultimate in human experience is interactive performance. Computers require interactive performance."

Hurley says computers encourage complete absorption, something that makes people quite unaware of the passage of time. But it doesn't necessarily make people happy, and it certainly doesn't improve communication between people. To counteract such insidious tendencies, Glyn Hurley works social skills components into his camps by means of sessions of what he terms "social training."

"We have very simple exercises, like the youngsters turning to look at each other when they're talking, or passing compliments," he says. An important part of the sessions is confidence building, which Hurley considers particularly helpful to the many children he sees who are introverted or lack confidence. Some of the activities are organized so that children have to co-

operate in pairs.

Students are encouraged to think of the computer as a tool, not as an end unto itself.

Most activities at his six-day camps are standard fare: physical activities, including an outdoor challenge course, gym work, tennis, skating, hiking and nature study in the nearby mountains, swimming, and, of course, computer time, the favorite of all.

The kids have one computer each, either an Apple, a Commodore VIC, or a BBC Acorn. Apples are used especially with rank beginners, because of the availability of Logo. More advanced kids work on self-paced lessons in Basic and Pascal. Older students can also learn about word processing, flow charting, file writing, and database operation.

Glyn Hurley is particularly interested in databases, believing effective use of them to be the ultimate point of computer training. Senior students even have the opportunity to contact overseas databases, such as The Source.

Beach Blanket Basic. Competing with Glyn Hurley's setup in New Zealand are camps run by a former associate of Hurley's, Barry Small. Small's Adventure Holidays organization even exports its live-in camps across the Tasman Sea to Eleanora Heights, within cooee of Sydney's famous surfing beaches.

The only other residential computer camp in Australia is at a farm near Mount Barney National Park in Queensland. Accommodating eight people at a time, Lynn and Tom McHale's camp is aimed particularly at parents who want to unravel the mysteries of computing along with their children.

Other Australian holiday computer courses are nonresidential—at Sydney's University of New South Wales and Adelaide's Institute of Technology.

Digging the Good Dirt. New Zealand may be well into the computer revolution, but the big money is still made down on the farm. Most export income comes from sheep meat, beef, wool, dairy products, and horticultural produce, especially apples and kiwifruit.

This small country was developed as Britain's farm in the South Pacific, and that was the basis for a standard of living that was the fifth highest in the world at one point during the 1950s. But times change; terms of trade for primary products declined, and traditional markets in Europe have gradually been closed off by European Economic Community trading policies. Agricultural protectionism in the United States and Japan hasn't helped either.

With declining markets and declining prices, New Zealand's farmers, already reckoned among the world's most efficient, have had to look for even greater efficiencies. Many are considering microcomputers and agriculture databases. At present four local companies sell farm computing systems. Two of these systems run on the Apple II.

In Christchurch, Rural Computer Systems supplies a hardware and software service adapted from the English Farmplan system, which is also used in European countries, the U.S., Australia, and South Africa. The system includes a specialized database, a dozen or so financial and farm management templates for either *VisiCalc* or *Multiplan*, and a variety of other financial and farm management programs.

You can even purchase programs to raise deer, currently a fashionable and profitable activity. (The deer yield venison and high-priced antler velvet, which is exported to Korea for use in aphrodisiacs.) Reliability was the reason another farm software house, Agricultural Computer Services, chose Apples. The new company, based in Napier in the North Island's Hawke Bay, is a joint venture between a farm service company and a microcomputer retailer. It offers cash flow recording systems, stud recording software, and a number of smaller utility programs.

Photo by John MacGibbon

Rank beginners at a New Zealand computer camp are lucky enough to begin on Apples. After a session with Logo, the kids can then go hike, swim, or play tennis.

Many farms in the region are some distance from service facilities in Napier, so the likelihood of breakdowns had to be minimized. Company head Dave Smith also likes Apple's power supply.

"It's big, and that's important in country areas where the power supply fluctuates," he says. "Some machines crash immediately if there's a power flip, but the Apple is less likely to do that. The power can drop off to the point where the picture disappears from the screen completely, but it comes back. The same goes for the disk drives."

Cows Coming On-Line. This year heralds the introduction of two rural videotex databases. One of these, the Bureau of Primary Information, is based on the UK Prestel standard and can also be accessed by micros.

A pilot system for dairy farmers began in March, while what is claimed as one of the world's most comprehensive veterinary databases comes on-line this month. The scheme was started by Cargill McKenzie and Peter Trim, former senior information staffers at New Zealand's ministry of agriculture and fisheries. Trim is a qualified veterinary surgeon, which may explain the early attention to animal health.

McKenzie admits that micros are ultimately a better way for farmers to go, but says the price puts them off. Videotex terminals cost only $700, and farmers can use them with their television sets.

"You don't convince a farmer to spend $5,000 on something very new or novel very easily," Cargill says. "But if he buys a videotex terminal he may later move upward to a micro, because he'll be familiarizing himself with computer technology."

Eighty-Column March. A small but growing Apple peripherals industry exists in both Australia and New Zealand. The best-known item in the United States is probably Zofarry Enterprises's Vision-80 card, which until the advent of Videx's Ultraterm was generally regarded as the industry standard. A feature of the Vision-80 is its smart terminal emulation communications mode.

Zofarry now has a wider range of products, including eighty-column preboot disks for *Apple Writer II* and *VisiCalc*, 128K and 256K memory expansion cards, and a variety of utility programs.

Buzzing Between Machines. Communications is the computer buzzword everywhere these days. The Australian-designed Netcomm card enables communication between Apples and nearly all IBM mainframes. Apple Computer was impressed and has taken up worldwide marketing rights.

Photo by John MacGibbon

Young campers Logoing at the Te Horo, New Zealand, computer camp. Another camp across the Tasman Sea at Eleanora Heights offers access to surfing beaches.

Pirates on the Software Seas. Software running on Australasian Apples is largely from America. Most applications aren't worth developing locally. The reasons? A small market and the prevalence of software piracy. One Auckland micro retailer claims that more than 90 percent of software running on local Apples is pirated. Microshop, a Wellington retailer, reckons pirate copies account for 20 percent of business use, 40 percent of games use, and 80 percent of education use. Any Australasian hoping to make his pile in the software business had better develop markets overseas or have a cast-iron protection system. With software costing so much, the two countries possess some of the most active and sophisticated Blackbeards south of the Bahamas. Some representative prices illustrate their incentive.

ScreenWriter II is priced at about $125 in the U.S., $195 in Australia, and $275 in New Zealand. Americans pay about $175 for *Multiplan*; in Australia it is $300 and in New Zealand $600. *MasterType* is just under $40 in the United States, $65 in Australia, and $95 in New Zealand. *Choplifter* is about $35 in the United States, $48 in Australia, and $85 in New Zealand. And remember, Aussies and Kiwis buy these programs with lower average wages than U.S. consumers.

Parents would love to buy *Rocky's Boots* for their kids, but must ask themselves "Is it worth $115?" That much money would buy a lot of educational books. But the New Zealand Customs Department rates books (even *Playboy*!) duty-free "cultural" items while slamming computer programs with 27.5 percent duty and 40 percent sales tax.

Strange Fruit. Australians are no more honest than New Zealanders. In fact, the situation there has worsened since a recent decision against Apple in an action against a Melbourne retailer of Taiwanese Wombat copies. As Apple's case was partly based on proprietary programs copied by Wombat, the court decision has thrown the software industry into turmoil.

In January a group calling itself the Public Domain Software Library announced that it would sell cheap copied software. The *Sydney Morning Herald* has advertised the Banana personal computer for $489. This tasty fruit may be garnished with Apple software at "unbelievable prices." Meanwhile, a heavily lobbied Australian Government has promised early legislation, retroactive if necessary, to modernize its copyright laws.

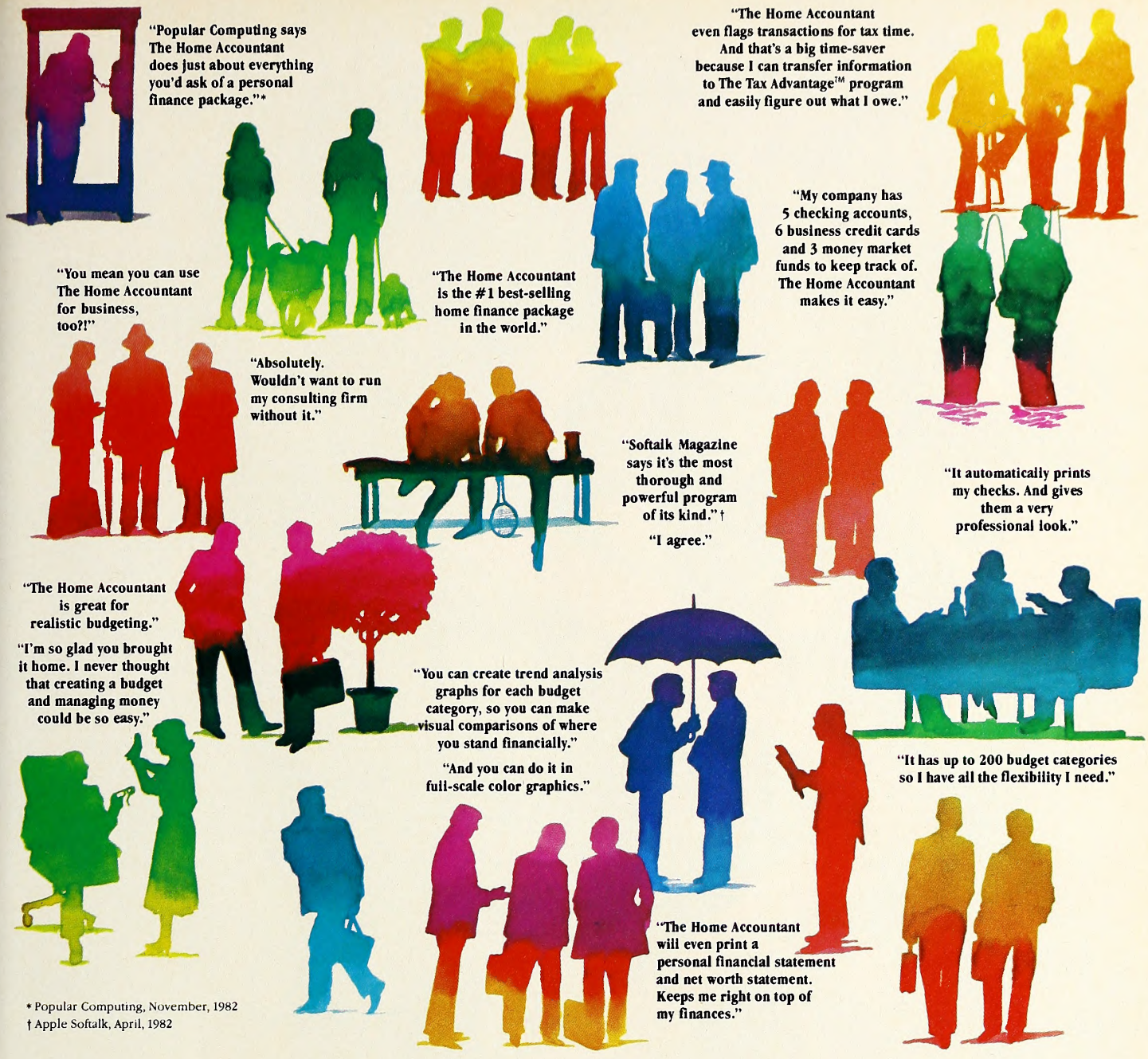
In spite of this difficult environment, good software is being written in both countries, and useful export trade is developing. Advantages often cited by local software developers include high educational standards, lower wage structures, and inventive, lateral-thinking populations. The latter attributes have developed as a result of the two countries' relative isolation from the world, which has often forced them to produce quick homegrown solutions to technical problems.

Particularly attractive is the low cost of sending software to the Northern Hemisphere, compared to freighting of bulky traditional agricultural and mineral exports. Software houses are now actively seeking associations and joint ventures with British, Japanese, and American companies. The most successful of these to date has been in the Burroughs rather than Apple field.

When Burroughs decided to adopt the Logistics Information Network Compiler (LINC) "fourth generation" program development package as its software flagship, it could have transferred the development team lock, stock, and barrel to Detroit. Instead the company let the group remain in Christchurch, New Zealand, and the product has since become a substantial export earner.

Communicating with the Burroughs head office is no problem with air freight and electronic mail, and LINC inventors Peter Hoskins and Gil Simpson think they work better in their own country's less hurried environment. In three years Burroughs has invested nearly $9 million in LINC development, and Hoskins expects an equal sum will come his way in the next three years. It's been a good investment: The LINC people won't say how much the product has earned, but other sources estimate total international sales in the past two years at around eighty million U.S. dollars.

How nice it would be if, alongside each of their dairy factories or wool stores, New Zealand and Australia could have a software house earning that kind of money! It is little wonder that phrases such as "sunrise industries" and "high-tech future" have suddenly become so trendy among down under politicians of all persuasions.



* Popular Computing, November, 1982
† Apple Softalk, April, 1982

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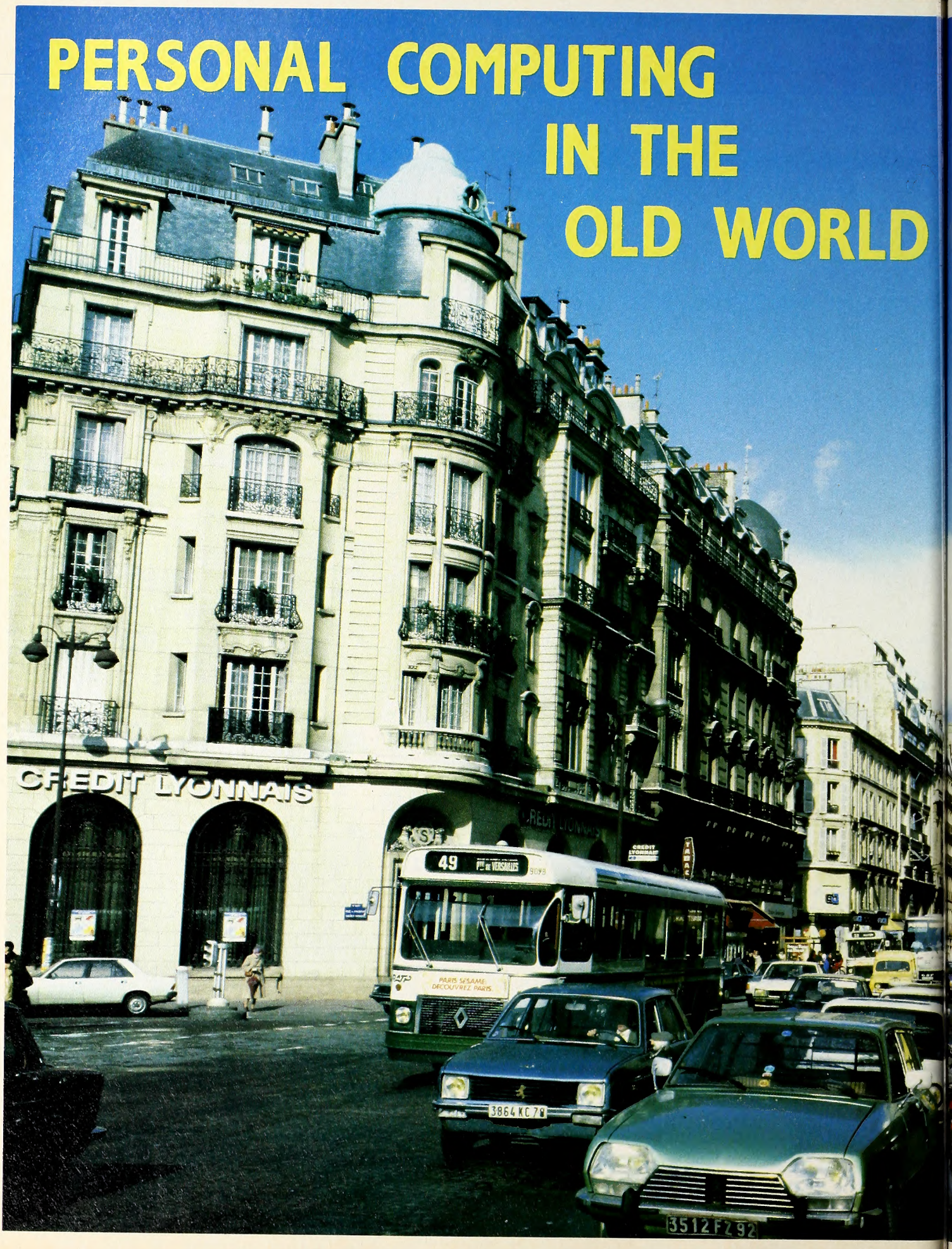


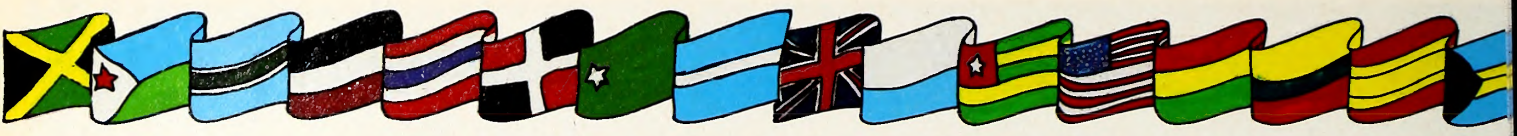
BY DAVID HUNTER

Extremely individualistic and infinitely more patient, Europeans live life at a slower pace than people in the United States. They believe that Americans only see the beginning and the end, never the middle. The histories of some countries are not counted by century but by millenia.

Europeans may be slower to embrace, and excel at, personal computing than other people in the world. But this is not due to backwardness, laziness, snobbishness, and slowness—meaning lack of intellectual wherewithal.

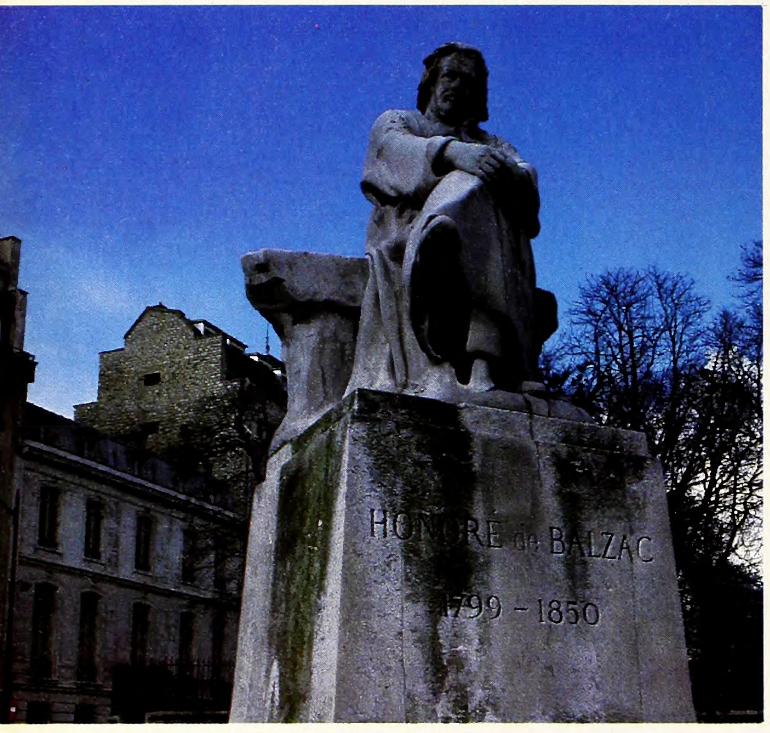
If anything explains their slower pace, it's that Europeans are too practical, too cautious, too conservative, and too intellectual. They are not without shortcomings, but these are the strengths that keep Europe standing tall in even the shakiest of times. Not rushing headlong into a volatile market like the worldwide computer industry is hardly due to lack of initiative. Let's not forget that it was European scientists and researchers who supplied the basic knowledge needed to create computers. Let's not forget that America is a melting pot and that Steve Wozniak was not bred of generations of drawling Texans.

Emerging Europeans. On a person-to-person basis, most Europeans are not as gung-ho about personal computers as Americans. In France, though, this is changing. In England, it depends



on your definition of a personal computer. Below the six-hundred-dollar price range, so-called personal computers are quite popular. In England, there's this homegrown Nolan Bushnell-like guy named Clive Sinclair who has sold hundreds of thousands of his ZX-80 and ZX-81 home computers.

Commodore computers are fairly popular in some countries because they sell for less than $300. The price factor, far more than the concept, has kept true personal computing from really taking off there. In fact, it's not all that different than it was in the United States a few years ago. But pricing is not the only inhibiting factor, just the most obvious one.



People in Europe are not the impulsive buyers Americans are. They ask over and over again, "What will this thing do for me?" Again, there is a certain similarity to the situation in the United States. American consumers have gobbled up ten million or so cheap computers with which they can play *Pac-Man*. But Apple has only sold a million and a half personal computers.

When you add to the basic conservative European attitude toward new technology the fact that good software is often difficult to find, it's not surprising that personal computing in Europe is just now growing up. "Personal" software is practically nonexistent. Europeans on the whole do not share Americans' love of arcade, strategy, adventure, and fantasy role-playing games. Up until last year, the vast majority of Apples were used in business—for accounting, managing inventories, forecasting, word processing, and the like.

But the situation appears to be changing. In Europe, 1983 was a very good year for Apple. Dealers now number around fifteen hundred in the twenty-one countries Apple considers its European market—the United Kingdom, West Germany, France, the Netherlands, Italy, Austria, Belgium, Sweden, Cyprus, Spain, Denmark, Finland, Greece, Iceland, Israel, Malta, Norway, Portugal, Switzerland, Turkey, and Yugoslavia.

The folks at Apple Computer International, Apple's strategic center for European marketing and sales located just outside Paris, say that Europe tends to fall into north and south regions characterized by the culture and mentality of the inhabitants. Generally speaking, countries like France and Italy have been faster to accept the personal computer phenomenon because the people's personalities are lighter, more creative, with even a certain sense of playful craziness, whereas the northern peoples, such as those in England and West Germany, approach the whole thing more logically.

The major European countries for Apple are England, France, Italy, and West Germany, with the rest lumped together in a category known as the General European Area. This is not to say that other countries are not as important, but Sweden, for instance, has sales numbering only a few thousand. A country like France, meanwhile, is fast becoming a major market.

The key for Apple, and for personal computing in general, is to localize the product so that it appeals to a specific country's consumers. Localization is a term that applies to the design of the machine itself—such as the keyboard, character set EPROMs, and video interface. For instance, most European languages have different ways of writing quotation marks, monetary symbols, and accent marks; many also have additional letters in the alphabets. Localization also refers to the process software must go through before it can appeal to any but those who understand English.

Interpretive EuroApples. Localization, however, involves much more than just changing English into German and reconfiguring keyboards. The way software is structured and the way it performs are subject to a wide range of conditions throughout Europe. Similarly, the way Apples are marketed and supported is different from country to country. The real trick is to walk the thin line of localizing a product for each country but not losing the overall consistency that makes an Apple recognizable whether it's in the hands of a user in Marseille, Osaka, or Fort Worth.

The problem of importing good software from the States is being solved slowly but surely. Apple itself is localizing most of its popular packages, including *Apple Writer*, *III E-Z Pieces*, *AppleWorks*, Basic, Logo, Pascal, and more. Some of the large American firms are also taking an active interest in marketing their software in Europe. Among these are Microsoft, Lotus, and Sir-tech.

Still, the root of the software problem lies in European soil. There just hasn't been enough good local software—the kind the Europeans would know best how to create—to generate interest in personal computing. A flood of entrepreneur-founded software firms hasn't swept this region as it has the United States.

One way Apple is helping to change this situation is by encouraging European companies to market their software in the United States and other foreign countries. If Apple is metaphorically in the record player business, then the company is doing its best to help people make records that play on its machines. And, like in the record business, it's crucial that software appeal to a population's culture rather than only to its intellect. Apple software must become more than just another American anomaly. It must become part of the European value system. The best way for Apple to do this is to show Europeans how to create their own software instead of leaving them to use refurbished American wares.

One important area is education, and Apples are finding their way into European schools in increasing numbers. Apple has a Kids Can't Wait-type program in most countries. In France the program is called The Future Can't Wait and last year Apple sold ten thousand IIe's to French schools. In England, Apple has a lot

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of competition from the Acorn, a locally produced machine. Price, again, is something of a barrier, preventing widespread use of personal computers in education in Europe.

EuroMacs on the Move. A plan similar to Apple's stateside University Consortium program with Macintosh is being considered. But higher education in Europe is much different than in the United States. Getting universities to agree to buy $2 million worth of merchandise, produce software, and then share that software will be a tricky business. Apple is convinced, though, that Europeans can only gain from such a program. Putting Macintosh technology into the hands of eager students is intended to encourage a homegrown software industry.

In terms of add-on hardware and peripherals, there's a growing number of companies offering such high-end items as joysticks and paddles. And a few manufacturers are bringing out hard disks. But in hardware, as everywhere, the practicality of most Europeans is evident. There is no reason, for instance, for a company to introduce a new Z-80 card when Microsoft already offers one. The same logic applies to monitors and printers.

Currently, only a very small fraction of Europeans work out of their homes with personal computers. Resistance to this trend stems from the same attitudes that can be found in the United States: Many people just plain like going somewhere to work. The facts that most employers don't trust their workers and that most employees are fond of interacting with their fellows are keeping the so-called electronic cottage from catching on in Europe and the United States.

On the other hand, there are practical reasons why working at home may one day be mandatory for some Europeans. Cities such as Paris and London are so choked with automobile traffic that the mechanics of moving people in and out each day is becoming a major concern. And the time people spend in automobiles, or on buses and trains, is essentially wasted.

People will tend to work at home when the infrastructure allows them to—when there are less expensive communications and a deliberate democratization of business practices. Employers have to realize that it doesn't always matter where people reside while they work. What counts is the result of the work. People can be paid according to their productivity, not just according to attendance.

The Videotex Challenge. One potential threat to personal computing in Europe is videotex, a system whereby graphics and text are sent to dumb terminals in homes via telephone lines. Both France and England have burgeoning videotex services and are years ahead of the United States in this promising technology. In France, for instance, videotex is replacing the need for a telephone directory service. Using a small terminal with a full keyboard and screen, Parisians can get information faster and more efficiently by searching through directories than by talking over the phone. Many other information services are available, but, since the terminals only receive information, videotex is by no means comparable to personal computing.

Still, videotex is continuing to evolve. There is the possibility of two-way videotex becoming affordable and practical sometime this century. There is also the possibility that manufacturers could include video recorders, television sets, stereos, and personal computers in one big package. These mass marketing approaches to personal computing are more a challenge than a threat to companies like Apple. Videotex is roughly akin to a state-issued bicycle, and a TV/stereo/pc is an expensive RV. Personal computers are private cars, ranging in price and performance from inexpensive Volkswagens to BMWs and Mercedeses.

The speed of penetration of new technology in Europe, according to some, is traditionally slow at first. Whether it be computers, stereos, or videotape players, a foreign company can expect about 10 percent of its sales to come from Europe until the technology matures. But once this happens, Europe may account for more than 50 percent of sales.

The total GNP for Europe is roughly equal to that of the United States. And the size of the overall population of Europe is probably a little more than that of the States. At some point the European market is likely to equal or even surpass the U.S. market.

American companies have to foster a two-way situation, a more balanced trade with Europe. There are practical reasons for this approach, but the motives need not be limited to increasing profits alone.

Life Goes On. Last month in a special cover story, *Newsweek* painted a not-so-pretty picture of Europe. In most countries high unemployment is a problem. European industries are struggling because of both the current economic slump and increased foreign competition. Cooperation between the various countries seems to be at a low point; both the EEC (European Economic Community) and NATO alliances are in trouble.

Relations between the United States and some European countries are strained. Our foreign policy is met with expressions of approval or with angry scowls. Likewise, American companies that set up shop on European soil are sometimes welcomed and sometimes given the cold shoulder.

When approaching the subject of personal computing in the Old World, it's impossible to ignore the overall bad news from Europe, but the generally bleak picture that's painted by the mass media is sometimes a less than accurate representation of what's going on. The media has jumped on the "Decline of Europe" bandwagon, just as it has heralded the arrival of the personal computer industry shakeout. Another point of view is that Europe is just going through one of its periodic economic slumps and the American computer industry is just shaking off the slaggards and bunglers.

Okay. You ask, "On a personal level, what about the one out of every ten Europeans who is out of work? What about all those workers that Coleco just laid off?" Without question these are tragedies on a personal level. But to make the blanket statements that IBM, with its multi-billion-dollar guns, is going to sink Apple, and that America and "Japan Inc." are going to collectively sink Europe, is to ignore both the lessons of history and the reality that surrounds us.

Apple's European Family Ties. In the late seventies, a hardy group of pioneers took their relatively primitive Apple II and II Plus computers and started an industry that is still growing, still contributing wonderful things to life here in the United States. The Artwicks, Budges, Bricklins, Clardys, Williamses, Carlstons, Pelczarskis, Kapors, Woodheads, Greenbergs, and Wagners have climbed to great heights and still haven't reached the top of the software world.

Can you imagine what those pioneers could have accomplished had they started with Macs, IIe's, IIc's, and Lisas? Well, get ready. The Europeans are getting into stride, and they have the benefit of years of Apple's march forward in hardware design. Expect to see some great software coming from over there in the next few years. Expect to see software with a touch of English manners, French *joie de vivre*, and Italian spice. ■

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BRADY

The Mercedes of Personal Computers

BY EDEN RECOR

Apples play a role in a variety of applications in Germany. In southwest Germany they're pressed and made into apple wine. The Sachsenhausen section of Frankfurt is well known for this wine, as many American tourists can attest. Apples are also an essential ingredient of a fine pastry called Apfelstrudel. However, there's another kind of Apple that interests Germans, and it's made by Apple Computer.

Approximately sixty thousand Apple computers exist in Germany. Of these, only about 5 percent are found in the home. Also, Apples aren't found in schools here as often as in America. Instead, they're being used in small businesses and by professionals such as lawyers and doctors.

Give Me a Home Where the Apfelstrudels Roam. Up until last year, Apple computers were sold by distributors in this country. The first distributor was a Hamburg-based company called Basis. The firm started distributing Apples about two years after the Commodore started selling in Germany. Then Basis decided to build its own computer that, amazingly enough, happens to run Apple software. Another company, Apple Computer Marketing, then took over the distribution of the Apple, with Basis still maintaining some distribution rights.

About a year ago, Apple Computer began consolidating its European operations and bought out several distributors. This brought European operations under Apple International, headquartered in Paris. German distribution is now handled by Apple Computer Marketing GMBH, with basic prices and strategies fixed in Paris.

Another reason for Apple's poor showing in the home is cost. During the early years, Apples cost more in this country than they did in America. In Germany, it often takes $100,000 collateral to get a loan of $40,000. Credit cards are almost unknown except in shops catering to tourists. Home loans normally are for ten-year periods and have correspondingly higher monthly payments. These higher loan payments reduce the amount of income that can be spent on nonessential goods. This means that consumers here have to save cash before purchasing a car, television, or computer.

A few years ago, the money that could be saved by going to the United States on vacation and picking up an Apple would pay plants in Cork, Ireland, and since Apple International's takeover of the German market, Apple prices have been kept on a par with those in America, making them more affordable products.

Culture Shock. Americans can be characterized as people who will first buy a computer, then ask, "Okay, what can it do for me?" and then go on to find all sorts of uses for it. That attitude doesn't exist in Germany. A German will first ask, "What will it do for me?" and then someone will have to convince him before he buys. American dealers, used to people dropping in who already want a computer, don't have to do the same kind of sales job on people that German dealers do.

As a result, the dealer network in Germany is set up to handle professional users, which probably explains why about one in ten Apples sold here is an Apple III. A survey of dealers reveals that many of them are not sure that there's a use for a computer in the home. One German attitude is that a computer is for work—and who wants to do work at home? Many feel that having a computer pens you up inside the house and somehow corrupts you, making you forget about other aspects of life. They prefer using their spare time for gardening, engaging in sports, visiting friends, and going for walks. The country is not as dependent on television as America is, and this attitude carries over to computers.

In America, exposure to computers in the school has brought them into many homes. This hasn't occurred in Germany. Until recently, the branch of the German government that controls education had held the position that if school funds were to be spent on computers, then Commodore machines must be purchased. Most German kids exposed to Commodores have said that they are great game machines but that they would really like to have a computer like the Apple in school. Students with Commodores at home because of the cost say their next computer will be an Apple. The computers they have used are viewed as game machines, and why spend a lot of money to play games?

The situation in the schools may be changing soon. The government is considering legislation to allow computers to be donated to schools for tax write-offs similar to the Apple Computer donation program in California. The government may also be relaxing the restrictions within which computers may be purchased by a school.

This summer, a German-language version of Logo should be available for the Apple II. Apple is finally being recognized as having a machine with much to offer higher-grade German schools. However, there still won't be much happening in the grade schools because computers are not recognized as having any use there.

Sports Model or Sedan? An emerging overall awareness of the personal computer may be changing the situation throughout the country. One recent Sunday afternoon, a two-hour program on the use of computers in the home gave a very good European viewpoint on all the different aspects of home computing. Apple Computer was heavily featured. Also, three times in the last month a program called *Kinder vom Apple und Atari* (*Kids of the Apple and Atari*) ran on German television. In addition, major magazines are now starting to notice personal computers and run articles on them.

Many people here have been waiting for higher technology and don't want to risk buying an earlier-generation computer that may quickly become obsolete. With Apple's introduction of the Macintosh, the company will probably convince many that an advanced technology has arrived, one that won't leave them behind. Apple is considered the Mercedes of personal computers in Germany; a German consumer will save money a long time to buy one because, as it is in the car, the quality is recognized.

Probably the one event that will most affect home and school use of the Apple is the introduction of the IIc. This new machine, with its current Apple software compatibility, German keyboard, low cost, and well-engineered layout, is sure to drive Apple directly into schools and homes. Sold through department stores, the IIc will bring computers into the sight and reach of many families that wouldn't normally visit an authorized dealer. At the same time, businesses will also be considering the other Apple machines—Mac and Lisa—for those applications where Apples were not even thought of before.

There's No *Mischa*s like Soft *Mischa*s. Apples in Germany are now used mostly in professional situations. Most programs running on the machines are written in Pascal, originally defined in Switzerland and very quickly accepted in European universities. Most students studying programming learn it, and most software houses write exclusively in the language.

Several powerful accounting packages for the II have been available here for the last three years. Versions have also been transferred to the III to take advantage of the extra memory and capabilities of that machine. Two powerful relational databases, called *Aladdin* and *Beta*, are also available for the two computers, bringing them mainframe and mini power. In addition, a Lisa-like database interface called *Fred* has been developed for the III that uses a joystick, and a mouse version will soon follow. All three packages will soon be available stateside, and the companies that have developed them—Adi and Bensa—will be working on Mac and Lisa versions.

Many American software companies such as Microsoft, MicroPro, and VisiCorp are beginning to bring their software to Europe as German products—all three now have German offices or distributors. All of Quark's products are being translated into German and distributed in Germany, Switzerland, and Austria.

Translating software into a foreign language is a long and difficult job. Many manuals written for U.S. programs can't be directly translated and often require complete rewrites, especially of tutorials and examples. German is more difficult than English in that many of the technical terms require longer words (compound nouns) than in English. Sentence structure is also different with regard to the location of verbs in German. Often there's no standard technical term that makes sense in precisely the way it does in English. Consequently, programs require more coding area and can overflow memory.

A program such as *VisiCalc*, which uses a command structure based on spoken English, is a good example of another problem. A P for print means little to a German-speaking person, since the counterpart word in German doesn't start with the same character. In German, D for *drucken* would be a better print command. Some programs intertwine commands into the programming code so well that it's difficult to find and change them easily in a translation job.

Better than Esperanto. Apple now makes its machines internationally compatible. Starting with the III, all Apple products come with keyboards, character sets, and power supplies for the country in which they're sold. Lisa and Macintosh software development kits contain tools that help developers convert to foreign languages, and Apple publishes guidelines on how to write programs that can be easily translated.

Photo by Joseph Permetti/Peace Corps

The meandering Main River is a tributary of the Rhine, which rises in Switzerland and flows west across Germany and the Netherlands to the North Sea. The famous river is navigable by smaller vessels as far as Cologne.

It took special planning by Apple International to ensure that the Mac would be 50/60 Hz-compatible. As a result of these efforts, Apple can now announce a machine around the world on the same day, something few other companies can do.

Quite a few German business clients are "computer-shy," the way most Americans were a few years ago. They fear they'll hurt something when they get an error message and immediately freeze up. A lot less familiar with their systems than their American counterparts, they call their dealers for help.

Many Apple dealers in Germany are also software developers, functioning more in the role of consultants than U.S. dealers. In many cases they design a system to meet a customer's needs,

Photo by Joseph Permetti/Peace Corps

The Bavarian Alps overlook Apple's central Europe sales and marketing offices in Munich. Extensively bombed during World War II, the city was the birthplace of Adolf Hitler's National Socialist German Workers Party.

Photo by Jan-Peter Flack

Life seems barely changed—except for computers—on a small rural farm in Germany. One-third of West Germany is devoted to agriculture.

install it, and continue to give plenty of postsale support. Since they are dealing with professional buyers, they charge extra for this kind of support.

Apple Computer held its first developers conference in Germany last October, the first exposure many software houses had to Apple's third-party software development efforts. Attendees were surprised at how much Apple can give in the way of preliminary software programming tools and marketing help. Another conference is scheduled this month.

A lot of software being developed and used in this country is what's known as vertical market software—specialized packages for a specific use. Many software houses develop programs for a small market segment and then make their living customizing it for each buyer.

Among the more interesting German vertical market programs are *Baeckeri* (with three companies using the same name) and *Back*. These programs do bakery management, everything from entering orders as they are taken over the telephone and handling billing, to determining baking schedules and planning delivery routes. *Kabel* is for electric wiring installation and does cost estimating, calculation of parts, inventory control, and contract writing. *Fasu* is a driving school management package (in Germany, everyone must attend driving school to get a driver's license). *Mika*, *Mischa*, and *Mipreis* are for the production of windows (for homes and offices, not for Lisas). *Jewela* is designed for jewelers, who use it to keep track of their inventory.

The Auge of Members Is upon You. There's one large Apple users group—A.U.G.E. (Apple User's Group Europe)—that has most of its members in Germany. Currently, members number about four thousand, 80 percent of whom are home/hobby-oriented. About half of them own Apples, while the other half own compatibles of one type or another. Some members have even built their own Apples. A.U.G.E. (*Auge* means eye in German) consists of forty-five different groups throughout the continent; other local chapters exist in Switzerland, Luxembourg, Norway, Yugoslavia, and Hungary.

The president of A.U.G.E., Klaus Schmidt, believes that the Macintosh is reawakening interest in Apple computers and may bring members back from the various compatibles they've purchased. So far, the group has released about thirty public-domain disks of various programs. Their address is Postfach 110169, 4200 Oberhausen 11, West Germany.

A *WordStar* Topping Every Tree. Once users have purchased programs in Germany, it's very unlikely that anyone is going to come after them for violating a copy protection regulation if they give copies to all their friends. That's not viewed as being in violation of any copyright laws, unless the disk is actually sold.

Among developers, there's a reluctance to develop any programs such as games or educational software for the masses. Most feel that they won't have large enough sales to warrant bringing such software to the market. Most home/hobby users with Apples also have CP/M cards, or something similar, and possess copies of *WordStar* and *dBase II*, given to them by friends. Thus, it's little wonder that copy protection is on developers' minds when they bring out new packages in this country. If anything, widespread copying is one of the most inhibiting factors to wider software development in Germany.

As part of a Christmas promotion, Apple included a game with each IIe sold. This game was a well-written adventure—said to be the first written in German—that takes several weeks to complete. However, several recipients of the bonus game were surprised when its authors offered it to a dealer for commercial distribution. They felt that a game should be free!

The Armed Forces March on Their Software. There are about six hundred thousand Americans associated with the U.S. armed forces stationed in Germany. A couple of years ago, when Apple in Cupertino discontinued all mail order sales to the country, these Americans were abandoned. If they went to German computer dealers, there were often language problems, and the dealers couldn't help them much in terms of software. And if they had friends purchase computers for them stateside and ship them, they were without warranty service. The problem of adapting to European voltages also has to be considered.

This situation has started to change, with four military exchange computer stores now carrying Apple products. There are computer clubs forming at large bases, and there are several original equipment manufacturers selling to Americans. Also, many German dealers are beginning to recognize that Americans are very good customers and are giving them better support.

Buying a machine in Germany has several advantages. All Apple products purchased here have a one-year warranty while they remain in the country, with easy conversion from 110-volt to 220-volt use. German IIe's also have a keyboard with both German and English keycaps. A flick of a switch brings up the desired keyboard and font—an advantage for children who are learning German.

Apples Are Looking More Delicious. Apple Computer is starting to take off in Germany. The company currently has seventy-five busy employees there—almost double the number it had a year ago. This April, Apple moved to new offices in Munich, a sure sign of growth. At the Hanover Fair, the world's largest trade fair (with everything from trains to micros), Apple had its largest booth ever, including thirty-five debuting Macintoshes for use by fair attendees.

Perhaps one of the happiest things to occur in Germany this year is the country's first Applefest, which will take place in Munich this summer. Who knows—maybe in a few years the Applefest will match the Oktoberfest in popularity. ■

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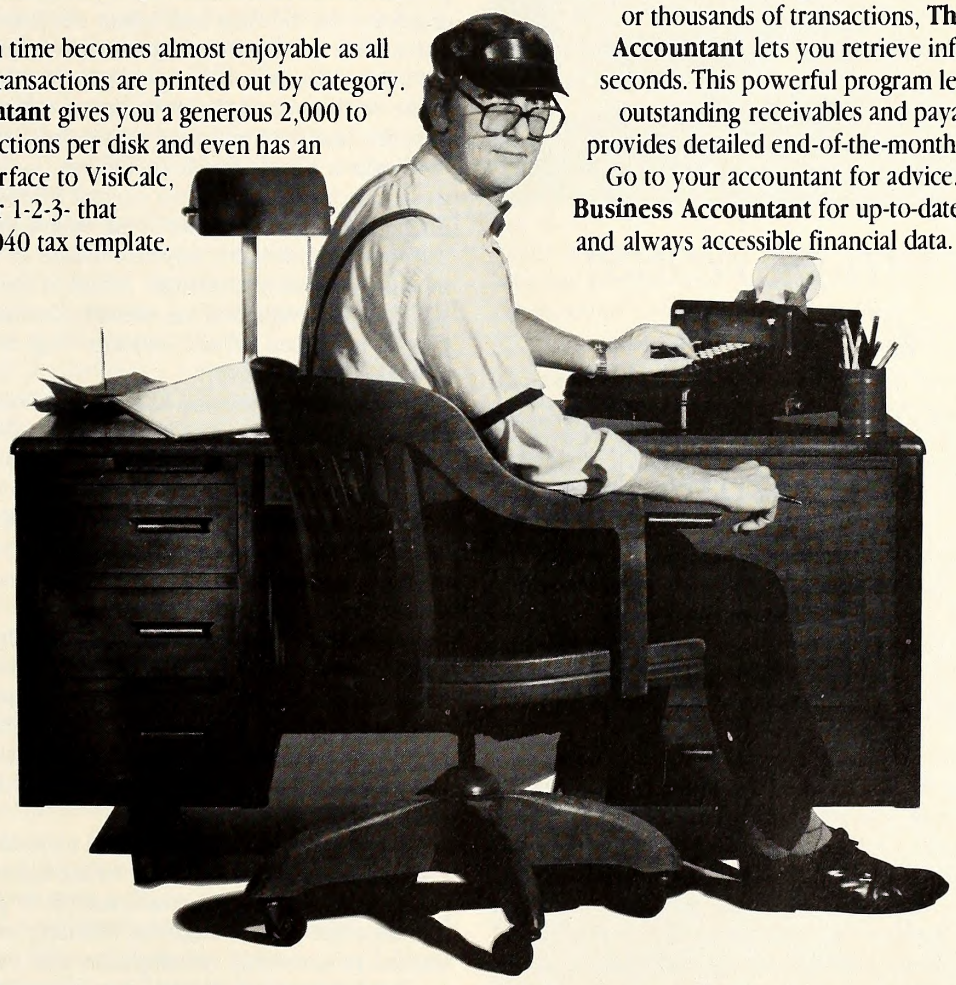

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The Problem of Wheat

BY ANDREW CHRISTIE

Mankind has never before had such ample technical and financial resources for coping with hunger and poverty. The immense task can be tackled once the necessary collective will is mobilized. What is necessary can be done, and must be done.

—North-South: A Program For Survival,

The Brandt Commission, 1980

On the first day of 1984, the government of Tunisia made a mistake. It removed the agricultural subsidy that had kept a small loaf of bread priced at about seven cents for the last twenty years. This error increased the price of grain products 100 percent overnight.

A wave of demonstrations, beginning among the poorest people in the arid southern rural provinces, swept northward through the unemployed and underemployed—a fourth of the country's population—and rocked the capital city of Tunis. President Habib Bourguiba proclaimed a state of national emergency; tanks rumbled through the streets; soldiers and police killed some forty-five rioters in Tunis and sixty more in the provinces. Finally, six days later, Bourguiba announced that prices would be returned to their previous levels immediately, and, just as immediately, calm was restored.

The price hike turned out to be a bad idea. But no bad idea is that simple, according to Charles K. Mann, associate director of agriculture and social sciences for the Rockefeller Foundation. "When the proposal to drop the subsidy completely was presented to the minister of national economy, he asked his staff, 'What would be the financial impact of reducing the subsidy by about 20 percent instead of dropping it altogether?' " says Mann.

"They advised him that it would take several days to do these calculations. As a decision was required immediately on the budget, they went forward with the alternative that had been costed out—that of dropping the bread subsidy entirely. Had they had a *VisiCalc* model, they could have calculated in a matter of minutes the effect of a 20 percent reduction in the subsidy."

Had computers been involved in the economic ministry's decision to cut off the bread subsidy, a less drastic change in the bread price might have resulted and the food riots might have been averted.

"That is the kind of analytical capacity the policymakers [in Tunisia] want," says Mann, "and it is what computers have helped them get in the Ministry of Agriculture."

Those computers are Apples, and how they got there is an adventure in foreign affairs. What the Tunisians had to say about them was "Fantastic!"

This year, famine is looming over Africa again. The African problem of chronic hunger is deeply rooted, going back to the policies of the nineteenth-century colonial governments and their emphasis on industry and urban development at the expense of agriculture and basic food production. Ironically, the tool that is the most salient symbol of postindustrial high technology has now come to the aid of the developing nations in the fight against hunger—and they will need all the help they can get.

From a Single Seed. In Tunisia, as in many developing nations, much depends on the current disposition of the grain crop. Since it dominates the diet of the people and is the main source of calories and nutrients, any fluctuation in the price or availability of bread is a serious matter. Africa is the only area of the world where food production has actually declined in the last ten years, despite increased aid and concern—and in tandem with a steadily increasing population.

That's why, when the Rockefeller Foundation organized a review of cereal production and policy in 1980, the foundation took an interest in Tunisia's agricultural fortunes, seriously flagging since the late seventies.

Charles Mann was part of the team that put Apples in Tunisia's Ministry of Agriculture. He has considerable experience with the governments of developing nations, the problem of wheat, and Apple computers.

"There is," says Mann, "broad recognition that many of the Third World's hunger problems don't stem from a lack of technology to produce more food, but from poor management—public and private—and government policies that discourage food production. The foundation is working with several Third World nations to help them overcome these barriers to higher food production and consumption."

When the foundation launched its food and agricultural policy project, the expertise of Chris Mock made her the woman for the job. She had done extensive research on grain distribution, knew the structure of the Tunisian Ministry of Agriculture, and was trained in economic development and management. Mock first worked in Tunisia in 1974 as a consultant for the U.S. Agency for International Development (AID) and the World Bank. She came to the agricultural sciences division of the Rockefeller Foundation in 1978, and, at her suggestion, Tunisia was included in the cereal review project.

Mock arrived in Tunis in June 1980 for a series of study planning sessions with Badr Ben Amar, head of planning for cereals and economic analysis for the Ministry, and various members of the Tunisian Commission Centrale and the National Institute of Agronomy (INAT). Quite apart from the cereal project, her primary observation was that the Tunisian analysts were spending too much time doing routine spreadsheet analysis and projections. Also, they had no rapid information feedback system that could let them know if they were meeting their objectives in the crucial areas of fertilizer and herbicide deliveries.

Mock reported to Charles Mann on the frustration and drudgery that plagued workers in the Ministry of Agriculture and in the county extension offices where they were doing the work of a computer with pencil and paper. At her urging, project funds were directed toward the purchase of a dozen programmable calculators for the Ministry's Office of Planning, and two desk calculators for every county office in Tunisia.

"Although work at the lower levels was speeded up substantially," says Mann, "at the higher levels the appetite for a microcomputer system was whetted rather than satisfied by the calculators."

The need was clear, and Mann could relate. In his case, he had been converted to the joys of micros by experiencing the trials of mainframe computer time-sharing in Turkey in 1976, when political upheaval blocked the access of his field study group to the Middle East University's IBM 370. The computer center's staff was suddenly replaced with personnel more politically acceptable to the new regime but somewhat lacking in knowledge of computers. It was two years before the study's data could be input to the computer.

Mann's work with the data involved "counting manually on our dining room table the responses to several of the questions on the survey forms. While this is one way to get a good feel for individual farmer responses, it creates a certain predisposition to view warmly the advent of the microcomputer."

While investigating the project's request for a microcomputer, Mann discovered that the USDA was operating two Northstar Horizon micros in the Office of Statistics, one floor below the planning office in the Ministry. However, they were dedicated solely to the processing of their survey data and had no spare capacity for other projects. Even if there had been a possibility of time-sharing, Mann points out, it would have been something of a moot point.

"In the early months of this installation, apparently the Tunisians had considerable difficulty in getting the Northstars to run properly. It was an imposing-looking installation," he explains. "I don't believe it ever crossed Ben Amar's mind that he could actually sit down at this computer and run programs—if you needed something done and it involved a computer, you took it to some programmer and he did it. This clearly was handled as a computer center–type installation where the only persons allowed to approach the machine were those trained in its use.

"On one visit, we could not even locate anyone who could physically unlock the door even to let us look at the machines."

Nevertheless, there were Northstar microcomputers already in Tunisia. Should the Office of Planning have its own? Mann consulted with a colleague who used two of them in business.

"After telling me what absolutely marvelous machines they were, he concluded by saying that if he were in my position, and despite the Northstar's technical superiority, he would recommend Apples. In his words, 'They are ubiquitous; they are approachable; they have a reputation for excellent reliability, and there is a far larger software universe available for them.' "

In September 1981 a reluctant Rockefeller Foundation—which wanted hard numbers on the computers' uses and expected results—agreed to ship the Tunisians two complete Apple systems. The cereal review project was scheduled to end in December, so Mann planned a package that he hoped would offer the best possible chance for success in the meager period of time available. He placed the greatest emphasis in four areas.

"First, that we build into the system a great deal of redundancy so that the failure of any one component would not put the whole system down; second, that the software be well proven and include a variety of packages to handle common office and analytical tasks; third, that there be an excellent training component; and fourth, that the senior managers as well as the technicians have hands-on experience with the system so that they would understand the variety of tasks that it could do."

Everything was set. System specialists John and Barbara McMullen agreed to design, assemble, and test an appropriate hardware/software configuration, and to make periodic trips to Tunisia to help in getting various applications up and running and to bring in any needed replacement parts—the nearest Apple service facilities then were in Egypt and Europe.

At the last moment, the foundation turned down the request for funding for the training portion of the program.

Immediately, Mann turned to independent video producer Martha Stuart and offered to pay out of his own pocket to put together some instructional videotapes that would at least provide some kind of training for new microcomputer users. She agreed. The five videotapes, now known commercially as the Powersharing series, featured the McMullens chatting informally with Mann and others on the uses of the Apple II and were included with the system—two Apple II Plus computers and a selection of commercial software—when it finally arrived in Tunis at the Ministry of Agriculture's Office of Planning in February 1982.

The cereal policy and production review had been over for

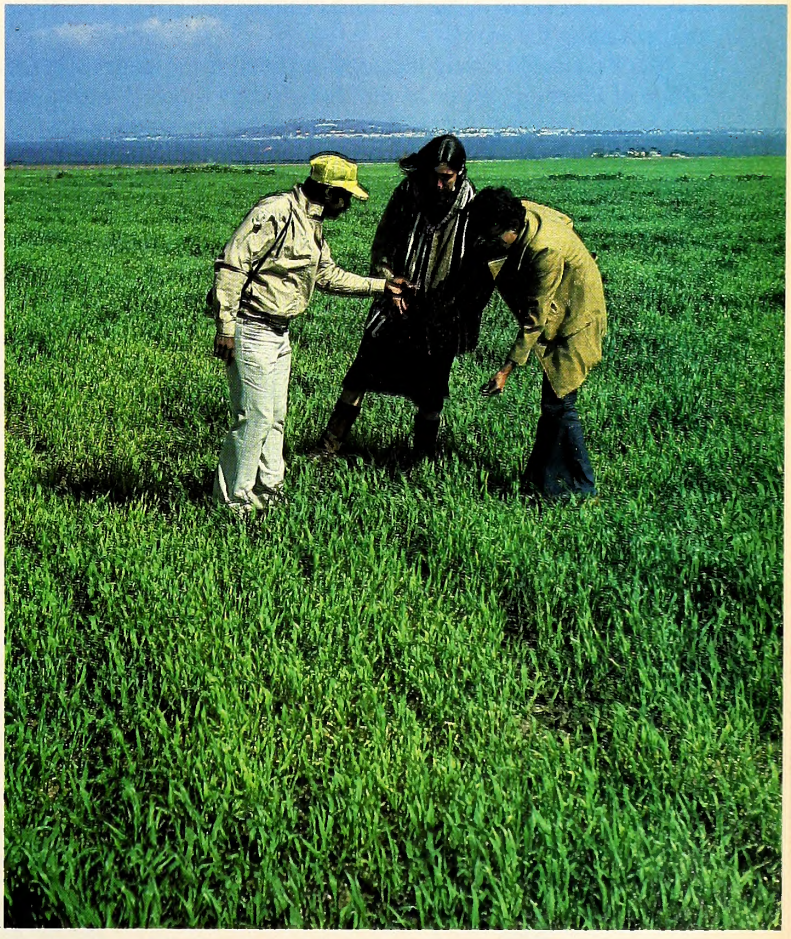

photo: Charles K. Mann

George Varughese (yellow hat), CIMMYT plant scientist, points out signs of soil nutrient deficiency in young wheat plants to Chris Mock and Tunisian planner Badr Ben Amar.

two months. There would be no more funds from the foundation. Between themselves, Chris Mock and Charles Mann agreed to continue without pay to help the Tunisians get their Apples up and running and learn how to use the dozen or so programs sent with them.

How To Grow a User Group. Meanwhile, Chris Mock had made a discovery: There was an Apple installation in Kasserine, in central Tunisia, four hours from the Ministry by car. A rural development project was using the Apple to assist in a baseline survey, doing complex statistical analysis tasks involving a large number of variables. Two Cornell sociologists had invested about two thousand hours in creating the software and setting up technical training. The end results, however, resembled those of the Northstar installation in Tunis.

"The reports of others suggest that the project functioned effectively during the times when the expatriate consultants were there," Mann recalls, "but that not much happened when they were gone. To the extent that the equipment was used, it was used for such things as managing the payroll rather than the intended analytical purpose."

The Rockefeller project did not have the time or the money for software development or system training, but that may have helped them avoid the fate of the other Tunisian computer installations. Just as the tightness of funds had proved the inspiration behind the Powersharing tapes, it now caused a minirestaging in North Africa of the original American Apple phenomenon—the first users of the machines finding out about each other and spreading the word.

Mock arranged a field trip to Kasserine for the analysts in the Office of Planning. "One of the ideas," says Mock, "was to set up a sort of informal user group, at least so they could help each other with repairs or lend each other equipment. You can't buy equipment in-country; whatever you budgeted for to begin with, that's what you were stuck with. And we had a very small budget.

"We had the technician in charge of the Kasserine machine show us all that he knew. We spent a couple of days down there; a really inexpensive way of getting hands-on experience. Once they saw how to operate it physically, they were able to figure out most of the rest. Some of them didn't speak English and there were no materials in French at the time, but they were still able to figure it out. It was like a game; it really did seduce them into sitting down and doing a higher grade of work. There was this incredible, active, energetic interest in this—almost to the point of competition—that I'd never seen before."

"Their original ambitions were quite limited," recalls Mann. "They foresaw principally converting existing pencil and paper spreadsheet work to mechanized processes. In fact, what has happened is that the computer has stretched their analytical ambitions.

"For example, as Ben Amar began to work with *VisiCalc*, it occurred to him that he could use the row and column framework to list all the [Sixth Five-Year] Plan's nonquantified objectives. He has a column for each year within the period, in which he can briefly summarize progress toward the objective of each row. On this one sheet, he said, 'I can see what is happening with the whole Plan. It's fantastic; with the computer you can do anything . . . *anything*!'"

Chris Mock's work was inspired partly by the activities of international groups like CIMMYT, the international wheat and corn agricultural research group in Mexico, which has developed its own software for various analytical purposes.

"That was one of the reasons we thought it would be good to have the Apples in the Ministry," says Mock. "They could share by mail with the other organizations, sort of like an international user group. If they could see that people who were in the same professional area were using the machines for certain purposes, they would do likewise. And they would have access to a base of custom software."

The office workers, whose educational levels ranged from high school to master's degrees, also quickly grasped the fact that microcomputer literacy was a means of career advancement and a fast ticket out of the traditionally structured Tunisian social system, wherein one's career mobility is generally restricted to the highest educational degree one is able to achieve.

Harvest Time. Charles Mann returned to Tunisia last February, some two years after the Ministry of Agriculture got its computers, and was impressed all over again at what two little Apples could do. They had expanded to ten, and the entire professional staff at the Ministry planning office is now able to use them. Everyone was producing better work, and more of it.

"Both morale and analytical self-confidence are extremely high," he reports. "They now routinely undertake analytical tasks they never would have attempted two years ago. In particular, the computers have facilitated their forward planning by allowing them to project food consumption and supply estimates through the year 2000. Having this model in a *VisiCalc* framework has allowed them to engage in a dialogue with the minister on the implications of changing various policies affecting the projections. In particular, the extreme grain production shortfall projected by the year 2000 has created a new sense of urgency to improve the production system.

"Directly and indirectly, the computers have improved significantly the analytical capacity of the Office of Planning in ways that should help Tunisia produce more food, the project's ultimate objective."

The Never-Ending Story. As Socrates commented two thousand years ago, "Nobody is qualified to become a statesman who is entirely ignorant of the problem of wheat."

The problem that the Apples in Tunisia are working on is perhaps the basic problem we have—the one that must be solved first if we are to go on to deal effectively with any other. There is no greater economic burden, no deadlier destroyer of families and cultures, and no more effective destabilizer of governments than hunger.

The problem does not respond to emergency measures but to those that address the problem at its root. Organizations like AID and the World Bank are pressing African nations to effect the policy changes and land reform necessary to turn their declining food production around. To its credit, as the primary economic power in the world, the United States has now mounted a five-year "economic policy initiative" for Africa, but the administration is also contemplating budget cuts for the International Fund for Agricultural Development, UNICEF, and the International Development Association, traditional support organizations for the poorest farmers and rural families.

The official response is never enough. It's the dedication and resourcefulness of individuals that have always been the essential ingredients, the things that have made the difference. When the microcomputer came to be, it brought its gift of power to us like Prometheus bringing the secret of fire. It is through the work of such people as Charles Mann, Chris Mock, and Badr Ben Amar, in the service of such a cause, that the best and most human promise of that power is now being realized.

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A Nation of Programmers

BY DON OFFICER

The story goes that the original edible McIntosh apple was discovered in a lonely corner of a southern Ontario farm. The gnarled little tree didn't look like much, but the fruit was bred to be a perfect eating blend of sweet and tart. The tough McIntosh red loves the bracing northern climate and today flourishes coast to coast in Canadian orchards.

The executives at Apple Canada would like the McIntosh story to become more than symbolic, and their dream may be realized if current trends continue. Consider the following: Since opening in 1980, Apple Canada hasn't had a year with a growth rate under 80 percent. Last year, the company's sales to Ontario school boards doubled.

Apple has always been strongest in the western provinces. In the Rocky Mountain province of Alberta it sets the microcomputer standard for the entire school system. Last year, Apple Canada exceeded both its parent company's sales rate and the overall market rate.

The local branch may have the edge in percentages, but the Canadian cultural and economic climate poses some problems for establishing a healthy computer manufacturing industry here.

Canada is still a frontier in several senses. Socially and geographically, large tracts of Canadian territory remain undeveloped. Furthermore, Canadian industry is not quite ready for robotics, and offices are still visibly shaken by the introduction of white-collar automation. However, Canadians are forever challenged by their pioneer situation, and the challenge has produced much excellence, notably in the realm of high technology.

Canadians are known to be technically sophisticated people. Influenced by, yet recognizably distinct from, their neighbor Americans, Canadians sometimes seem obsessed with self-criticism. They relish debugging everything from the country's constitution to the National Hockey League. Obviously then, Canada is a potential "nation of programmers" and software applications specialists. And the Apple has taken root and bloomed here, in applications ranging from medical research to farming in the vast Canadian countryside.

Apple Computer's involvement in Canada has managed to change the country in one small way. Canadians have come to hate the second-fiddle industry image they've earned. The country's semifree, semiprotected market history has made it prime branch plant territory. Companies coming into the country to set up shop must consider manufacturing. Apple Canada came along and said, "We'd like to break that mold. Canada can't support an economical computer manufacturing industry. Marketing and development of software are the way to go."

"In Canada we're a little more conservative and the equipment tends to be more expensive," according to Kevin Ford, a mechanical engineer and proprietor of Hydroford, a company depending heavily on Apple. "On the other hand, labor rates are higher and there is a different work ethic here. The net effect is lower productivity."

Ironically, it's that lower productivity coupled with a relatively small marketplace that seemed to indicate that Apple had found an ideal manufacturing home in this country. However, as Apple representative Bill Holtzman explains, the microcomputer business is not your typical smokestack industry. If the new $20-million Mac plant in Fremont, California, can ship half a million Macintoshes with a work force of 270, the economics of building another North American factory in Canada is questionable.

When Apple Canada was established, commitments were made to the Canadian federal government's Foreign Investment Review Agency (FIRA) to build microcomputers in Canada. But David Killins, soon to be president of Apple Canada, and his associates persuaded FIRA to consider the jobs created by marketing and outside software development firms.

According to Killins, the smokestack mentality that focuses on manufacturing is obsolete. Instead, Apple Canada is building a fifty-five-thousand-square-foot support center housing offices and warehouse facilities near Toronto. Occupancy of the $5-million center in Markham—Toronto's Silicon Valley—is scheduled for July.

The Turtle Always Wins. An impressive example of outside software encouragement is Apple Canada's special relationship with Logo Computer Systems (LCSI). In 1981 a group of Canadians—entrepreneur Guy Montpetit, programmer Brian Silverman, and marketing expert Jim Baroux—met with Seymour Papert in a Montreal kitchen to form LCSI. Because the early Krell, Terrapin, and Texas Instruments versions of the language didn't satisfy the developers, they decided to produce a Logo that wasn't just good but excellent. Their eyes were on the Apple as the best available vehicle.

Apple Computer was equally impressed with the new Logo enthusiasts, and an unprecedented contract was signed with the company. Apple agreed to sell the program under its own label. Apple Logo won the best microcomputer software of the year award in 1981 from the Learning Periodicals publishing group of the United States. Earlier this year the Federation of Quebec Chambers of Commerce awarded its prestigious Mercure prize to Montreal-based LCSI for exceptional performance in exporting Quebec products outside Canada. When Apple Computer donated microcomputers to 9,250 California schools in its Kids Can't Wait program, the chosen programming language was LCSI's Apple Logo.

The LCSI success story may be Canadian in origin, but it's international in scope. Reflecting the bicultural nature of Canadian life, LCSI produces Apple Logo in French as well as English. The company also has more than sixty employees, carries on

research in Paris, France, as well as in Quebec, and has business offices in New York and Tokyo.

Wizard in a Blizzard. "Canada has always been a leader in computer communications," says Kevin Ford, an engineer who saves hours of machine time and vital weeks of turnaround by sending energy-use statistics to Waterloo University in one shot. He calculates his own aggregations and metric conversions on his Apple IIe, then sends only the results to Waterloo.

"The biggest practical applications for microcomputers will appear when they start talking to mainframes. I don't mean simple terminal functions either. What needs to be designed are specific programs to meet the needs and quirks of specific individuals. Then when he has something to send off or take from the mainframe, the user can work it up on his *VisiCalc*, do his calculations or his extractions, and discretely use the big machine only when he must."

Even now, the mighty micro can do things a mainframe can't. Ford once had a contract with a firm in Frobisher Bay, a remote Arctic port where the initial cost of almost anything shipped is dwarfed by the transportation rates. Understandably, in Frobisher, inventory control is a priority.

When Ford was contacted, the firm was running its asset-management system through a terminal link with the south. Unfortunately, bad weather shuts down microwave transmissions a good portion of the time—a major fact of Arctic life. Ford found that the versatile Apple readily accepted the mainframe inventory program. Now, Frobisher only has to send out its orders.

Muscle for Keeping House. Because it was there first, Apple has a lot of friends in the science and medical research communities. Dr. G.W. Mainwood of Ottawa University's medical faculty is researching the energetics of muscles; keeping sets of complex statistics is important to his work. His Apple helps him trace energy sources, limits to muscle capacity, factors in the maintenance of muscle power, and so on. This is what he expected from the Apple.

Photo by C. Vasiloff

A well-walked trail cuts around a thicket of birch trees in Canada. France's colonization of the country wasn't very successful, but French explorers managed to penetrate beyond the Great Lakes to the western prairies by the end of the seventeenth century.

What came with it as an unexpected surprise was the bonus of the Apple's versatility. Mainwood's microcomputer has become an all-around laboratory housekeeper, tracing supplies, accounts, and schedules. The Apple gives him access to experimental literature through international databases. Word processing and file organizing programs help him write papers for journals and tests for his students.

Mainwood's Apple also frees him for research into the critical questions of muscle fatigue. His research may help uncover the causes of and help treat muscular dystrophy. As a solid scientific tool and a general-purpose computer, Mainwood believes the Apple is the best for the money.

The Apple Pulls the Plow. As a terminal emulator, the Apple gives farmers access to crucial market data on various videotex

A trio of Morgan horses stretch their legs on a Morgan horse farm. Apples are very popular with Canadian farmers and ranchers. Software is plentiful and service is nearby.

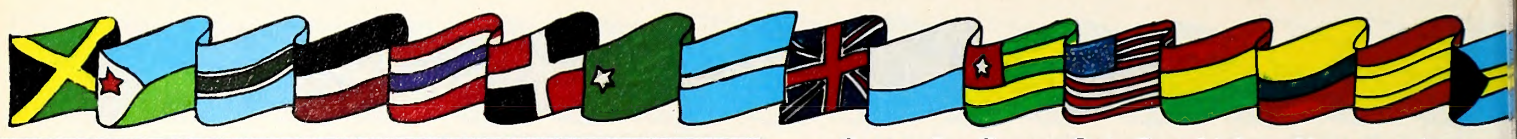

Photo by C. Vasiloff

Zigzagging highway takes travelers up into the northern Rocky Mountains of British Columbia. The highest point in Canada is Mount Logan (19,850 feet), in the neighboring province of Yukon.

systems. Canadian farmers have to stay on top of the facts in order to stay in business because land, machinery, and capital are available only at premium rates. The farmgate (price asked for goods at the farm site) price on crops and livestock can vary greatly, so it comes as no surprise that at every major Canadian farm show there is a computer display.

Canadian farmers, used to buying tractors and milking machines, find it hard to think of buying a microcomputer in the same way. As they begin to see what software can do for a farm's productivity, their way of thinking begins to change.

"The Apple is a thousand dollars cheaper than any other system with suitable farm software. It's versatile and has pioneered dozens of applications, with hundreds of useful programs in the public domain," says Betty Vandenbosch, who, along with her husband Stan, owns a cattle farm near Winchester in eastern Ontario. Stan is also chairman of the Agracomp Computer User Group.

"There's always an available dealer, and the home applications are entertaining and useful," she adds. She sells and services Apple products herself. "The software that attracts farmers most are accounting packages and enterprise analysis disks." In their operation, the Vandenbosches keep track of fertilizer applications, crop rotations, yields, and soil tests. "I know a hog farmer who monitors his two hundred and fifty sows, their breeding data, litter size, and health profiles with an Apple and compatible software."

Garage In, Garage Out. Gary Little, a Vancouver lawyer, represents the more typical Canadian user. Little is "the kind of home user who brings his micro in through the garage," as Bill Holtzman of Apple Canada puts it.

His Apple IIe edits text, acts as a teletypewriter, and accesses legal databases. Little expects it soon to handle his accounting functions. He also uses the machine for hobby programming and as a home security monitor. Belonging to several user groups, including Apple BC Computer Society and the Vancouver PC Users Group, Little sees membership as an opportunity to meet interesting people and to find answers to puzzling questions.

Well, maybe Little isn't so typical after all. He's written a book titled *Inside the Apple IIe*, to be published this year by Brady, and helps organize the annual Pacific Coast Computer Fair.

Scientists at the National Research Council of Canada may actually be more typical Apple users than Little, if typical for the Apple means innovative. For example, their electrical engineering group has an Apple linked with a microscope to provide image analysis with the help of a digitizing pad (soon to be replaced with a Micron Eye).

Similarly, Betty Dion of the Canadian Hearing Society reports of new opportunities for the deaf who, thanks to Apple technology, can use the telephone for the first time.

Can't Stop the Micro. Canadian educators viewed the Apple with enthusiasm when it first appeared. The excitement has since deepened to a commitment in some cases and cooled off in others. Two local issues have determined the direction in which Canadian computer education leans: focus and compatibility.

Focus means the way a classroom computer is used. If the educational aim of the province, school board, school, or teacher is computer literacy, then any computer will do. Their emphasis is on electronic data processing history, binary language, and simple programming. This approach is favored by the Hamilton, Ontario, Board of Education. In Hamilton, Apples are disappearing, being replaced by Commodores.

Over at the Carleton Board of Education in Ottawa, things are different. Carleton is known as a pro-Apple school board. "The kind of programming we can run on the Apple presents a huge variety of options," says Terry Chalmers, a school-board consultant in Ottawa. "The educational material is superior in presentation on Apple software. We say, let the student use the computer. He will acquire the literacy he needs."

Even on a pro-Apple school board like Carleton's, there's a long way to go. Current pupil-to-machine ratios offer the student an allotment of nine minutes a week. The microcomputer budget was slashed in half this year. However, an enthusiastic teacher who wants to do something valuable has access to pilot development money. Schools in the district also run fund-raising drives to purchase more hardware and software.

Software development, not manufacturing, is what makes the Apple tick in Canada. Apple Canada is aware of this and, just as at Apple in Cupertino, encourages third-party software development.

This attitude has made all the difference. As Karl Parks, a software dealer, explains, "We carry more than twenty-two hundred Apple titles in our software catalog. Apple software is imaginative, intriguing, and full of content. Loading is always straightforward and operation doesn't intrude on your concentration.

"I think that's what Canadians want from their microcomputers."

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PERFECT WRITER™	9
CORRESPONDENT™	10
SPELLBINDER™	11
MAGIC WINDOW II™	12
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SUPERTEXT 40/80™	14
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WORD HANDLER™	16
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SANDY™	18

Reviewed by John Martellaro, September 1983, based on Peelings II rating system for performance and performance to price ratio.

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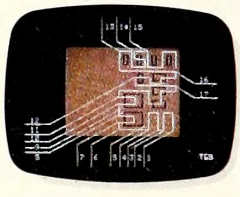

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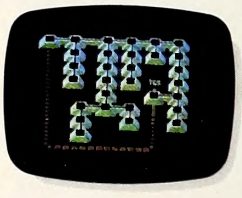

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MARKETALK

Reviews

Unless otherwise noted, all products can be assumed to run on either Apple II, II Plus, or IIe with 48K, Applesoft in ROM, and one disk drive. The requirement for Applesoft in ROM can be met by Applesoft in a language card. Many Apple II programs will run on the Apple III in the emulation mode.

If the cryptic initials at the ends of reviews don't fit the staff listed on page 4, then they refer to guest reviewers. This month, they are Cary Hara, Joel Harrod, Kevin J. Linden, and Willard Phillips.

TURBO PASCAL. When you hear that this CP/M Pascal compiler sells for fifty bucks, you might be pretty skeptical. Sure it's cheap; it's probably a watered-down where's-the-beef compiler with more bugs in it than a tropical forest. Maybe some dumb fool who doesn't want to dish out $300 or more for a "real" compiler would spend money on it, but that's about it. Wrong.

Not only is Turbo Pascal a complete standard Pascal, it's an improved, beefed-up version with features that'll have Pascal programmers dancing in the streets. Here are a few.

Strings have been added as a data type and can be manipulated easily by several handy built-in string functions and procedures. The functions and procedures are basically the same as those in UCSD Pascal, plus the procedure *val* for converting strings to numbers (reals or integers).

Typed constants are new and extremely useful. They are defined just like untyped constants, but the type of the constant must be included along with its value. Since typed constants are essentially predefined variables, they may be used exactly the same as an unassignable variable of the same type. However, they can't be used to define other constants or types, because typed constants are considered variables. Which brings to mind the free format of the var, const, and type declarations. Declarations can be in any order or mixed with each other without any ill effects.

Apart from additions, the only significant difference from standard or UCSD Pascal is the absence of the *put* and *get* functions; to compensate, the *read* and *write* statements have been changed to handle all types of files instead of just text files. Essentially anything you can do with standard Pascal you can do with Turbo Pascal and then some.

Describing Turbo Pascal as fast doesn't do it justice. Its compilations are lightning-fast; no more waiting for those dots to scroll across the screen. The compiler gives you the choice of compiling code into memory, into executable COM files (with the same name as the source code file except with a .COM tacked on), or into CHN files, which are smaller than the COM files, but lack the Pascal library and must be activated through the chain command from another Turbo Pascal program.

Of the three options, compiling to memory is by far the fastest,

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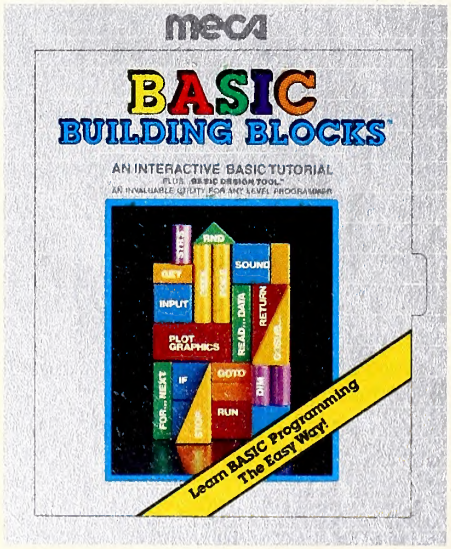

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because it doesn't require as much disk access (none if the source code is already in memory); but either of the other two options compiles so quickly that it'll make you wonder whether the program compiled correctly (don't worry, it really did).

Here's one for Ripley: Turbo Pascal even includes a resident text editor that contains features such as block moves, search, replace, and block deletions. Its design and commands are similar to those of *WordStar*; if the editing keys throw you off, you can redefine them to suit your taste. Some *WordStar* functions have also been removed to conserve space, but what's left is more than powerful enough to write programs. If you decide to use some other CP/M text editor, the compiler will work just fine with the file it creates, but it's much simpler to use Turbo Pascal's editor, since it forms an integrated package with the compiler and system's menu.

Rivaling Turbo's compilation speed is its execution speed. Again there's no comparison to Apple Pascal. If a run-time error occurs during execution, and your source code is still in memory, Turbo Pascal automatically enters the editor, marks where the error occurred, and displays the run-time error code.

It doesn't really make much sense. A complete Pascal system that includes an editor and compiler that reside completely in memory and require no disk swapping and that compile and execute extremely fast, all for a ridiculously low price. The manual is excellent as a reference manual and clearly describes all the differences between Turbo Pascal and standard Pascal. A licensing fee for programs created with Turbo Pascal has been waived, so there are no hidden costs to jump out on you.

If you don't have CP/M, Turbo Pascal is reason enough to buy it. Borland International has created an extremely high-quality product at a more than reasonable price. CH

Turbo Pascal, Borland International (4807 Scotts Valley Drive, Scotts Valley, CA 95066; 408-438-8400). Requires CP/M. $49.95.

THE HEIST. By Mike Livesay and Mike Mooney. The folks who brought *Miner 2049er* to the Apple are at it again. It would be unfair to ask any encore to measure up to an original like *Miner*, as no sequel can carry the excitement and surprise value inherent in a hit the first time around. No Marx Brothers fan would rank *A Day at the Races* with *A Night at the Opera*, but most would acknowledge its superiority to nine-tenths of the competition (say, Olsen and Johnson and the Three Stooges). So it is with *The Heist*. And just as the real world seemed to overwhelm the anarchy of the Marxes in time, the surreal cartoon slapstick of *Miner* has here given way to the mundane walls and floors of an art museum, from which a perfectly proportioned humanoid must steal all the artworks.

Mind you, this is no art museum you're ever likely to visit of a Sunday. Robot drones patrol sectors; booby traps appear out of the floor or plummet from the ceiling. There's a real trick to jumping over the alarms, and it's not likely you'll make it every time. Much coordination and more patience is what the game requires, and you'll probably forget the ostensible "goal" early on and just try to get through the forty-eight rooms on level one, never mind being allowed to move up to the next two levels.

The influence of *Miner* is evident throughout the game, which is full of moving ledges, lifts, escalators, and elevators. Nice touches like the do-it-yourself joystick calibrating menu are back.

If only . . . there were more to it. The near-infinite combinations of floors/levels/screens do not obscure the fact that this is a one-trick game: knowing how to jump and where. *Miner*'s real variety was not in its famous ten screens but in the diversity of skills required—*Pac-Man* and *Donkey Kong* were prerequisites; timing was all; everything was intertwined. With *The Heist*, you can get a new screen every five seconds, but there isn't a heck of a lot to do in most of them.

Nevertheless, what's there is more challenging, better executed, and more pleasing to the eye than is the case with nine-tenths of the competition. Don't expect *Miner*, and your pleasure should be major. AC

The Heist, by Mike Livesay and Mike Mooney, Micro Lab (2699 Skokie Valley Road, Highland Park, IL 60035; 312-433-7550). Joystick required. $40.

MASTER DIAGNOSTICS II & II+ and **MASTER DIAGNOSTICS IIE.** By Dr. Nicholas A. Romano. *Master Diagnostics* takes an otherwise boring task, adds a touch of panache, and makes it rather interesting. The utility

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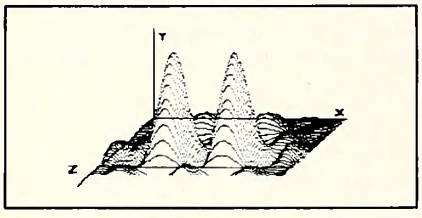

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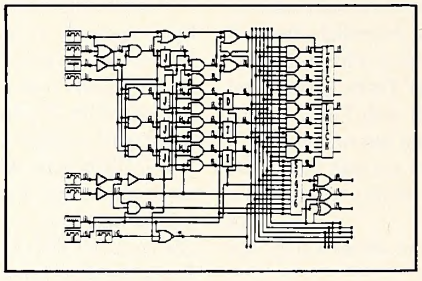
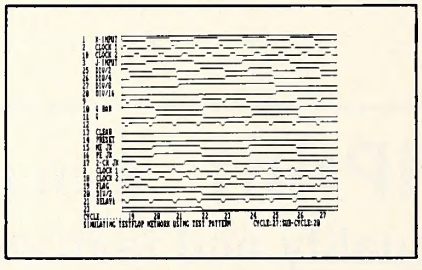


Tne system provides on-screen editors for NETWORKS/MACROS DATA CHANNELS, CLOCK WAVEFORMS and GATES. GATE attributes include DELAY, TRUTH TABLE, NAME and I/O clocking.



The system is available for Apple II and IBM PC computers. A non-graphics version is available for CP/M 2.2 It uses the network editor to create netlists and text printer plots to display simulation results. All versions require 2- 5 1/4" disk drives.

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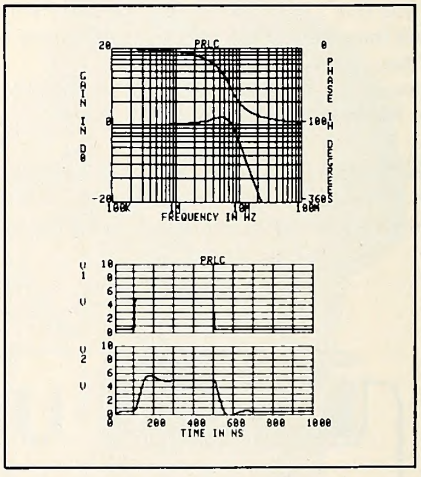

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also instructs. If the doctor tells you that he's going to remove one of your kidneys, you have a right to know why, and if you're prudent you'll demand to be told how to prevent the loss of the second one. Within its area of expertise (the Apple's hardware), *Master Diagnostics* instructs without duplicating the Apple *Reference Manual*.

At each test point during the diagnosis there's an illustration of what the monitor will show if a component fails or if it passes. Bad ROMs are named, and bad RAM chips are identified by their row and column on the motherboard. There's even a glossary of terms for those who don't speak computerese.

In addition to ROMs and RAMs, the program tests ROM cards, parallel cards, the Hayes Micromodem II, video monitor, speaker, paddles, disk drive speed and head alignment, and the drive's write-protect switch.

In addition, there's an instruction set on disk head cleaning, IC pin inspection and cleaning, and housing and monitor screen cleaning. If you're trying to find that elusive intermittent bug that appears and disappears without leaving a clue, *Master Diagnostics* will run an automatic test procedure for one to twelve hours, cycling and recycling RAM chips until the little pest falls out.

In cases where it's possible to repair or replace a bad part, clear instructions are given, and the don'ts are explained as explicitly as the dos.

There's a solid feel to this utility; you'll find yourself using it with a sense of security, and when you're finished you feel that it was worth the price, even if no problems were discovered. WP

Master Diagnostics II & II+ and *Master Diagnostics IIe*, by Dr. Nicholas A. Romano, Nikrom Technical Products (25 Prospect Street, Leominster, MA 01453; 617-537-9970). $55.

SOFTERM 2. Beyond the usual phone lists, macros, and file transfer abilities, communications programs usually include some form of terminal emulation—making the Apple function like a mainframe terminal. In most cases it's a standard TTY device or a popular terminal such as the DEC VT100, which is usually sufficient. However, to emulate another specific terminal, *Softerm 2* is a package to consider seriously.

It's a communications package that provides an extensive list of terminal emulations, among which are ADDS Regent Models 20, 25, 40, 60, and Viewpoint; DEC Models VT52, VT100, and D200; Hazeltine Models 1400/1410, 1500, and 1520; Honeywell VIP7205, VIP7801, and VIP7803; H-P 2622A; IBM 3101-1X and 3101-2X; LSI ADM-3A and ADM-5; Televideo 910, 925, and 950. The list is growing, and emulations are continually updated and revised as necessary.

A keyboard enhancer is included to handle various keyboard definitions of the emulated terminals. It consists of a board that's inserted into an open slot inside the Apple, and a three-key keypad connected to it. The keys function as shift keys and, when used with the main keyboard, allow you to "fake" the function keys supported by *Softerm 2*. Several of the program commands themselves also use the keypad.

Most of the emulations work satisfactorily; however, for the H-P 2622A some of the terminal's capabilities aren't included. The line-drawing character set is replaced with blanks, some of the terminal control functions are ignored, and there's only one page of memory. Half-bright intensity and underlining are employed, but their display depends on which eighty-column board is being used. The function keys and terminal status display are emulated but aren't continually shown on the screen; instead, they're displayed only after pushing one of the keypad combinations, and when they're displayed they cover the bottom two lines of the normal display. The emulation is not totally comprehensive, but it's very functional. The Televideo 910 and Hazeltine 1500 aren't nearly as smart as the 2622A, but their emulations are much more complete.

Softerm 2 uses three types of protocol for file transfer—character, CP/M xmodem, and the *Softerm* Softrans. Character protocol is the standard ASCII text file mode of file transfer; xmodem is an implementation of the CP/M User's Group standard protocol, and Softrans is *Softerm*'s own protocol written in Fortran 77. Softrans operates in block mode and features error recovery, automatic data encoding and decoding, and data compression. To use Softrans, you must have it on both the receiving and sending computers. Softrans is included on the *Softerm* disks and can be transferred to the host computer using the character protocol. At present, however, only a version for the Data General MV/6000 running the AOS/VS operating system is included with the package. Versions for the H-P, Tandem, and Prime are due soon. In the meantime, the user is responsible for implementing the protocol on the host. The source code for all of the necessary modules is included along with explanations of how to implement it.

Files can be transferred among DOS, CP/M, and Pascal disk formats, and they can be edited during transfer to match the data format of the host computer. With the use of the macro command capability, the whole file transfer process can be fully automated from log-on to log-off, including dialing up the host computer with the built-in phone book.

About service: There's lots of it. A twenty-four-hour modem line provides information on any problems users might have experienced with the package, solutions to problems, revisions and patches to the original package that can be downloaded to the user's disk and applied to the program with a utility provided, and general news of interest.

Because terminal emulations are constantly being added and enhanced, it seems like the manual will always be somewhat out of date. New emulations are included in the software but aren't mentioned in the manual. However, documentation for new additions is included on the disk.

Softerm 2 is a very good, highly professional package that can meet the communications needs of many users, especially those wanting to make their Apples look like other terminals to host minis or mainframes. Definitely worth the price. JWH

Softerm 2, Softronics (3639 New Getwell Road, Suite 10, Memphis, TN 38118; 901-638-6850). $195.

PERSONAL TAX PLANNER. That's tax *planner*, not tax *preparer*. The difference is that this program helps answer what-if tax questions as opposed to calculating amounts for tax forms.

Though we've survived through April 15, 1984, it's not too late to start getting ready for next year. *Personal Tax Planner* is a program for planning strategies that will minimize the taxes you'll pay when Uncle Sam holds out his hand.

Two modes of operation are included. One helps you evaluate up to five alternatives that could affect your taxes, and another helps you make

projections of taxes based on potential transactions for up to five years.

The program uses a spreadsheet format similar to *Multiplan* and the various calc programs, so it's easy to create alternatives for comparison by replicating information with just a few keystrokes. The spreadsheet capabilities of the projection mode are especially powerful. For example, married couples can enter separate base-year salaries, a few simple codes, and the assumed percentage growth rate (or one salary can increase by a percent rate while the other increases by a flat rate), and each spouse's appropriate salary will automatically appear for each succeeding year.

Personal Tax Planner performs several complicated tax calculations, among them income averaging, the alternative minimum tax, two-earner married couple deduction, and capital gain deduction.

Unfortunately, screens don't have enough lines for input with appropriate prompts. For example, instead of having its own line, the prior year's state tax refunds must be entered as "other income," while real estate taxes, personal property taxes, and sales taxes must be manually added and entered as "other taxes." Separate lines for each would be helpful, as they would prompt you not to forget certain items. Also, more descriptive prompts would be helpful when reviewing the tax plan later.

Entering data can be tricky because the program doesn't automatically calculate the deduction for two-earner married couples. Instead, it's necessary to calculate (with paper and pencil, adding machine, or calculator, but not the program) the deduction and then enter the proper amount of qualifying earned income for each person.

You don't need to know a lot about computers to use this program efficiently, but it helps to know something about federal income tax law. The value of the program increases with your knowledge of federal taxation, as you can better understand what information is required.

Playing what-if games with taxes helps to avoid year-end surprises, such as underpayment penalties and large balances due to the Internal Revenue Service. JH

Personal Tax Planner, Aardvark/McGraw-Hill (783 North Water Street, Milwaukee, WI 53202; 414-289-9988). $99.

BUG OFF! By Carl Byington. When all typing of code and removing of syntax errors is done, rare is the Pascal program that works properly.

Bug Off! takes some of the drudgery and wasted time out of debugging Apple Pascal programs by eliminating much of the unnecessary compiling and source code editing. Once *Bug Off!* is installed into your program as an intrinsic unit (one or two lines in your source code) no other editing of the source code is necessary except for the changes needed to fix the bugs in the program. Once the program's completely debugged, removing *Bug Off!* from the source code eliminates the evidence of any kind of debugging.

Running a program with *Bug Off!* installed puts you immediately into a debugging command mode. If you want to ignore debugging completely, you may execute the program as if *Bug Off!* were not even there. You may, however, set break points in the program that, when executed, will return you to the debugging command mode, where you may then review or alter your program's variables. If everything looks hunky-dory, you can continue execution or define more break points.

Don't worry if you defined a break point and want to get rid of it; you can easily delete it or simply skip over it. Break points are fantastic, allowing you to see variables or change their values without having to reedit or recompile the source code. Execution can then continue as if nothing had been altered. Once you have located the problem, you can step through it one statement at a time, trace through it in large statement blocks, or even decide to exit the program completely and fix it. If you want to know how the program arrived at its current location, *Bug Off!* can easily display the return path (the procedures that called it). Most of these features would be either impossible or a hassle to do the old-fashioned way.

This is only a small subset of the commands and features that make *Bug Off!* easy to use yet extremely powerful. Don't expect to implement *Bug Off!* and immediately start finding all those bugs, though. Like learning to use most word processors, it takes a bit of time to discover how to get the most out of the commands, but patience will pay off.

One of the lowlights of *Bug Off!* is its manual. It's hard to understand and lacks the polish and careful detail given to the program. The only other irritation is the method of copy protection. Every time you execute

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The language: Spellcaster was designed from scratch to be easy to learn, *yet* formally complete. Its privitives are not numeric operations, but screen operations. Each change in state is visible to the programmer. Spellcaster is highly structured (nested conditions, loops with exit conditions, recursion) but the control structures are expressed with radical simplicity. "Teleporters" are unique language features that partially save and restore process state to permit real-time video game programming.

The environment: Imagine an editor and an interpreter so wed that every keystroke, as it is typed, is syntactically checked and executed, so you instantly see its effects. If you backspace, the program reconstructs its previous state — even in the middle of conditions and loops.

The tutorial: Keystrokes generated by the tutorial guide the user, stroke by stroke, through experiments in programming. The tutorial can generate macro's which execute on the spot. The pedogogical approach is to have beginners build their own video games.

* On the flip side of the Spellcaster disk is a free issue of The Spellswappers' Gazette, a diskette magazine of readers' games, comments and programming know-how.

a program with *Bug Off!* installed, it's necessary to insert the program disk for "product verification"; the verification takes almost a full minute.

Besides its debugging features, *Bug Off!* includes command macros, the ability to save groups of commands to be used later, on-line help files, and a listing command that lists text files during debugging. (H

Bug Off!, by Carl Byington, First Byte (2845 Temple Avenue, Long Beach, CA 90806; 213-595-5716). $49.95.

THE VISIBLE COMPUTER: 6502. By Charles Anderson. Remember those intriguing transparent plastic human models that allowed you to see most of the inside workings of the amazing human body? Of course, these models didn't instantly teach us to be doctors, but instead gave us some general ideas about what's going on inside of our bodies. *The Visible Computer: 6502* serves the same purpose as those models, letting us explore the world of the 6502 assembly language used in the Apple computer.

The Visible Computer: 6502 consists of twenty-four sample programs demonstrating how most of the 6502 instructions work. The manual asks that the user be familiar with Basic to understand the similarities between the two languages, but knowledge of any programming language will do. In a conversational manner, the tutorial introduces basic concepts for the novice programmer. Later, it teaches how to use *TVC*'s commands.

Now the real power of *TVC* becomes evident. *TVC* allows you to step through each individual assembly language instruction while it shows a simulation of the 6502's internal registers. By viewing these registers, you can see the effects of each instruction, which may lead to a more complete understanding of each instruction.

The sample programs contained on the disk demonstrate most of the 6502's instructions, but they do little more than execute the instruction being discussed. A suggestion on the usage of each instruction would have been very helpful. The manual briefly explains the execution of these sample programs, but if you get confused, you're on your own. Even though stepping through the program should reveal the answer to your question, the tutorial could be a little more thorough in discussing some of the programs.

After going through each of the sample programs, you're ready to start writing some really exciting programs; the only problem is that you're done with the tutorial. The disk contains a few larger sample programs, but all you can do is read the listings, step through them, and attempt to understand what's going on. The program has little provision for helping the user write programs. It's kind of like trying to learn how to swim by reading books and watching films about it, but never actually getting into the pool.

One of *TVC*'s features is its power as a debugging tool. Once you've finished the tutorial, bought an assembler, and finally begun to write programs, you can use *TVC* to step through programs similar to the way old-Monitor ROM programmers used the trace and step functions in the pre-Autostart ROM days, but with many added features. If you are tired of looking at everything in hexadecimal, change the registers to decimal or binary numbers. You may also choose which part of memory to view during the execution of a program and the speed of the trace. Using these powerful features could easily take some of the headaches out of debugging assembly language programs.

Watch out, though. *TVC* provides only 1K of user memory. Programs can be virtually any size, but if they conflict with memory locations of *TVC* commands, it's bombs away time.

TVC won't make you an instant 6502 wizard or teach you the greatest sorting algorithms ever; instead, it helps you develop the basic concepts needed to become a good assembly language programmer by showing what goes on inside the machine during a program's execution. (H

The Visible Computer: 6502, by Charles Anderson, Software Masters (3330 Hillcroft, Suite BB, Houston, TX 77057; 713-266-5771). $49.95.

DISKQUIK. By Harry Bruce and Gene Hite. Almost as long as there have been memory cards for the Apple, there have been disk drive emulator programs. People very often buy extra memory because they need it for their spreadsheets or word processors and then discover that, outside of the one program they bought it for, none of their software can use it. Even Basic can only get to the memory via extraordinary programming calisthenics. Such are the perils of putting more than 64K into a 64K computer.

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Softerm 2 provides complete emulation of these terminals: ADDS Regent 20, 25, 40, 60; ADDS Viewpoint; Data General D200; Datapoint 3601; DEC VT102, VT52; Hazeltine 1400, 1410, 1500, 1520; Hewlett-Packard 2622A; Honeywell VIP7205; VIP7801, VIP7803; IBM 3101 Model 10 and 20; Lear Siegler ADM-3A, ADM-5 and TeleVideo 910, 925, 950. And the list is growing all the time. We'll send you a User's Guide, handy reference card, and a telephone number to call if you need more assistance.

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Disk drive emulators were invented to fix this problem by providing memory cards with something generally useful to do. They convince DOS that the extra memory is actually a very fast disk drive, and so allow the user to save programs and other files to the memory card and then retrieve them far more quickly than they would be able to do otherwise. This function turns out to be very useful when the user creates programs that are so large they can't be held in main memory all at once and need to be loaded and run in manageable parts.

The 64K memory bank that comes on the Apple IIe's Extended 80-Column Text Card is the one most used, for the simple reasons that more people have that card than any other, and it's made by Apple. Nevertheless, Basic still can't use the extra memory without calling on machine language routines for help, and programs that were written before the IIe appeared don't recognize the presence of the extra memory.

DiskQuik is packed with little programs you can use to customize the *pseudodisk* that DOS thinks is in slot 3. Since there is no physical disk drive in slot 3, it has no *in use* light. *DiskQuik* solves this by telling you when it's reading from or writing to the disk by clicking the speaker repeatedly. If you find this annoying, you can use the menu program to shut it off.

The menu also allows a number of other things. You can protect the card's graphics memory area so that *DiskQuik* doesn't conflict with double-hi-res graphics. You can lock the disk, which has the same effect as putting a write-protect tab on a real disk. *DiskQuik* disables the DOS *init* command and replaces it with *wipe*, a form of init that works only on the slot 3 pseudodisk. You can disconnect the pseudodisk to restore the *init* command, and reconnect it later with its files intact. With a single menu selection (or by running a program on the *DiskQuik* master) you can back up the entire pseudodisk to a floppy, and with another menu selection (or program) you can restore the contents of the floppy to the pseudodisk.

What distinguishes Beagle's *DiskQuik* from any other disk drive emulator is the same thing that distinguishes all of Beagle's programs. It's more than a sense of humor; it's the joy of sharing. That joy comes through in the menu programs in Beagle disks, which are easy to use, visually interesting, imaginative, and often entertaining. It also comes through in their documentation, which goes beyond mere explanations of how to use their programs and always includes information you can use in other contexts. The Beagles are not only great hobbyist programmers, they're also willing to show you their tricks. DD

DiskQuik, by Harry Bruce and Gene Hite, Beagle Bros (4315 Sierra Vista, San Diego, CA 92103; 619-296-6400). $29.50.

EXPENSE ACCOUNT MANAGER. While this program can be helpful to employees who must account for expenses, it is especially useful to those people who, for tax or other record-keeping purposes, need to track their expenses on a yearly basis.

Starting a statement and entering expenses is the electronic equivalent of filling out a company expense report. When entering expenses, you're given the choice of being prompted for each expense item or entering expenses individually by their codes. Using codes is faster if only a few expenses are to be entered, but being prompted helps prevent overlooking any stray expenses.

After a statement has been completed, it's necessary to print it (eighty-column printer, please) and check for accuracy. Incorrect entries mean having to go back to the main menu and load a module for modifying and deleting expenses (even if an error is found as soon as it is entered, you'll have to go back to the main menu to correct it). A data disk can accommodate only ten statements.

If you'd like statement totals transferred to the year-to-date totals, the system reorganizes all the expense items into groups called budget lines and adds them to expenses from previous statements. Initially, the budget lines conform to the lines found on IRS Form 2106; again, those can be changed to suit individual needs.

One of the system's strong points is how easily it can be customized. When you initialize a data disk, you can choose to have expenses divided between clients or projects. Then, every time you enter an expense, the system will ask you for a client/project code and will add these subtotals to the statement. Private contractors and consultants who charge expenses to various clients will find this feature invaluable, though it would be even more helpful if client coded expenses were also subtotaled on a yearly basis.

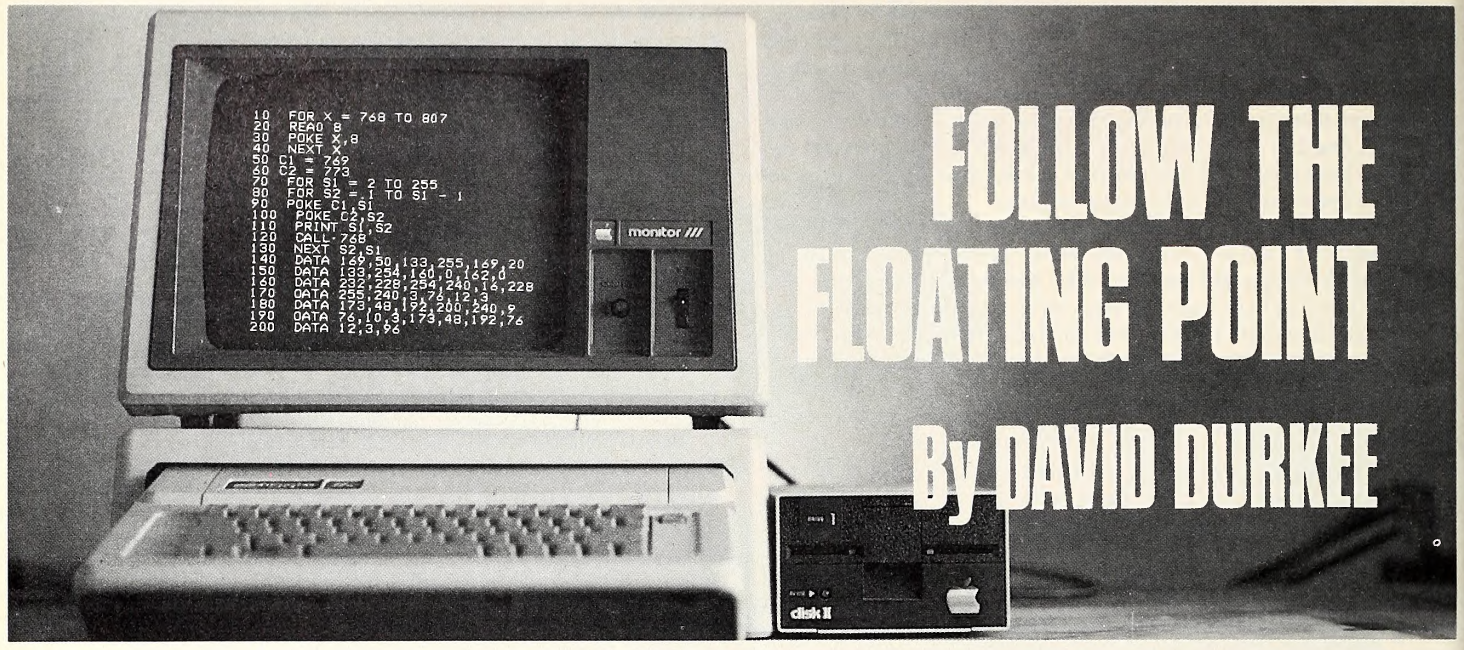
Changing the statement groups or the budget lines can be cumbersome. Deleting a line to replace it with another moves all lines below it up a line, which means the new line will appear at the end instead of where the deleted line was. Moreover, expense items don't automatically "move up" with the budget lines they were listed under; instead, they must be rearranged through the program's Options/Change module.

Once the budget lines and expenses are arranged, you can enter a budget amount for each line. A printout will include the budget amount, how much has been spent to date, and the difference or excess. The report also predicts whether you will be within the budget at year's end.

In general, *Expense Account Manager* is easy to use. Most of the prompts are set up so that hitting the return key is the same as entering a null response; this makes it easy to flip through prompted questions. Once you understand the system structure, polite, informative error messages and simple dialogue make the manual almost unnecessary. In most cases, entering an asterisk is all it takes to save what has been entered and return to the previous menu.

This friendliness, coupled with the system's adaptability, makes it easy to overlook its few idiosyncrasies, especially at tax time, when *Expense Account Manager*'s clear, detailed records can make the chore of recording business deductions as easy as filling in the blanks. KJL

Expense Account Manager, Adaptive Software (1868 Cavell Avenue, Highland Park, IL 60035; 312-831-4420). $150.



FOLLOW THE FLOATING POINT

By DAVID DURKEE

A Stellar Performance

If you were thoroughly confused by the labels under figure 2 last month, there's a good reason. The labels were thoroughly confusing. All references to ULIN were supposed to read VLIN and all of the H coordinates should have been X coordinates. Our supply of Vs and Xs has been replenished and steps have been taken to see that such shortages don't happen again.

Lo-res graphics are colorful and fun to play with, but let's face it—they're blocky. After a short time, that blockiness gets to look childish and the appeal begins to wear thin. Fortunately, there is another graphics mode that is easily accessible from Applesoft: hi-res. Unless you've confined your Apple use entirely to spreadsheets, word processors, Infocom adventures, and, of course, following that ol' floating point, you've probably seen hi-res graphics in action in many different guises.

Hi-res graphics have been used for two-dimensional line drawings, three-dimensional line drawings, paintings, logos, charts, arcade games, educational games, lower-case lettering and seventy-column text on standard Apple II Pluses, and a slew of other things. Unfortunately, many of these things can't be done well in Applesoft. Not that Applesoft isn't sufficiently flexible; it's just not sufficiently fast. Hi-res graphics deal with large amounts of memory.

Same Name, New Initial. Learning the first commands of hi-res graphics is simple. The first three commands are close cousins of the first three lo-res commands, which are *gr*, *color*, and *plot*. To derive their hi-res equivalents, tack an H onto the beginning of each of them and you get *hgr*, *hcolor*, and *hplot*.

As you might guess, hgr gets us into the hi-res mode. Like gr, it leaves four lines at the bottom of the screen in text mode, which allows us to give hi-res commands in immediate mode and see what they do on the screen. There is another way of getting into hi-res graphics: the *hgr2* command. The most obvious difference between hgr and hgr2 is that when you use hgr2 it doesn't display four lines of text at the bottom of the screen.

The more obscure difference between the two is that they use different areas of memory. All of the display modes in the Apple are memory-mapped. That means each text character, lo-res block, or hi-res dot corresponds exactly to a particular unit of memory. Hgr and hgr2 activate and display two separate pages of hi-res memory. This fact has two major implications: Sometimes we will choose to use a page of memory based on where it resides in memory. Very long Applesoft programs conflict with hi-res page one. However, a program will conflict with hi-res page two only if it's more than twice as long as one that conflicts with page one. The second implication is that separate pictures can be drawn on the two pages.

The memory conflicts are worth discussing now because they can become terribly inconvenient when they occur unless you can identify and deal with them. There are two possible symptoms:

1. After turning on hi-res display mode with the hgr command, the program crashes in some unusual way. When you list the program, you discover that the last few (or several) lines of the program have vanished mysteriously.

2. As you are drawing on the hi-res screen, garbage begins to appear in addition to the lines your program is drawing. The garbage first appears in the upper left corner of the screen and proceeds in a perfect horizontal line to the right side of the screen. Other than its orderly progression, the garbage looks like random dots—like some kind of Morse code notation. When it reaches the right side of the screen, it reappears on the left side about a third of the way down. If allowed to continue, it may cause the program to behave unpredictably, but it will not damage the program code itself.

The first symptom is caused by the program code's using space in the hi-res memory area. Program code begins at decimal address 2048 and proceeds to higher addresses as the program gets longer. The first hi-res page begins at 8192. The first thing hgr does is clear the screen to black, which is accomplished by clearing the hi-res memory area to all zeros. If the program goes beyond address 8192, part of the program will be cleared to all zeros as well.

The second symptom is caused not by the program but by its variables, conflicting with hi-res memory. Variables start where the program ends and build toward higher addresses. Their space is not allocated all at once, but one variable at a time as the program encounters them while running.

The easiest solution to either of these problems is to use hi-res page two instead of page one by substituting hgr2 commands for all the hgr commands in the program. If you absolutely have to have four lines of text at the bottom of the screen, there are other solutions, but they aren't simple. We'll look at them in the months ahead, when we talk about machine language with Applesoft and memory use.

A Coordinated Attack. Let's get back to hgr, hcolor, and hplot. These commands are seen most easily by typing them from the keyboard. Here's a quick tour:

```
HGR
```

When you typed this, most or all of the screen turned black. It may have looked like Venetian blinds closing. If the cursor was near the top of the screen, it seemed to disappear. It is actually still there, but it's hidden by the hi-res display. That is, it still exists on the text screen memory map, but that part of the text map isn't being displayed right now. To demonstrate this, hit return and then type *text*. When the screen flips back to text mode, you'll see your original hgr command, a bracket prompt on an otherwise blank line (where you hit return), and the text command. You'll also see that, no matter where all this occurred, your cursor is now at the bottom of the screen. This is a side effect of the text

command. Type *hgr* again to return to graphics mode.

```
HCOLOR= 3
```

Typing this will have no effect on the screen, but it sets the color of any lines you draw subsequently to white. Figure 1 shows a list of the other legal values for the hcolor command and the colors they result in (or should result in—sometimes different monitors come up with different colors).

```
HPLOT 0,0
```

Like lo-res graphics, hi-res graphics use a coordinate system with its origin at the upper left corner of the screen. The X coordinate (the arbitrary name we will use from now on to discuss horizontal distance in dots from the left edge of the screen) can range from 0 to 279. The Y coordinate (ditto—the vertical distance from the top of the screen) can range from 0 to 191. If the four lines of text are visible at the bottom, all points with a Y coordinate greater than 159 will be invisible. Plotting within that region will not cause an error message, but plotting outside of the legal X range or the greater legal Y range will.

Here's where hi-res graphics get more sophisticated than lo-res graphics:

```
HPLOT 0,0 TO 279,159
```

Diagonal lines! A line is created by the command *hplot* and X,Y coordinates for a starting point, followed by the word *to* and X,Y coordinates for the ending point. Here's another surprise hi-res has in store:

```
HPLOT 0,0 TO 279,0 TO 279,159 TO 0,159 TO 0,0
```

You can keep tacking *to X,Y* onto the end of hplot statements to plot a series of continuous lines. Each new line begins where the last one ended. And one last surprise, for this month anyway:

```
HPLOT TO 140,159
```

That's right, you can begin a plotting command with *hplot to* and Applesoft will assume that the last point plotted is the starting point.

Plotting on Paper. One way to become familiar with hi-res graphics is to use Applesoft commands and programs to create static displays. Let's start to design a logo for a fictional company, Stellar Software. Before you start typing commands and coordinates, it's a good idea to sketch on paper the picture you want to draw. Graph paper is excellent for this because you can set up a grid of Cartesian coordinates and translate the lines you draw directly into the parameters for hplot commands.

Figure 2 shows just such a design for the Stellar logo. After getting the parameters from this design, we're ready to begin plotting. Let's start a program with the proper setup commands and then proceed with the S:

```
10 HGR : HCOLOR= 3
20 HPLOT 40,60 TO 30,50 TO 10,50 TO 0,60 TO 0,70 TO 10,80 TO
   30,80 TO 40,90 TO 40,100 TO 30,110 TO 10,110 TO 0,100
```

When you run the program as it is so far, you get a nice big S on the screen. There are a lot of numbers in this program, but you can easily see where you might have made any mistakes just by running it and seeing what the result is. To continue:

```
30 HPLOT 60,40 TO 60,100 TO 70,110 TO 80,110: HPLOT 50,60 TO
   70,60
```

This one had to be done with two separate hplot commands because it isn't composed of one continuous stroke. Or, more simply, if you have to lift your pen when you write the letter, you have to use another hplot command when you plot it.

But what about our method? Is it sufficiently flexible? What if we wanted to move the word? What if we wanted it to come out a different size? Obviously, we would have to go through and change a lot of coordinates. To scale it to half size, for example, we would have to divide all of those numbers by two. To move it to the right, we would have to add some constant to all of the numbers. Sounds like dull, tedious work. Sounds like the kind of work the Apple was made for.

If we were to enter the numbers needed to create the seven letters of the word *stellar* into data statements instead of hplot statements, we could have the computer manipulate them before plotting, saving us a lot of work. First we should do some translation ourselves. Since all of these numbers are divisible by ten, we might as well divide them so that our raw data holds the coordinates for as small a picture as possible. Also, since our lowest Y coordinate is thirty (before dividing by ten), let's subtract thirty from all the Y coordinates before dividing by ten. This will make it simpler to put the picture anywhere on the screen in any size. The easiest way to do that is to change the axis numbers on the graph paper design of the logo. Starting on the Y-axis with what is now thirty, number 0, 1, 2, 3, and so on. Then just cross off the zero at the end of all the X coordinates and you're done.

This just leaves one more problem. How do we tell the computer, in data statements, when to *hplot* and when to *hplot to*? And how do we tell it we're done? Easy: We use special values embedded in the data that our data-reading routine will understand to be commands, just as we did with the lo-res letter data last month. The only requirement is that the commands can't be numbers we would use for coordinates. How about negative numbers? Okay, −1 means new penstroke, −2 means all done. As an example, here's the data for the S:

```
500 REM STELLAR DATA
510 DATA −1, 4, 3, 3, 2, 1, 2, 0, 3, 0, 4, 1, 5, 3, 5, 4, 6, 4, 7, 3, 8,
    1, 8, 0, 7
```

Here's a routine that will read that data and plot it:

```
20 HGR2 : HCOLOR= 3

600 REM DATA PLOTTER
610 RESTORE
620 READ X
630 IF X = −2 THEN 680
640 IF X = −1 THEN READ X,Y: HPLOT X,Y: GOTO 620
650 READ Y
660 HPLOT TO X,Y
670 GOTO 620
680 RETURN
```

The *restore* command in line 610 sets the data pointer to the first piece of data in the program. Normally, it starts at the beginning of the data and reads one element at a time; and when it runs out, it runs out. With restore, it can read the same set of data over and over again without having to read it into an array. This is a useful way of storing data that doesn't have to change and that you always want to get in the same order.

Hcolor	Color
0	black
1	green
2	violet
3	white
4	black
5	orange
6	blue
7	white

Figure 1. Hi-res colors.

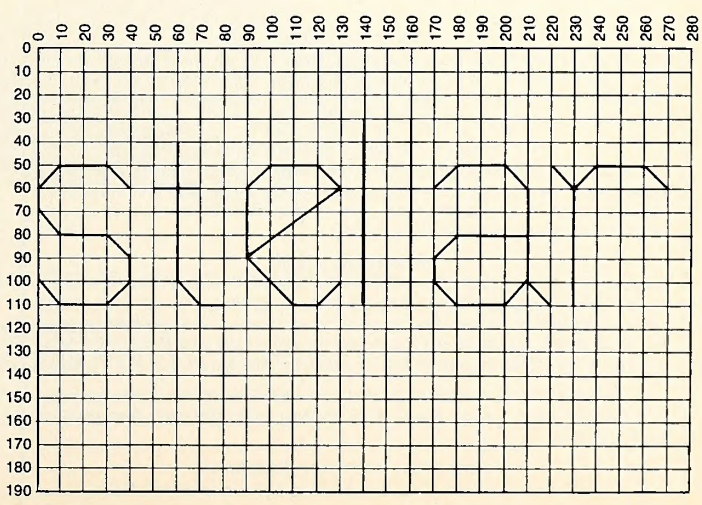


Figure 2. Stellar logo design.

If you run the program now, you'll get a very small S at the top of the screen and an out-of-data error. The out-of-data error can be avoided by putting a −2 element at the end of the data. But we don't need to worry about that for now. The real problem is how to scale and relocate the picture.

As usual, there are several ways to do this, but the one that will teach you the most and be the easiest to use in the long run is *defined functions*. A defined function works like this: A function is always called *FN* something. The something is named with the same rules as a variable name, so FN X is a legal function name, as is FN X1; but FN 1 is not. You define the function with the *def* command:

```
DEF FN Y (Y) = (Y - 30) / 10
```

That would be the function to translate our old Y values from figure 2 to the new ones we'll use in the data statements. The arithmetic expression on the right of the equal sign usually includes the variable in parentheses, called the function's argument, which follows the function name. It may also contain other variables or constants. When you use this function, you can use a constant or another variable as the argument, such as:

```
]PRINT FN Y (120)
9
```

This will substitute the value of 120 for the variable Y as it evaluates the function, but it will not change the value of Y in memory. If multiple variables are used in the function definition, only one can be used as the argument.

Here's how we'll use two functions in the *Stellar* program:

```
10 DEF FN X(X) = XB + X * M: DEF FN Y(Y) = YB + Y * M
```

So XB and YB will be used as beginning points—the upper left corner of the shape—and M will describe the size of the shape. If we wanted to change the scale of the X-axis to be different from that of the Y-axis, we would use different variables for magnitude, say MX and MY.

Now we just have to substitute FN X (X) for the Xs and FN Y(Y) for the Ys in the hplot statements:

```
640 IF X = -1 THEN READ X,Y: HPLOT FN X(X), FN Y(Y): GOTO 620
660 HPLOT TO FN X(X), FN Y(Y)
```

So, try this:

```
30 M = 20:XB = 10:YB = 10: GOSUB 600
```

You'll still get an out-of-data error, but other than that, what appears on the screen should tell you how you're doing so far. The rest of the data, ending with −2, of course, will get rid of that end-of-data problem.

```
520 DATA -1, 6, 1, 6, 7, 7, 8, 8, 8, -1, 5, 3, 7, 3
530 DATA -1, 9, 6, 13, 3, 12, 2, 10, 2, 9, 3, 9, 6, 11, 8, 12, 8, 13, 7
540 DATA -1, 14, 0, 14, 8
550 DATA -1, 16, 0, 16, 8
560 DATA -1, 17, 3, 18, 2, 20, 2, 21, 3, 21, 7, 22, 8, -1, 21, 5, 18, 5,
    17, 6, 17, 7, 18, 8, 20, 8, 21, 7
570 DATA -1, 22, 2, 23, 3, 23, 8, -1, 23, 3, 24, 2, 26, 2, 27, 3, -2
```

For some fancier logos, try looping through and incrementing the XB and YB values, like this:

```
30 M = 10
40 FOR YB = 0 TO 12 STEP 3
50 XB = 2 * YB / 3
60 GOSUB 600
70 NEXT YB
80 END
```

Lots of other things are possible, too. If you don't like the name *Stellar*, try putting in your own software company name. Or your name. Try looping through and incrementing M as well as XB and YB. If you're really ambitious, you might try making a cross between this program and last month's lo-res banner to make a hi-res banner.

Last month's banner and this month's logo are sort of examples of shape tables. That is, they use a collection of data to draw a picture. Applesoft has a facility for shape tables built into it. It's more complicated than the ones we've looked at, but more powerful as well. Among other things, it allows some simple animation. And that will be the topic of next month's Follow the Floating Point. ■

GLOSSARY

DEF: The command to define a user-created function. Followed by the function name, an argument, an equal sign, and the expression to be used in evaluating the function.

Defined functions: A way for the programmer to set up equations that will be used frequently in the program as functions. They make it easier to use mathematical translations of one kind of data to another, and they make programs easier to read and write.

FN: The Applesoft reserved word signifying the beginning of a function name. The rules for a legal function name are the same as the rules for a legal variable name. It must start with a letter, and only the first two characters after the FN are significant.

HCOLOR: Sets the color for hi-res plotting. Although assigned like a variable, it cannot be used in an expression. Its legal range of values is from 0 to 7.

HGR: Turns on hi-res graphics mode, page one, and clears the screen. Four lines of text are displayed at the bottom of the screen.

HGR2: Turns on hi-res graphics mode, page two, and clears the screen.

HPLOT: Followed by a coordinate pair, plots a point. Followed by a coordinate pair, the keyword *to*, and another coordinate pair, draws a line. Followed by the keyword *to* and a coordinate pair, draws a line from the last point hplotted.

Memory-mapped graphics: The graphics system used by the Apple in which areas of memory are set aside to represent characters on the text screen, blocks on the lo-res screen, or dots on the hi-res screen.

RESTORE: Used with *read* and *data*, this command sets the data pointer to the first element of data in the program, allowing data to be read more than once.

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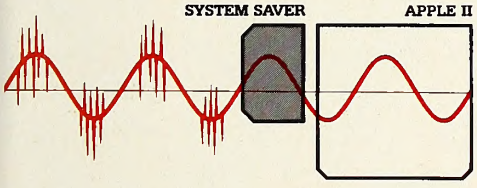

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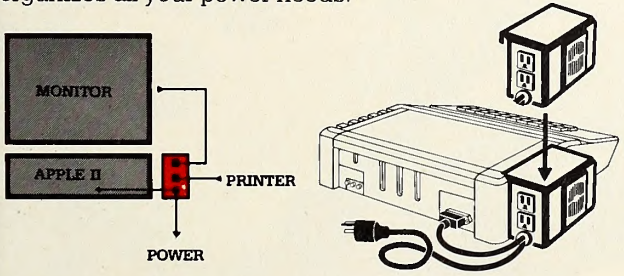

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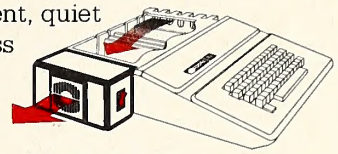

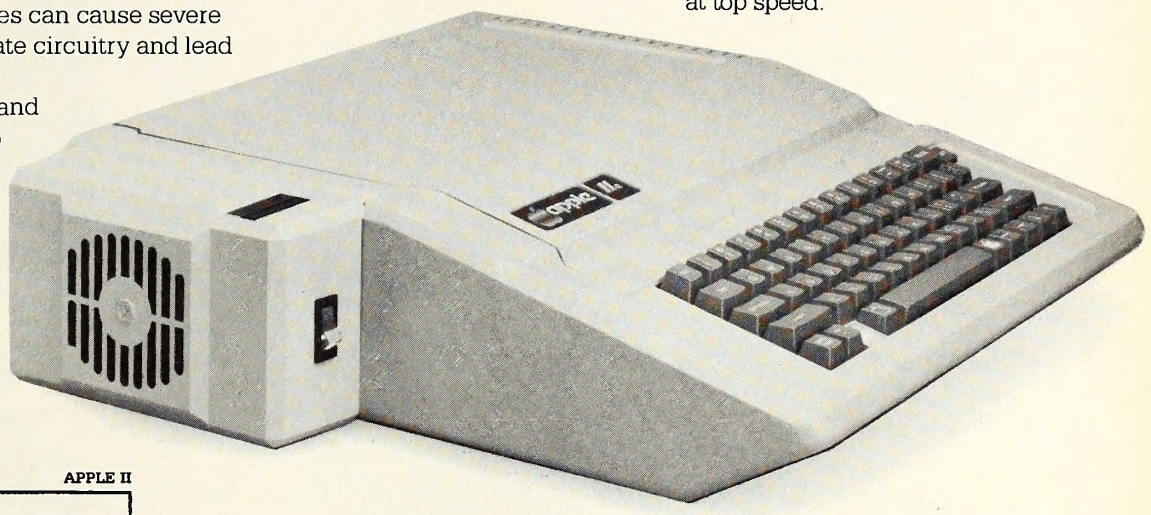

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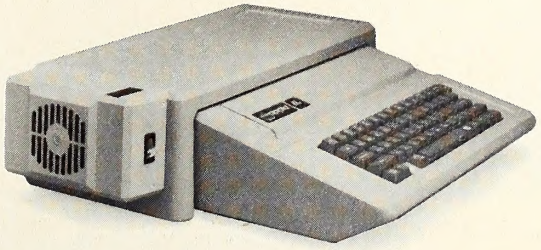

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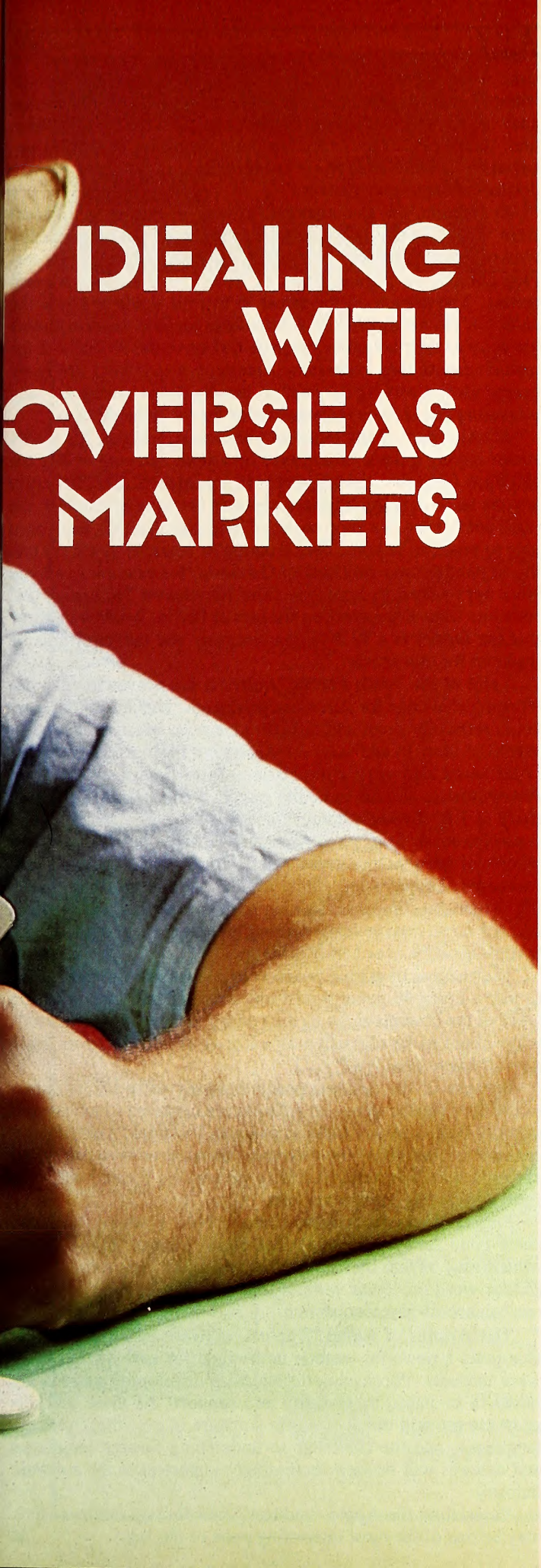

DEALING WITH OVERSEAS MARKETS

BY GARY CARLSTON

Anyone who knows anything about the Apple computer knows that the Apple is not just a computer, it's a culture. A culture that includes bluejeans and *Softalk* and a million inventive people with a common bond. Apple, in the form of its founders Steve and Steve, spawned the US Festival and assured us that 1984 would not be like *1984* and . . . wait a minute. To the rest of the world Apple is just another computer; no more. It is not a cross of silver that protects the user from totalitarianism (the head of the Argentine prison system is an Apple owner) and bad bigness and three-piece suits. So when one is in the business of exporting Apples and associated products one needs to distinguish the mystique from the computer. Both may be exportable, just as California can export the sunshine that goes into her agricultural products along with the products themselves, but the seller should not be confused as to which is which.

In thinking about the Apple market overseas, it's best to start by putting the size of the market in perspective.

Japan may be a wonderful place to sell salmon and Douglas fir, but as a market for Apple software it ranks about as high as the Minneapolis metropolitan area. And the rest of the world, meaning predominately Europe and Australia, has about as big an Apple software appetite as Chicago—certainly not insignificant, but small enough that any company wishing to export needs to give considerable thought to what its overall goals in foreign Apple markets might be.

These conditions may very well change. Apple is well positioned to expand greatly its market share overseas, where the name IBM doesn't so readily stand in its way; although illegal Apple clones may offset this.

At present, the problem of exporting Apple software can be expressed fairly simply: Is it profitable? American distributors, taking advantage of the same economies of scale that enable them to function in the United States, already sell American product overseas, so there may be no incentive at all for suppliers to make their own contacts. Distribution is, after all, a valuable and expensive service, so why duplicate the effort?

One reason is the wish to enhance the distributors' efforts, rather than duplicate them—by providing software and documentation in the local language, for example. A U.S. company may wish to expend an extra effort to gain a greater market share in the face of the foreign domestic competition, which is often protected by trade barriers. The very willingness to export can lead to reciprocal arrangements that provide the American company with foreign products for the American market.

Sayonara. The Apple software market in Japan has probably never exceeded five hundred units of any given package. Heavily documented software is very difficult for the Japanese to use because English isn't widely understood.

Over the past few years many companies have translated packages into Japanese, which can increase the market penetration of the product, provided it doesn't increase the price significantly. Fortunately for American suppliers, the Japanese remain infatuated by American creativity, so American software can command higher prices than local products. This is somewhat ironic: Japan is the only foreign country whose quality of entertainment software approaches American standards and whose many programmers have had success selling their programs in the U.S. (through American publishers).

In an effort to spur its domestic software industry, Japan is formulating tighter copyright laws to lessen the impact of piracy and is exploring hardware standards. The MSX, an eight-bit standard built around a Z-80 and the Texas International graphics chip, will enable Japanese companies to cut their teeth on a sizable domestic market before venturing into the volatile American and European markets.

Why Don't the English Teach Their Children. . . . In contrast to Japan, Great Britain has always been a good market for Apple software but has never been a successful producer of products for the American market. Favored by a common language and relatively little red tape, American suppliers and distributors have long found a steady market for products in England. This has slowed in the past year or so because the strength of the American dollar makes U.S. products sell for two to four times the price of domestic software products.

As a result, English software companies have thrived. The price differential has spared British producers from being compared point by point against technically more refined American Apple software products. The long-term prognosis, however, would seem to indicate that domestic competition in Great Britain will result in significantly improved software, just as it has here, and that American software will be priced out of the British market when that occurs.

American software suppliers would look very favorably at a decline in the strength of the dollar. An increase in the relative strength of the pound or the mark means that American goods priced in dollars become less expensive in foreign markets. For example, presently an American-made game for the Apple computer costs twenty-five to thirty-five pounds sterling in England, compared to eight to twelve pounds for an English-made game. Four years ago, when the dollar was not so strong, that same American game would have cost ten to fifteen pounds sterling while the English game would still have cost eight to twelve pounds.

It's Very Fancy, the Continental. On the European continent, many software vendors are looking at major European distributors to help translate and sell American products. France has a law requiring French documentation for all software sold there, and, though the law is inconsistently enforced, it creates uncertainty around American products that don't have French documentation.

In addition, the role of the distributor in Europe is different from what it is here. Distributors are the exclusive representatives of the products they carry, with marketing and customer service obligations beyond those of American distribution companies. The person on the street in Europe tends to know the names of the major product distributors, because the distributors are contractually bound to advertise and serve the products of the manufacturers they represent. American distributors are more geared toward serving the retailer, usually not assuming as many marketing and service responsibilities for the manufacturer.

A major part of any business transaction, whether it's a consumer buying a piece of software or a store agreeing to buy the software from the manufacturer, is confidence. The difficulty anyone faces in doing business overseas is trying to establish the same confidence in a short series of meetings that they have been able to establish at home over a period of years. If you were trying to publish your products in Germany, for example, and you were approached by someone from Bertelsmen Publishing and someone from KomputerGesellschaft of Berlin, would you know that the former is a $2.5-billion company and the latter a name made up for this article?

Tales of the South Pacific. Australia has proven to be an interesting challenge for American producers. The Australian market is relatively small and difficult to service because of its geographical size. In addition, the Australian business environment is untamed and very competitive. Interviewing Australian distributors is similar to taking part in small talk at a poolside party at J.R. Ewing's house. Words like *biggest*, *richest*, and *control* seem to fit in when Australians discuss business. But the winner of the shootout at the Aussie corral seems to be a mild-mannered, bespectacled young organization named Imagineering. American companies looking for a partner down under have reacted positively to Imagineering's management style, which favors footwork over breast-beating.

The chances of getting products into Australia without having to pay a hefty 40 percent customs duty depend very much on whether the customs agent on duty on a given day thinks that software ought to be classified as a toy or as stationery or plain doesn't know what it is.

Because of the customs problem, many software manufacturers have chosen to have their software mastered (duplicated in quantity from a master disk) in overseas locations. This practice enables foreign distributors to meet demand more quickly and cheaply, which is a major key to preventing pirated software from dominating foreign markets.

Programmers from Australia and New Zealand have had some good success in the United States market. Many Apple owners may be fans of *Southern Command*, *Dragon's Eye*, or the *Zardax* word processor without realizing they're contributing to our balance-of-payments deficit.

The Apples of Babel. Apple's software base gives Apple Computer a powerful weapon in the fight for new foreign hardware markets. Purchasing decisions in developing nations are likely to be based on stability and support. As these markets grow, so too will the demand for software in ever-more-obscure languages, and the challenge to understand foreign languages and cultures will become increasingly important in the software industry.

Translating the Apple "culture" into foreign environments may be one of the most interesting parts of the task. ■

OUTTAKES FROM AN EXPORTER'S NOTEBOOK

Years ago, we collared a deal with Japan—eventually worth millions—by leaving a copy of *Harvard* magazine on the coffee table. Not knowing anything about Japan, but thinking that foreigners often value education over money, our company officers hoped to compensate for their lack of funds. Upon entering the office (a living room), the president of the Japanese company saw the magazine and jumped into a three-day conversation on world history, literature, and Western moral thought. At the end of the three days, he signed a deal with us without ever completing his itinerary of American suitors.

●

I once went to New Zealand at the request of a distributor who wanted nationwide rights to our Apple product. When I got there, the New Zealander asked me to help him set up the Apple because he'd never seen one before.

●

Last year we received a letter from England that began, "Dear Sir, we are probably the least successful software publisher in England, with the worst sales force, the lousiest typist, and the most inept board of directors in the country. . . . If you don't want our software, we can live with it, because we are pigheaded enough to believe that this computer genius we have locked up in the basement will eventually come up with something useful."

Their games were the best I had ever seen from England.

●

Just before the British-Argentine war over the Falkland Islands, we had a regular customer in the Falklands who was asking for islandwide rights. We didn't ask whether he wanted both English and Spanish rights.

●

We've had requests for Lebanese educational rights, rights for the South African "coloured" market, and Polish rights; we've even had a request from the director of Argentinean prisons—during their reign of terror—for more combat simulations. The lesson seems to be that, no matter what goes on in the world, people want software and will eventually want it to reflect their culture, however remote from the peaceful traffic jams of Silicon Valley. ■

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VISA

Apple Mechanic's hi-res type routines and fonts are usable in your programs WITHOUT LICENSING FEE. Just give Beagle Bros credit on your disk and documentation.

APPLE MECHANIC

HI-RES SHAPE EDITOR / TYPE FONT DISK
by BERT KERSEY

$29.50: Includes Peeks/Pokes Chart & Tip Book #5.

SHAPE EDITOR: Keyboard-draw hi-res shapes for animation in your Applesoft programs. Access & create **proportionally-spaced hi-res Typefaces** with each character re-definable as you want. Six fonts are included on the disk. Excellent LISTable Applesoft demos show you how to animate graphics and create professional-looking Charts and Graphs.

BYTE-ZAP: Rewrite any byte on a disk for repair or alteration. Load entire sectors on the screen for inspection. **Hex/Dec/Ascii displays** and input. Educational experiments included for making trick file names, restoring deleted files, changing DOS, etc.

MORE: Useful music, text and hi-res tricks for your programs. Clear educational documentation.

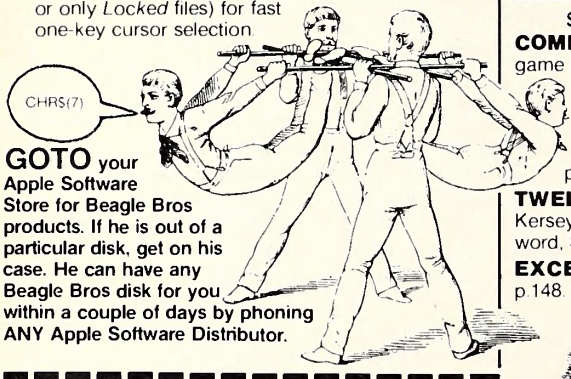
APPLE MECHANIC TYPEFACES

by BERT KERSEY

$20.00: Includes Peeks & Pokes Chart.

26 NEW FONTS for use with Apple Mechanic programs. Many different sizes and typestyles, both ordinary and Artistic. Every character—from A to Z to "★" to "□"—of every typeface—from "Ace" to "Zooloo"—is re-definable to suit your needs. All typefaces are **proportionally spaced** for a more professional appearance. People *do* notice the difference!

BEAGLE MENU: Display only the file names you want from your disks (for example, only *Applesoft* or only *Locked* files) for fast one-key cursor selection.



GOTO your Apple Software Store for Beagle Bros products. If he is out of a particular disk, get on his case. He can have any Beagle Bros disk for you within a couple of days by phoning ANY Apple Software Distributor.

RUSH the following disks by First Class Mail—

☐ Alpha Plot	$39.50	☐ Frame-Up	$29.50
☐ Apple Mechanic	29.50	☐ GPLE	49.95
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☐ Beagle Bag	29.50	☐ Silicon Salad	24.95
☐ Beagle BASIC	34.95	☐ Tip Disk #1	20.00
☐ DiskQuik	29.50	☐ Utility City	29.50
☐ DOS Boss	24.00	☐	
☐ Double-Take	34.95	☐ ADD ME to mailing list.	
☐ Flex Type	29.50	☐ ALREADY ON mail list.	

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Add $1.50 First Class Shipping. Any-Size Order.
Overseas add $4.00. COD add $3.00. California add 6%.
ALL ORDERS SHIPPED IMMEDIATELY.

DOS BOSS

DISK COMMAND EDITOR
by BERT KERSEY and JACK CASSIDY

$24.00: Includes Peeks/Pokes Chart & Tip Book #2.

RENAME DOS COMMANDS & Error Messages—"Catalog" can be "Cat"; "Syntax Error" can be "Oops" or almost *anything* you want it to be.

PROTECT YOUR PROGRAMS. An unauthorized Save-attempt can produce a "Not Copyable" message, or *any* message you want. Also easy List-Prevention and other useful Apple tips and tricks. Plus one-key program-execution from catalog.

CUSTOMIZE DOS. Change the catalog Disk Volume heading to your message or title. Omit or alter catalog file codes. Fascinating documentation, tips and educational Apple experiments.

ANYONE USING YOUR DISKS (booted or not) will be using DOS the way YOU designed it.

```
10 LIST: LIST: LIST: FOR ZZ=PEEK(175)+PEEK
   (176)*256+36 TO 3072: POKE ZZ,216: NEXT
20 FOR XXX=1 TO 2: POKE-16299,0: POKE
   -16300,0: XXX=1: NEXT: REM Experiment
   with different length variable names.
```

BEAGLE BAG

12 APPLE GAMES ON ONE DISK
by BERT KERSEY

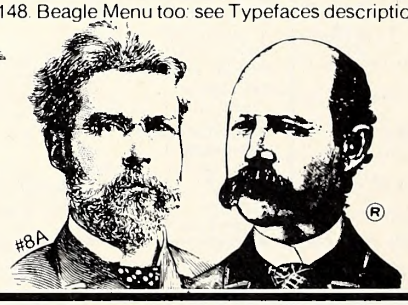
$29.50: Includes Peeks & Pokes Chart

COMPARE BEAGLE BAG with any single-game Locked-Up disk on the market today.

All 12 games are a blast, the price is a bargain, the instructions are crystal clear, *and* the disk is COPYABLE. You can even *change* the programs or list them to learn programming tricks by seeing how they work.

TWELVE GAMES from the Applesoft Ace, Bert Kersey— TextTrain, Wowzo, Magic Pack, Buzzword, Slippery Digits, and many many more...

EXCELLENT REVIEWS—See Jan-83 *Softalk*, p.148. Beagle Menu too: see Typefaces description.



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(Don't Settle for Less!)

*DISKQUIK requires Apple IIe.

"APPLE" is a Registered Trade Mark of You-Know-Who.

NEW! SILICON SALAD

INCLUDING TIP DISK #2
by BERT KERSEY and MARK SIMONSEN

$24.95: Includes Peeks/Pokes AND Commands Charts

MANY MINI-UTILITIES: **Disk Scanner** finds bad disk sectors, **Key-Clicker** adds subtle sound as you type, **DOS-Killer** adds two tracks of space to your disks, **2-Track Cat** allows up to 210 file names per disk, **Program Splitter** makes room for hi-res pix with large Applesoft programs, **Text Imprinter** transfers text to the hi-res screen, **Onerr Tell Me** prints the appropriate error message but continues program execution, **Text Screen Formatter** converts text layouts into Print statements... plus much more Apple wizardry from the boys at Beagle Bros.

MORE TIPS ON DISK: Including fantastic programming tricks from Beagle Bros Tip Books 5, 6 and 7, plus programs from Tips/Tricks Chart #1.

TWO-LINERS TOO: From our customers around the world—and elsewhere. Little mind-blowers that will teach your old Apple some new tricks!

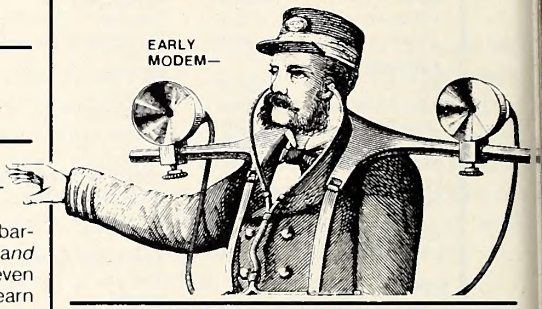
TIP DISK #1

100 TIP BOOK TIPS ON DISK
by BERT KERSEY

$20.00: Includes Peeks & Pokes Chart.

100 LISTABLE PROGRAMS from Beagle Bros Tip Books 1-4. Make your Apple do things it's never done! All 100 programs are LISTable and changeable for Apple experimentation.

COMMAND CHART INCLUDED: Free with each Tip Disk; an 11 x 17 poster of all Applesoft, Integer Basic & DOS Commands with Descriptions!



FLEX TYPE

(FORMERLY "FLEX TEXT")
VARIABLE-WIDTH HI-RES TEXT UTILITY
by MARK SIMONSEN

$29.50: Includes Peeks & Pokes Chart

PRINT VARIABLE-WIDTH TEXT on both hi-res screens with normal Applesoft commands (including HTAB 1-70). Normal, expanded & compressed text with no extra hardware. (70-column text requires a monochrome monitor, not a tv).

ADD GRAPHICS TO TEXT or add Text to hi-res graphics. Run your existing Applesoft programs under Flex Type control. Fast, easy to use, and Compatible with GPLE and Double-Take.

DOS TOOL KIT® font compatibility, or use the supplied Flex Type typefaces. Select up to 9 fonts with control-key commands. A text character editor lets you redesign any Apple text character.

FRAME-UP

FAST APPLE DISPLAY UTILITY
by TOM WEISHAAR

$29.50: Includes Peeks & Pokes Chart

PROFESSIONAL PRESENTATIONS: Turn your existing Hi-Res, Lo-Res and Text frames into attractive Apple "slide shows". *FAST* hi-res loads in 2½-seconds! Paddle or Keyboard-advance frames.

UNATTENDED SHOWS are optional, with each picture arranged and pre-programmed to display on the screen from 1 to 99 seconds. Custom **Text Screen Editor** lets you create black-and-white text "slides" and add type "live" from the keyboard during shows. Mail copies of presentations on disk to your friends and associates (or home to Mom!).

NEW! GPLE

GLOBAL PROGRAM LINE EDITOR
by NEIL KONZEN

$49.95: Includes Peeks/Pokes Chart & Tip Book #7.

A CLASSIC APPLE PROGRAM EDITOR GPLE lets you edit Applesoft program lines *FAST* without awkward cursor-tracing and "escape editing".

INSERT & DELETE: GPLE works like a word processor for Applesoft program lines. You make changes instantly by jumping the cursor to the change point and inserting or deleting text. No need to trace to the end of a line before hitting Return.

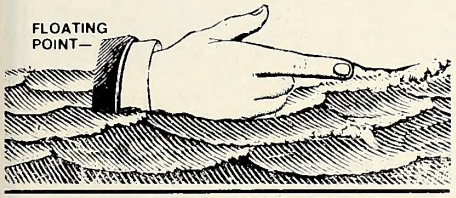
GLOBAL SEARCH & REPLACE: Find any word or variable in your programs, *FAST*. For example, find all lines containing a GOSUB, or edit or delete all lines with REM statements, or all occurrences of any variable. **Replace any variable**, word or character with any other. For example, change all X's to ABC's, or all "Horse" strings to "Cow".

80-COLUMN COMPATIBILITY: All edit & global features support **Apple IIe 80-column cards** and most 80-column cards on *any* Apple IIe, II+ or II.

DEFINABLE ESC FUNCTIONS: Define ESC plus any key to perform any task. For example, **ESC-1** can catalog drive 1, **ESC-L** can do a "HOME: LIST", **ESC-N** could type an entire subroutine... *Anything* you want, *whenever* you want.

GPLE DOS MOVER: Move DOS and GPLE to Language Card (or IIe upper 16K) for an EXTRA **10,000 Bytes** (10K) of programmable memory.

Plus APPLE TIP BOOK #7: Learn more about your Apple! Includes all new GPLE tips and tricks.



UTILITY CITY

21 PROGRAMMING UTILITIES
by BERT KERSEY

$29.50: Includes Peeks/Pokes Chart & Tip Book #3

LIST FORMATTER prints each program statement on a new line. Loops indented with printer Page Breaks. A great Applesoft program de-bugger.

MULTI-COLUMN CATALOGS, with or without sector and file codes. Organize your disk library.

INVISIBLE and trick catalog file names. Invisible functioning commands in Applesoft programs too.

MUCH MORE: 21 utilities, including auto-post Run-number & Date in programs, alphabetize/store info on disk, convert dec to hex or Int to FP, protect and append programs, dump text to printer...

LEARN PROGRAMMING: List-able programs and informative documentation. Includes Tip Book #3. Hours of good reading & Applesoft experiments.

ALPHA PLOT

HI-RES GRAPHICS/TEXT UTILITY
by BERT KERSEY and JACK CASSIDY

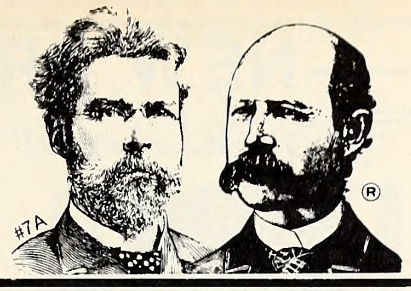
$39.50: Includes Peeks/Pokes Chart & Tip Book #4.

DRAW IN HI-RES on both Apple "pages" using easy keyboard commands OR paddles/joystick. Pre-view lines before plotting. Solid or mixed colors & Reverse (background-opposite) drawing. FAST one-keystroke circles, boxes & ellipses, filled or outlined. Add text for graphs & charts. All pix Save-able to disk, to be called from your Applesoft programs.

COMPRESS HI-RES DATA to 1/3 disk space (average) allowing more hi-res pictures per disk.

MANIPULATE IMAGES: Superimpose any two images, or RE-LOCATE any rectangular section of any drawing anywhere on either hi-res page.

HI-RES TYPE: Add text to your pictures with adjustable character-size and large-character color. Type *anywhere* with no Htab/Vtab limits. Type sideways too, for graphs. Includes Tip Book #4.



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* DISKQUIK requires Apple IIe.
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BEAGLE BASIC

APPLESOFT ENHANCER
by MARK SIMONSEN

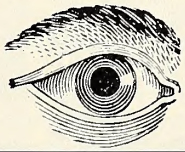
$34.95: Includes Peeks/Pokes Chart & Tip Book #6. Requires Apple IIe (OR II/II+ with RAM Card).

RENAME ANY APPLESOFT COMMAND or Error Message to anything you want. For program clarification, encryption/protection or even foreign translation. Plus add optional NEW COMMANDS:

ELSE follows If-Then statements, like this:
IF X=2 THEN PRINT "YES": *ELSE* PRINT "NO"

HSCRN reads color of any hi-res dot for collision testing. **SWAP X,Y** exchanges 2 variables' values. New **TONE** command writes music with no messy pokes & calls. **SCRL** scrolls text in *either* direction. **TXT2** lets Text Page 2 act exactly like Page 1.

PLUS: GOTO & GOSUB may precede variables, as in "GOSUB FIX" or "GOTO 4+X". Escape-mode indicated by special ESC CURSOR. Replace awkward Graphics screen-switch pokes with 1-word commands. Change ctrl-G Beep to any tone. **INVERSE REMS** too! All GPLE compatible.



```
1 FOR S=768 TO 773: READ A:
  POKE S,A: NEXT: POKE 232,0:
  POKE 233,3: DATA 1,0,4,0,5,0
2 HGR2: FOR R=0 TO 192: ROT=R:
  SCALE=96: XDRAW 1 AT 140,95:
  SCALE=30: XDRAW 1 AT 140,95:
  S=PEEK(49200): NEXT: RUN
```

PRONTO-DOS

HIGH-SPEED DOS / DOS-MOVE UTILITY
by TOM WEISHAAR

$29.50: Includes Peeks & Pokes Chart

TRIPLES THE SPEED of disk access and frees 10,000 bytes of extra memory by moving DOS.

Function	Normal	Pronto
BLOAD HI-RES IMAGE	10 sec.	3 sec.
LOAD 60-SECTOR PROGRAM	16 sec.	4 sec.
SAVE 60-SECTOR PROGRAM	24 sec.	9 sec.
BLOAD LANGUAGE CARD	13 sec.	4 sec.
(Text Files: No Change)		

Boot the Pronto disk or your updated disks, created with the normal INIT command. Compatible with all DOS Commands, GPLE, Double-Take, DOS Boss, DiskQuik and almost all unprotected programs.

MOVE DOS to your Language Card, RAM Card, or standard Apple IIe upper 16K, freeing up **10,000 EXTRA BYTES** of memory for your programs.

15 EXTRA SECTORS per disk. Catalog Free-Space displayed every time you catalog a disk.

TYPE-COMMAND ("TYPE filename") prints contents of sequential Text Files on screen or printer.

NEW! DISKQUIK

DISK DRIVE EMULATOR
by HARRY BRUCE and GENE HITE

$29.50: Includes Peeks & Pokes Chart
Requires Apple IIe with Extended 80-column Card.

ACTS LIKE A DISK DRIVE in Slot 3, but much faster, quieter, more reliable and $350+ cheaper! Enjoy the benefits of a 2nd (or 3rd or 4th...) drive at less than 1/10th the price. Catalogs normally with "CATALOG, S3" command. Load & Save any kind of files into RAM with normal DOS commands.

SILENT AND FAST: Since no moving parts are involved, DiskQuik operates silently and at super-high speeds. See it to believe it. Your Apple IIe's Extended 80-column Card (required) can hold about half the amount of data as a 5¼" floppy disk!

MANY USES: For example, auto-load often-used files like FID etc., etc., into RAM when you boot up, so they are always available when you need them. Copy files from RAM onto disk and vice versa, just as if a disk drive were connected to slot #3.

FRIENDLY & COMPATIBLE with 80-column display, GPLE, ProntoDOS, and all normal Applesoft and DOS commands and procedures. Will not interfere with Apple IIe "Double Hi-Res" graphics.

DOUBLE-TAKE

2-WAY-SCROLL/MULTIPLE UTILITY
by MARK SIMONSEN

$34.95: Includes Peeks/Pokes AND Tips/Tricks Charts.

2-WAY SCROLLING: Listings & Catalogs scroll Up AND Down, making file names and program lines much easier to access. Change the Catalog or List scroll-direction at will, with Apple's Arrow keys.

80-COLUMN COMPATIBLE: All features support IIe and most other 80-column cards.

BETTER LIST FORMAT: Each program statement lists on a new line for *FAST* program tracing & de-bugging. Printer-compatible; any column-width.

VARIABLE-DISPLAY: Displays all of a program's strings and variables with current values.

CROSS-REFERENCE: Sorts and displays line numbers where each variable & string appears.

AUTO-LINE-NUMBER, Hex/Dec Converter, better Renumber/Append, Program Stats, Change Cursor, Space-On-Disk. GPLE/Pronto compatible.

☐ Alpha Plot	$39.50	☐ Frame-Up	$29.50
☐ Apple Mechanic	29.50	☐ GPLE	49.95
☐ A.M.Typefaces	20.00	☐ ProntoDOS	29.50
☐ Beagle Bag	29.50	☐ Silicon Salad	24.95
☐ Beagle BASIC	34.95	☐ Tip Disk #1	20.00
☐ DiskQuik	29.50	☐ Utility City	29.50
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☐ Double-Take	34.95	☐ ADD ME to mailing list	
☐ Flex Type	29.50	☐ ALREADY ON mail list	

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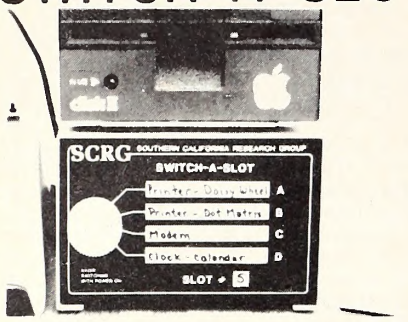
SCRG

SWITCH-A-SLOT



The **SWITCH-A-SLOT** is an expansion chassis, which allows the user to plug in up to four peripheral cards at one time. One of these cards is selected for use, and only that card draws power.

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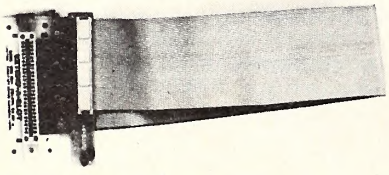

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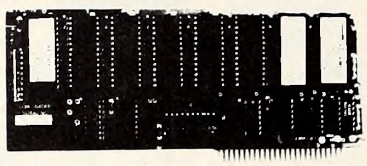
NEW PRODUCT

quikLoader



Designed by Jim Sather

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The quikLoader is the *fastest* way to load programs, ***BAR NONE!*** Applesoft, Integer, or machine language programs can be loaded in fractions of a second. More importantly, DOS is instantly loaded every time the computer is turned on. Integer is even loaded in the language card. This process takes less than a second, saving valuable time. The quikLoader operating system can keep track of over 250 programs stored in **PROM**s (Programmable Read Only Memory). The user simply transfers any of these programs to PROM using the instructions packed with the unit, and any PROM programmer, or we will provide this service.

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How many times have you started to work with a frequently used program, only to find that you have misplaced the disk, or worse, had the disk damaged, or the dreaded "I/O ERROR" message flash on the screen. With the quikLoader, these nightmares can be a thing of the past. Frequently used programs are available *instantly* when you need them, without having to look for the disk, or hoping that the lengthy disk loading procedure goes smoothly. If you do need to use standard disks, the quikLoader even speeds up that process. For example, to catalog a disk, just press ctrl-C Reset. To run the "HELLO" program, press crtl-H Reset.Other "one-key" commands include entering the monitor, booting the disk, calling up the mini-assembler, etc. The major difference between the quikLoader and the other ROM cards is the complete operating system (in PROM). This enables you to get the quikLoader catalog on the screen (by pressing ctrl-Q Reset), allowing you to see what programs are available. Loading or running of the desired program requires one keypress. Program parameters, such as starting address and length of machine language programs can be seen on the catalog screen, if desired.

VERSATILE

The quikLoader will accept any of the popular PROMS available on the market, 2716, 2732, 2764, 27128 and 27256. These types may be freely intermixed on the card. Long programs can take up more than one PROM, or several short programs may be stored on one PROM. The quikLoader operating system even handles multiple cards, so you can easily double or triple the amount of PROM memory available. The ultimate memory capacity of one card is 256K, so many frequently used programs and utilities can be stored. We even start your library of programs with the most popular utilities on the card, FID and COPYA. Now, if you have to copy a disk, you don't have to search for the master disk. You can start copying within 3 seconds after turning on the computer.

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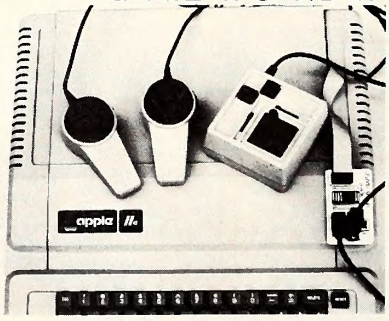

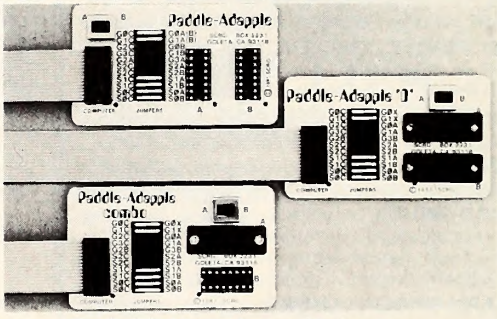

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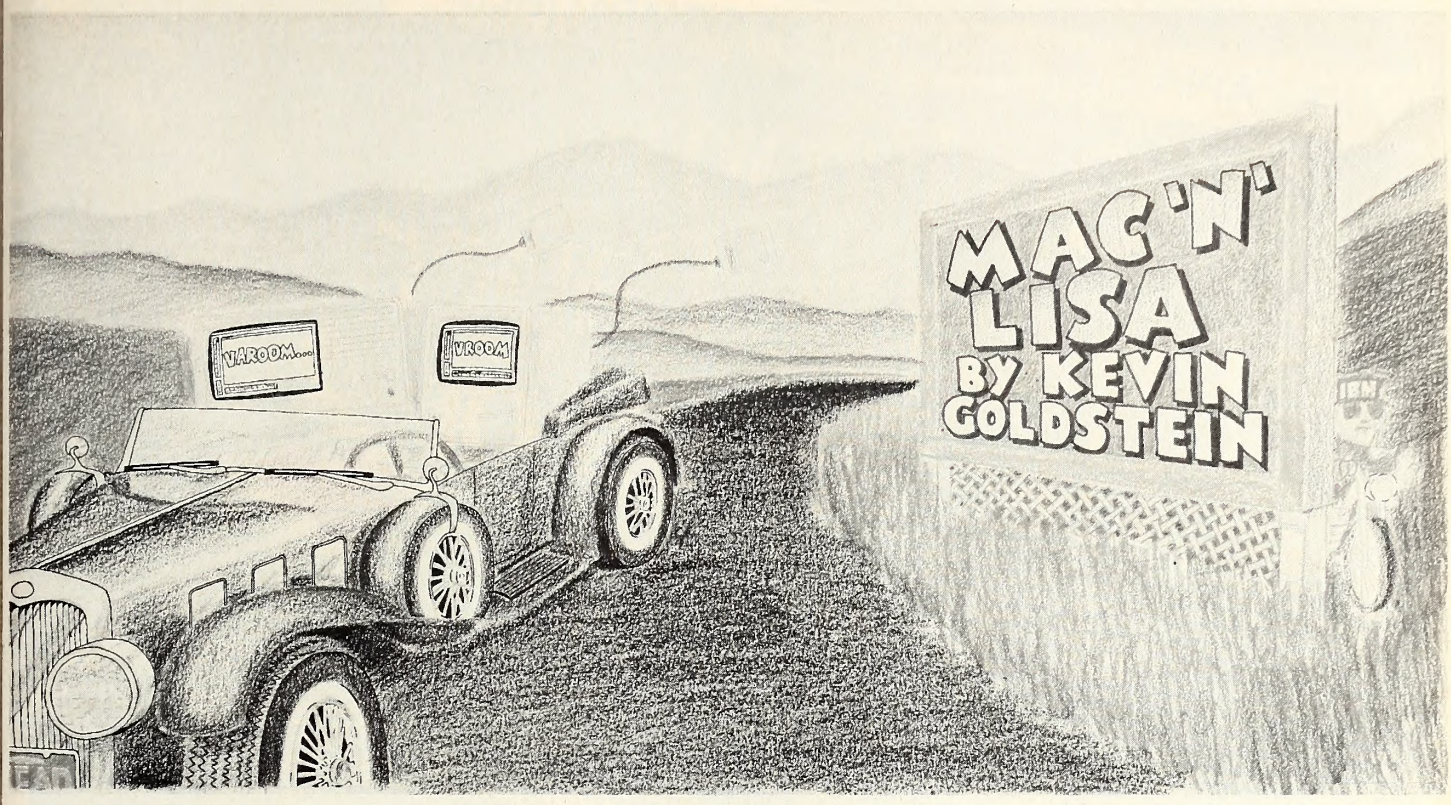

Mac Sits Junior in the Corner

Mac is rather upset with Lisa. Seems he thinks she's been two-timing him . . . something about appearing at Maxwell's Apple with some character named Unix.

What? Mac'n'Lisa's not a soap opera? Really must change that title. How does 32-Bit sound? (Just don't drop the "3," folks. Wouldn't be good to be known as a two-bit editor.)

Actually, Mac should be pretty happy. He's been absolutely creaming the competition. Of course, when the press sets up as your competition a sawed-off chunk of metal depending on its father's reputation, with a keyboard that looks like someone put it together with parts from a chewing gum box, it's no real achievement to knock its socks off.

Seriously, though, this whole routine of the press—and here we're speaking of the popular press, meaning *Newsweek*, *Time*, local newspapers, and the like—setting up the PC*jr* as Mac's competition is . . . a little *odd*. In terms of both capabilities and price, the reasonable comparison is between Mac and the full-size PC. In fact, the principal reason the press is stacking Mac up against Junior is that the two machines were introduced at approximately the same time.

There is, however, a *soupcon* of sense in comparing Junior with Mac: Both machines have as one of their marketing targets the home user. Junior, which has been highly—and somewhat erroneously—touted as being compatible with the full-size PC, is expected to be used widely by businesspeople working at home. Which is amusing, considering that the business types have been passing up Junior because it—and its keyboard—looks (and feels) like a toy. On the other hand, early indications are that the Fortune 500 types—a market that Apple professes Mac is not pursuing at this time—are giving Mac serious consideration. They're even buying some. Peat, Marwick, Mitchell and Company, a nationwide accounting firm (you can't get any more pin-striped than that), has ordered *3,500* machines; Businessland (guess what market they concentrate on) is adding Mac and Lisa to its catalog, as is Genra; and it looks as though ComputerLand and Sears (the two prime retailers of the IBM PC) may be joining the Mac camp.

If you haven't guessed it by now, Mac is selling like hot cakes, Junior is selling like flop cakes. Many Mac dealers are quoting four-month delivery times and have back orders of close to a hundred machines, which makes Apple's projected first-year sales of 350,000 to half a million look not only possible, but likely. (Especially considering that those early sales are coming in the face of little currently available software, no second disk, and only 128K of memory.) Mac's popularity is already starting to buoy Lisa sales, and the next thing the press is going to start arguing is whether Mac can successfully tackle the PC itself. A silly question, because it's already doing just that.

Some of the students who've been fortunate enough to purchase Macs under Apple's Apple University Consortium plan, which lets a college purchase Macs in volume at deep discounts for resale to their students (or faculty), have been causing a big brouhaha by *reselling* the machines at a healthy profit. Some of the buyers have themselves been retailers. It's not so much that the machines purchased through the university connection are necessarily cheaper than the dealers can get them from Apple, just that they are available *now*. Both Apple and the colleges are highly unimpressed with this ad hoc adventure in capitalism, so it's likely that the practice will at least go underground, if it can't be stopped altogether.

Tech Corner. Don't say you weren't warned: Last month's Tech Corner started with the caveat: for pioneers only—no calls if it doesn't work.

Ah, such prescience. If you tried it—making a cable to connect your Mac to a standard modem—you by now know that . . . it didn't work. Seems the polarity of the data was reversed: You want to pick off pins 5 and 9 from the Mac phone connector, not pins 4 and 8 as indicated. With that done, the cable will work just fine—we actually got off our duffs and built one, so we know whereof we speak. Incidentally, if you've purchased one of the new Apple modems, you can find a Mac-to-Apple modem cable diagram in the May issue of *ST.Mac*, *Softalk*'s sister publication dedicated to Mac and Lisa.

While we're on the subject of other publications about Mac, there are four books already out. From Doug Clapp has come *Macintosh! Complete*, published by none other than Softalk Books, and from Cary Lu, via Microsoft Press, *The Apple Macintosh Book*. dilithium Press has chipped in with *Presenting the Mac*, by Merl Miller and Mary Myers, and Edward Connolly and Philip Lieberman have put together *Introducing the Apple Macintosh*, from Howard W. Sams. None of the books is particularly technical, but all should appease a heavy Mac attack for at least a while. Clapp's book is of course our favorite, but then we're prejudiced. Maybe. Lu's is also excellent, though not quite as witty. Buy all four and decide for yourself.■

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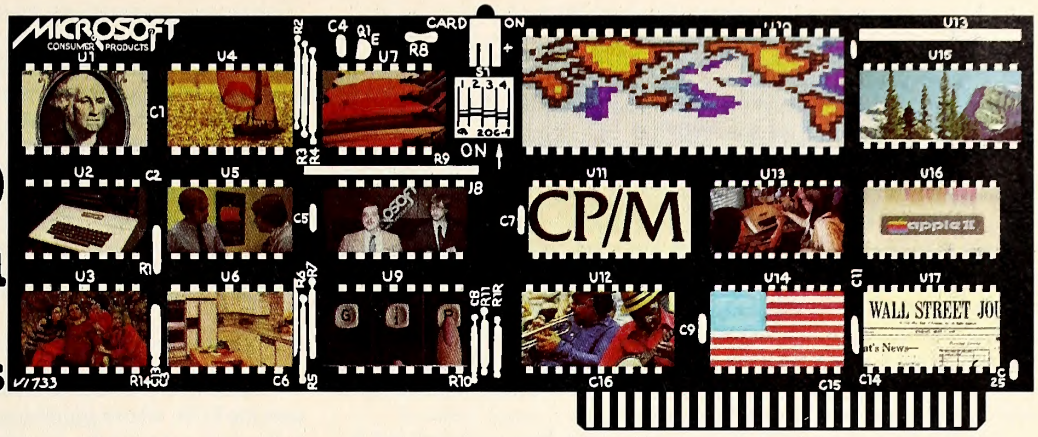

The File-Related BDOS Functions

Welcome to the May edition of Softcard Symposium. In March's column, we set the stage for the examination of the final set of BDOS function calls by discussing the structure of disk-file access under CP/M. We are now, therefore, ready to proceed with the BDOS functions related to the handling of disk files. In February's column we displayed all twenty-five of the disk functions and then separated out those that were not file-related. This month, we'll display only the sixteen file-related functions, as shown in figure 1. Note that they are not in numerical order. Also, since most of those functions are simple to implement, we'll hold off on showing the subroutine library additions until our discussion is complete.

The first function in our list is *set DMA address*:

BDOS function no:	26
Function name:	Set DMA address
Function purpose:	Set the memory address for disk I/O
Entry parameters:	[C] = 1AH
	[DE] = DMA address
Exit parameters:	none

To refresh our memories (no pun intended), the term DMA stands for direct memory access. It usually describes hardware that can fill memory with data from some outside source (usually a disk) or take data directly from memory and send it to an outside source—all this without involving the processor at all. The hardware technicalities of this are beyond the scope of this column; suffice it to say that DMA hardware allows the processor to be more efficient, since it frees the processor to carry on other activities during disk or peripheral accesses.

In systems without DMA hardware, the term DMA has no formal meaning. However, it has taken on a slang meaning in CP/M that has, over time, acquired the status of a permanent definition. DMA in CP/M has come to mean the starting address of the block of memory that will be filled with data from disk, or from which data is taken to be written to disk. Recognize that the DMA address is the single address at which this process will start. The other 127 addresses within this block of memory are unimportant. CP/M (BDOS and BIOS) will take care of any incrementing of addresses necessary to fill the entire block.

BDOS keeps track of the current DMA address using a memory location inside itself. When the system is booted, the DMA address is initialized to an address of 0080H (the location of the default buffer in the system data page). The DMA address is changed almost constantly by the CCP and other utility programs as they fill and copy memory with disk reads and writes. However, it is usually returned to the default location (0080H) when a program exits, and it is always returned there at the completion of any operation of the CCP.

In normal operation, function 26 is only used when reading and writing large blocks of data—such as are present when a file (or large portion of a file) is being moved between memory and the disk. The standard practice in such cases is to initialize the DMA address to the starting address of your memory buffer and save it. Then, at the completion of each successful disk read or write, the old address is restored, 128 bytes are added to increment it beyond the last data used, and function 26 is called to inform BDOS. This is required no matter which form of access—random or sequential—is being used.

The alternate method of reading or writing large data blocks is to use the default DMA buffer (0080H) for all reads and writes and simply to move the data between the default DMA buffer and your own memory buffer 128 bytes at a time. But because of the additional work this scheme requires of the processor (in moving all this data), this method is much less efficient.

In your own programming, you must always be aware of the current DMA location. Since there's no function to inform you of the current location, it's always advisable to take the safe route—explicitly setting the DMA address before performing disk access and then keeping track of its location as you alter it. So long as your program is running without interruption, the DMA address will be altered only if your program calls function 26. No other action of BDOS or your program can reset it.

Function	Name	Operation
26.	Set DMA address	Establishes the starting address in memory from which the next record will be written to disk or to which the next sector will be read from disk
17.	Search first	Finds a directory entry corresponding to the specified FCB
18.	Search next	Finds subsequent entries corresponding to the specified FCB
22.	Make file	Creates a new disk file by creating a directory entry corresponding to the specified FCB
19.	Delete file	Deactivates all directory entries corresponding to the specified FCB
23.	Rename file	Changes the name of all directory entries corresponding to the first sixteen bytes of the FCB to the name contained in the second sixteen bytes of the FCB
30.	Set attributes	Sets the requested attribute (SYS-DIR and R/O-R/W) for a particular file (also changes any other parity bits requested)
15.	Open file	Activates an FCB for the disk file
16.	Close file	Deactivates an FCB for a previously open disk file
20.	Read sequential	Obtains one record from the file identified by the activated FCB—record is CR from extent EX
21.	Write sequential	Sends one record to the file identified by the activated FCB—record is CR in extent EX
33.	Read random	Obtains one record from the file identified by the activated FCB—record is RL-RH
34.	Write random	Sends one record to the file identified by the activated FCB—record is RL-RH
40.	Write random with zero fill	Essentially equivalent to function 34, except that unallocated blocks are filled with 0s prior to the write
35.	Compute size	Obtains a value that is 1 beyond the highest numbered record in the file
36.	Set random rec.	Computes the random record number and sets it in RL-RH in the FCB for the current values of EX and CR in the FCB

Figure 1. File-related disk functions.

The next function we'll examine is *search for first*:

BDOS function no:	17
Function name:	Search for first
Function purpose:	Find the first directory entry matching the specified FCB
Entry parameters:	[C] = 11H [DE] = FCB address
Exit parameters:	[A] = directory code

This function is the means by which the directory is examined. It is used by the CCP and by any CP/M program that searches for directory entries. In response to this call, BDOS scans the directory of a disk, starting with the first directory sector. It examines each entry in the directory to find a match with the FCB whose address is contained in the [DE] register pair. (As we continue, refer to the March column for a description of the FCB and its fields.)

The DR field of the FCB is not used for matching purposes, but instead determines which disk is to be searched. A drive number of from 1 to 16 (drives A through P) causes that disk to be logged in and searched. If no drive is specified (a DR field value of 0), the currently logged disk is searched.

A match occurs when bytes 1 through 12 (the F1-F8, T1-T3, and EX fields) and byte 14 (DM) of the directory entry are equal to the same bytes in the FCB. BDOS continues comparing entries to the FCB until a match is found or until there are no more entries to be compared. Note that byte 13 (S1) is not used for comparison purposes and that BDOS automatically zeros the DM field of your FCB during this function. A question mark in any character position of the F1-F8, T1-T3, or EX fields in your FCB will cause an automatic match with any value in that same position in the directory entry.

Normally, only active (nondeleted) directory entries that are in the current user area will be matched; however, a question mark in byte 0 of your FCB (the DR field) will remove these restrictions. Setting DR to a question mark also disables the auto disk select function and specifies that only the currently logged drive is eligible to be searched. Further, when DR contains a question mark, the DM field is not set to 0. Using the wildcard character in DR, then, has the effect of identifying any directory entry that matches the remaining fields, including deleted files and files in any user area. This capability can be of special value in programs that create disk usage maps for the currently logged drive.

Function 17 returns a 0FFH in register [A] if no match was made between your FCB and any directory entry. If there was a match, however, BDOS returns a value from 0 to 3, which is called a *directory code*. The directory code is more than just an indication that a match occurred. It is used to access the actual directory information in the matched entry.

When a match is made, BDOS places the logical directory sector (128 bytes) in which the entry was found at the current DMA address. The directory code is the relative position of the directory entry within that logical sector—there are four entries in each sector and four possible directory code values. A code of 0 indicates the first entry, a 1 means the second entry, and so on. Since each directory entry is thirty-two bytes long, it is relatively simple to locate the entry; you just multiply the directory code by 32 and add the result to the current DMA address. At that point, any information within the entry can be extracted and put to use.

The next function to look at is *search for next*:

BDOS function no:	18
Function name:	Search for next
Function purpose:	Find any subsequent directory entry matching the FCB
Entry parameters:	[C] = 12H [DE] = FCB address
Exit parameters:	[A] = directory code

This function is identical to search for first except that BDOS starts with the directory sector in which the last match was found and continues to search for further matches. As a result, the two functions are always used in combination—function 17 to have BDOS start at the beginning of the directory (or find a single file), and function 18 to continue to search for additional files matching the FCB.

Most general-purpose directory programs use a file reference consisting entirely of wildcard characters (???????????), with EX equal to 0. In this way, a match is made with the first extent of any file encountered. Continuing the search with function 18 allows a complete list of all active files in a given user area to be made. Directory programs that calculate file space used can set EX to a question mark as well and then search for all extents of each file. When the list is complete, the extent number and the RC field of the final extent can be used to calculate the record count for each file.

The next function is *make file*:

BDOS function no:	22
Function name:	Make file
Function purpose:	Create a new directory entry from FCB
Entry parameters:	[C] = 16H [DE] = FCB address
Exit parameters:	[A] = directory code

This function is used to create a new file on disk. Specifically, BDOS uses the FCB, whose address is passed in the [DE] register pair, to create a directory entry on the drive specified or on the logged drive if none is specified. Since the directory entry is being created strictly from the FCB, no wildcard characters (question marks) are allowed in the DR, F1-F8, T1-T3, or EX fields for this function.

During the performance of this function, BDOS won't exclude duplicate entries. Consequently, the programmer must make sure that the file being created does not duplicate a file already in the directory of the disk. To be absolutely safe, a delete-file function call can be made prior to the make-file function call to ensure that any existing file with these attributes is removed.

Finally, BDOS initializes all values in the new entry (and the FCB used to create it) to those of an empty extent (EX=0, RC=0, and so on). This process of filling in the FCB from the directory entry is identical to opening the file, so an open-file function call is not required when the make file function is used. BDOS returns the directory code of from 0 to 3 in register [A] if the operation is successful, or a value of 0FFH in [A] if no more directory space remained on the disk.

The next function to examine is *delete file*:

BDOS function no:	19
Function name:	Delete file
Function purpose:	Deactivate the file named by the FCB
Entry parameters:	[C] = 13H [DE] = FCB address
Exit parameters:	[A] = directory code

Although the name of this function is delete file, it does not delete the file in the true sense of the word. Instead, it deactivates all extents of the named file and returns the space they occupy to unallocated status. In this way, the space is made available for new storage.

In response to this function, BDOS performs a search of the directory of the drive specified in the FCB or of the logged drive if none is specified. All directory entries that match the F1-F8 and T1-T3 fields of the referenced FCB are deactivated. This is accomplished by setting the first byte of each entry (the field containing the user number) to a value of 0E5H. Such a value in this byte of any directory entry causes BDOS to assume the entry is empty in any future access. As a result, BDOS won't attempt to match these entries in any future directory searches and will use them whenever new extents must be created.

The FCB used for function 19 may have wildcard characters in any of the F1-F8 and T1-T3 character positions. This makes it possible to delete groups of files with a single function call. The DR field, however, may not contain a question mark character and must indicate either the drive to be searched or the logged drive (DR=0). If the operation is successful, the [A] register contains the standard directory code seen earlier. If no file is found that corresponds to the referenced FCB, a value of 0FFH is returned in [A].

The next function we'll examine is *rename file*:

BDOS function no:	23
Function name:	Rename file
Function purpose:	Alter the name of a referenced file
Entry parameters:	[C] = 17H [DE]= FCB address
Exit parameters:	[A] = directory code

This function is used to change the name (fields F1-F8 and T1-T3) of a given file. To accomplish this, function 23 uses a special sort of FCB.

The first sixteen bytes of the FCB contain the file's current name, while the second sixteen bytes contain the name your program is changing it to. During the operation of this function, all extents in the directory that match the current name fields in the FCB will be altered.

The DR field in the first sixteen bytes specifies the drive on which the action is to take place, just as it has with previous functions. The DR field in the second sixteen bytes is not used, however, and should be set to 0 by your program. A successful rename returns the standard directory code in [A], while a 0FFH is returned in [A] if no occurrence of the original file could be found.

The next function to examine is *set file attributes*:

BDOS function no:	30
Function name:	Set file attributes
Function purpose:	Set R/O–R/W and DIR–SYS status
Entry parameters:	[C] = 1EH
	[DE] = FCB address
Exit parameters:	[A] = directory code

The set file attributes function is the means by which the read/only and read/write attributes are set or cleared for a particular file. As we discussed last time, these attributes are controlled by the parity bits of the filetype characters T1 and T2 respectively; bit 7 is set if the attributes are active and reset if the attributes are inactive.

To use this function, your program simply creates an FCB (no wildcard characters allowed), with the desired bits set or reset as appropriate, and invokes the function. BDOS will respond by searching the indicated disk directory for matches with the specified FCB. The parity bits of the characters, however, will not be used for matching purposes. As each match is found, BDOS copies the parity bits of the F1–F8 and T1–T3 fields into the directory entry from your FCB. Once again, a directory code is returned in [A] if the operation was successful, while a 0FFH is returned if the referenced file could not be found.

Note that the parity bits of any of the F1–F8 and T1–T3 characters can be changed using this function. However, only the first four characters of the filename and the first two characters of the filetype should be altered. Although the remaining five are currently undefined, they are used by BDOS for matching purposes during directory searches. Consequently, since standard utilities do not set them, the result of changing these characters could be files that cannot be accessed using normal methods.

The next function we'll examine is *open file*:

BDOS function no:	15
Function name:	Open file
Function purpose:	Activate the FCB for the named file
Entry parameters:	[C] = 0FH
	[DE] = FCB address
Exit parameters:	[A] = directory code

As we alluded to in examining the make file function, opening a file involves activating an in-memory FCB describing it. Function 15, therefore, first causes BDOS to attempt to find a directory entry on the specified or logged disk that matches the F1–F8, T1–T3, and EX fields of the referenced FCB. If a match is found, BDOS then activates the FCB by filling in its missing information (DM, RC, and BA–BP). Once this has been done, BDOS can access the file correctly using the now active FCB.

Note that during the performance of this function the extent field of the FCB is used for matching purposes, making it possible to open each extent of a file individually. You'll recall from our discussion in the March column that different extents of a file are almost like separate files in themselves. Each extent must be opened before it can be accessed. Under normal circumstances, BDOS itself takes care of closing the current extent and opening a new one automatically. If, however, you're performing some or all of these operations manually in your program, you must be constantly aware of the extent in use and perform the necessary open and close operations.

During the open file function, wildcard characters are allowed in the F1–F8, T1–T3, and EX fields and will cause the first matching file to be opened. It is difficult, however, to see the value in opening a file whose name you do not know. In such a case, the FCB would be activated from the first directory entry matching the partial FCB. Missing information in name fields would be filled in too. Use this feature with caution.

At the successful completion of function 15, the directory code corresponding to the now open file is returned in register [A]. If no matching file exists in the directory, a value of 0FFH is returned in [A] to indicate the error. Of course, if no match is made, no alteration of the FCB fields occurs.

It cannot be stressed too often that a file must not be accessed for read/write operations until either a successful open file operation or a make file operation has been performed to activate the FCB. One additional word of warning: BDOS also initializes other data locations within itself in response to the open-file and make-file function calls. Simply setting up the FCB with all information, therefore, is not sufficient when you wish to begin read/write access.

The next function is *close file*:

BDOS function no:	16
Function name:	Close file
Function purpose:	Deactivate the FCB for the named file
Entry parameters:	[C] = 10H
	[DE] = FCB address
Exit parameters:	[A] = directory code

The close file function is the opposite of the open function. When the close file function is issued, the referenced FCB is used to update the appropriate directory entry on the disk with any altered information and status. The FCB must have been activated with a prior open-file or make-file function call. As was so with the open function, question marks may be used here in the name and extent fields. The returned values for the close file function are the same as most that we've looked at so far; [A] contains a directory code if the operation was successful or a 0FFH if the referenced file could not be found.

Since the purpose of the close file function is to update the directory entry from the FCB, it's mandatory to make this call whenever a file has been written to. In this way, new blocks that have been allocated in the block list (the BA–BP fields) and new records added to the record count (the RC field) will be permanently recorded. Although Digital Research

indicates that the close function is not necessary when nothing but read operations have been performed on the file, the safest way to handle files in your programs is always to close open files, regardless of what action has been performed on them.

The next function to look at is *read sequential*:

BDOS function no:	20
Function name:	Read sequential
Function purpose:	Read CR from the file named in FCB
Entry parameters:	[C] = 14H
	[DE] = FCB address
Exit parameters:	[A] = error code

This function causes a 128-byte record of the referenced disk file to be transferred from disk to memory at the current DMA address. The FCB whose address is passed in the [DE] register pair must have been activated by a previous make-file or open-file function call. At that point, all of the fields of the FCB except the record number fields CR (sequential) and RL-RH (random) will have been initialized to the proper values for this extent of the file. All that remains, then, is for the record number field to be set to the required value and the function initiated. In response to function 20, BDOS will read the single 128-byte sector (CR) from the current extent number (EX) shown in the FCB.

As we mentioned in March, this function is normally used to access a file sector-by-sector from the beginning. To use the function in this fashion, the programmer need only set the CR field to 0 before the first call. From then on, BDOS will automatically increment the CR field at the completion of each successful call to this function. If during this incrementing process the CR field exceeds the total record count (RC), BDOS will close the current extent, increment the extent number (EX), and open the next extent.

Since CR and EX are automatically updated after each read, function 20 may be called repeatedly to read the remainder of the file with no further manipulation of the FCB. Since BDOS does not automatically adjust the DMA address the way it does CR and EX, if no other BDOS functions are used, then each logical sector that is read will overwrite in memory the sector previously read. This approach gives the program access to each new sector at the same memory address.

If, on the other hand, it's necessary for more than one sector to reside in memory at the same time—as it is when an entire file is being read in, for example—the DMA address must be set to a value 128 bytes beyond its current value, using the set DMA function (see function 26).

Function 20 informs the program of a successful read operation by returning a 0 value in the [A] register. If, however, the end-of-file was encountered before the read could begin, or if some type of fatal disk error (bad sector, bad seek, or whatever) took place, then a nonzero value will be returned in register [A] to inform the program that no valid data was transferred during this function call.

The next function we'll examine is *write sequential*:

BDOS function no:	21
Function name:	Write sequential
Function purpose:	Write CR to the file named in FCB
Entry parameters:	[C] = 15H
	[DE] = FCB address
Exit parameters:	[A] = error code

This function is very similar to read sequential, except that data is being transferred in the opposite direction—from memory to disk. Just as with the read function, the FCB must be activated by an open-file or make-file function call and the CR field must be set to the required record number before the function is initiated. When called to perform function 21, BDOS will transfer a single 128-byte record from the current DMA address to disk as record number CR in extent number EX of the file referenced in the FCB. If the file, extent, and record already exist on the disk, the new data taken from memory will simply overwrite the old data at that record position.

Since it is a sequential operation, function 21 is normally used to write records in numerical order from the beginning of the file. To aid this process, CR and EX are automatically updated and extents closed and opened as necessary at the successful completion of this call. To write sequential records repeatedly from the same memory area, therefore, requires only that the program repeatedly call this function, ensuring that the correct data to be written is in the memory area at the current DMA address before each call. Neither further manipulation of the FCB nor additional BDOS function calls are required.

Alternately, when large blocks of data that exist contiguously in memory are to be written, the DMA address may be set to the start of the block before the first write and then adjusted by 128 bytes prior to each new write (see function 26).

The function informs the program of a successful write by returning a 0 in register [A]. An error condition, such as a full disk or a physical disk error, is reported by returning a nonzero value in [A]. It is very important to remember that regardless of the sequence of events, the close file function must be called when your program has completed its write operations so that the directory will be properly updated.

The next function we'll examine is *read random*:

BDOS function no:	33
Function name:	Read random
Function purpose:	Read RCR from the file named in FCB
Entry parameters:	[C] = 21H
	[DE] = FCB address
Exit parameters:	[A] = error code

The read random function causes BDOS to transfer a single 128-byte record from disk to memory. The data comes from the file named in the activated FCB referenced by [DE] and is placed in memory starting at the current DMA address. So far, it appears that this function is very similar to read sequential, but here's where the similarity ends.

The record that is brought from disk during this function is no longer identified by the program using CR and EX. Rather, it is established by the three bytes of the FCB specified as the RL, RM, and RH fields. During normal access, only fields RL and RM are used, since all random record numbers from the smallest (0) to the largest (65535) can be represented in just two bytes. RH, therefore, indicates overflow beyond the highest valid record, and as such is reserved as an error flag for BDOS (and occasionally even for our programs, as we'll see when we discuss function 35).

As reflected by the fact that CR and EX are no longer used by the

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program, random access of the file requires no reference to extents, records within extents, and so on. Instead, the file is treated as one large collection of records and the program simply calculates the record number to read from among the 65,535 possible. This difference in access method allows complete freedom in file access—any record in the file may be accessed in any order whatsoever simply by setting RL and RM to the record number and calling this function. All calculation and search is handled by BDOS.

It should be pointed out that random access of a file using system calls is not the same as random access in a high-level language such as Basic. There is, for example, no difference in the length and format of individual file records. File records are still 128 bytes in length and still have an associated extent number (EX) and record number within the extent (CR). The only difference between random and sequential usage with system calls is strictly in the method of access—records that have been written randomly may be read sequentially and vice versa.

In actuality, BDOS eventually operates in sequential mode when performing this function. It uses the value supplied in RL and RM to calculate EX and CR values for this record. Using these, it can open the proper extent and read the record number within that extent that corresponds to the random record number requested. It would be possible for a programmer to duplicate the actions of BDOS in this case, performing the calculations of EX and CR and the opening and closing of various extents manually. This would produce the same random-access effect, but since BDOS is willing to do all this automatically there isn't much advantage in doing it yourself.

Although a successful random read is reported by returning a 0 in the [A] register (just the way it's done with sequential reads), BDOS reports errors that occur during random access differently than it reports sequential access errors—the main difference being that there are several more error codes. In the interest of completeness, we will show the extra error codes here, but in reality, your programs can treat any nonzero returned value as an unwritten record error and still be ninety-nine percent accurate most of the time. In any case, there are four possible codes that can be returned if an error is encountered during random read operations:

01—Reading unwritten data
03—Cannot close current extent
04—Seek requested to unwritten extent
06—Seek requested past physical end of disk

These codes are fairly straightforward. An error code of 01 is returned when the extent calculated from RL-RM exists but the specific record calculated within that extent was never written to the file. In short, this means that the program tried to read one of the empty records that can exist in a file created by random access. This is the most common of the possible errors, and the one that your program can probably assume for any nonzero value. Error code 04, on the other hand, indicates that even the extent calculated from RL-RM has never been created in this file. Although it is a different type of error, in almost every sense, it means the same thing—no such record was ever written in this file.

Error code 03 does not result from a problem with the record requested. Instead, it deals with a previous operation. It results from the fact that BDOS had to close an existing open extent (perhaps updating the directory) before it could open the new extent requested. Sometime during the process of closing the extent an error, usually a physical disk error, occurred. Since data may have been lost, and since something is obviously wrong, BDOS proceeds no further with the new operation and returns an error code to indicate trouble.

Last we have error code 06, shown as "seek requested past physical end of disk." That description is somewhat misleading when applied to random reads because it's practically impossible to attempt a read beyond the end of the disk. This is so because the read operation uses only the information compiled during writes to calculate disk sectors to read. Consequently, the read operation will never try to read something that was not previously written. Since no write will have taken place beyond the physical end of disk, there is no way to get this type of error during reads. Instead, error code 06 is used during reads to show that the RH field of the FCB is nonzero, meaning that a random record that exceeds the maximum allowed (65,535) has been requested. This usually means the programmer was not careful about always setting this field of the FCB to 0.

A final point—although as mentioned earlier, BDOS calculates and sets the values of EX and CR in the FCB, it does not increment them at the end of successful random reads the way it does at the end of successful sequential reads. Neither does it increment the values of RL-RM. Reading a series of records in random mode, then, means that you must manually increment the random record number and place the new values into RL and RM yourself.

Also, when switching from random mode to sequential mode, the program should repeat the last read in sequential mode so that CR (and, if necessary, EX) are automatically incremented before proceeding. Although you can increment CR manually before proceeding with sequential access, you must recognize that this will not tell you if the current extent has been exceeded. You will, therefore, have to test CR to see if it has exceeded 7FH; and if it has, you will have to handle the closing of the current extent, incrementing EX, and opening the new extent yourself. It is simplest just to repeat the read and let BDOS handle the rest.

The next function to look at is *write random*:

BDOS function no:	34
Function name:	Write random
Function purpose:	Write RCR from the file named in the FCB
Entry parameters:	[C] = 22H
	[DE] = FCB address
Exit parameters:	[A] = error code

This function is exactly like read random except that the data is being written to disk from the current DMA address. Once again, BDOS uses the value contained in RL and RM to calculate the EX and CR values for this record. BDOS handles all closing and opening of extents required and, in addition, takes care of allocating new blocks to the file as needed.

Like read random, BDOS sets the EX and CR fields in the FCB to new values each time this function is called, but no incrementing of these or the RL-RM values takes place. Therefore, all the important points discussed under read random apply here as well.

If the write is successful, a 0 is returned in register [A], while an unsuccessful write returns an error code. The possible error codes for random write are 03, 05, and 06. The 03 and 06 codes have the same meaning as they do in random read operations, while code 05 indicates that a new extent cannot be created because the disk directory is full.

The next function is *write random with zero fill*:

BDOS function no:	40
Function name:	Write random with zero fill
Function purpose:	Write RCR from the file named in the FCB and fill unallocated blocks with zeros
Entry parameters:	[C] = 28H
	[DE] = FCB address
Exit parameters:	[A] = error code

This function is identical to the standard write random function except in one aspect. In cases where a new disk block is being allocated for the file, the entire block is filled with 0s before the record is written. This has the effect of eliminating old data that may have been left in these disk sectors. While on the surface this may not seem important, anyone who has had to reconstruct a file or otherwise manipulate one without knowing exactly what valid data it contains will appreciate the idea of not having a collection of invalid leftover data mixed in with the good stuff.

The next function is *compute size*:

BDOS function no:	35
Function name:	Compute size of file
Function purpose:	Obtain highest record + 1 of the file
Entry parameters:	[C] = 23H
	[DE] = FCB address
Exit parameters:	RCR is set in FCB

This function is used to find the size of a previously opened file on disk. The FCB referenced in the [DE] register pair specifies the disk (0 or 1 through 16) and the file name to be tested. No wildcard characters may be used in the FCB and the random record fields (RL-RH) must be set to 0. BDOS locates all extents of the file and returns a value that is equal to the last valid record in the file plus 1. (Note that since record numbers start with 0, this is the actual record count for the file.)

The value returned by the compute size function is placed in the RL-RH fields. If field RH is nonzero after the completion of the function, this indicates that the highest possible record number (65,535) has already been written in this file. In such cases, the other two random record number fields are meaningless. If, on the other hand, the RH field is 0 at the completion of the function, then the fields RL and RM contain a valid sixteen-bit record number indicating the next available (unwritten) record of the file.

Although the function may be used on any file, it has its greatest value with files created sequentially—that is, files that have all records from beginning to end filled with data. With these files, the value returned is the correct size of the file in records. As we've seen, however, files that have been created randomly may have gaps throughout. Indeed, it is even possible to write a file on an Apple disk that contains record 65535, provided that only a few records are written. This function is unable to tell whether the file contains gaps or is complete; consequently, the value reported for files with gaps won't be accurate. Instead, the value returned will be the number of records the file would contain if it were completely full.

The compute size function is used for another purpose besides file-size calculation. Programmers often call it to find the end of a file in preparation for adding more material. Since the value returned by the function is the next available record, and since the RL-RH fields are set by BDOS, a random write operation can be performed immediately without altering the FCB at all.

Using function 35 to extend a file in this manner is relatively simple. The first record to be added to the end of the file is moved into the DMA memory area (or the DMA address is altered to point to the data), and a random write function is called. Without altering the data (or the DMA address), the write is then repeated in sequential mode to adjust CR and EX automatically. From that point, any number of additional sequential writes may be made to complete the extension of the file.

Obviously, using function 35 for this purpose is most useful with files created sequentially, since new records will usually be added at the end of the file. With random files, the programmer is nearly always following a numbering scheme of some kind that determines where additional records will be added; and these records usually won't be in sequence.

The final function to be examined is *set random record*:

BDOS function no:	36
Function name:	Set random record
Function purpose:	Compute RCR for given CR and EX
Entry parameters:	[C] = 24H
	[DE] = FCB address
Exit parameters:	RCR is set in FCB

This function's purpose is to obtain the random record number for a given sequential record number (CR) and extent (EX) of the file. The standard practice is to perform sequential reads or writes of the file until the desired position is reached and then to call this function. When the function is complete, the RL and RM fields of the FCB will be set to the correct random record number for this CR and EX. Since this function only converts successfully read sequential record and extent numbers, there will never be a case when an invalid random record number (RH nonzero) is returned.

According to Digital Research, the primary use of this function is with random files that are based on some type of key system. Such files contain easily recognizable key data at strategic points to separate one part of the file from another. To use the function with such files, one supposedly scans the entire file searching for the various keys. As each is found, function 36 is used to obtain the correct random record position corresponding to that key. Then when all keys have been identified, the program can go on to do all of its actual work on the file in random-access mode. This is certainly a valid way to use this function, but it is not the most efficient form of random access file usage.

This completes our discussion of the functions. Now it is time to move on and incorporate these new system calls into our subroutine library. Figure 2 shows the new subroutines by themselves. As you can see, we have again made use of the skipping effect of the LD HL,*nnnn* opcode to preserve the [C] register as we cascade down the chain from whichever entry point we select.

Since all the file functions but one (function 26) require that [DE] contain the address of an FCB, we have placed an instruction to load [DE] with the default FCB address (005CH) at the end of that group of functions. By placing function 26 after that point, we avoid destroying

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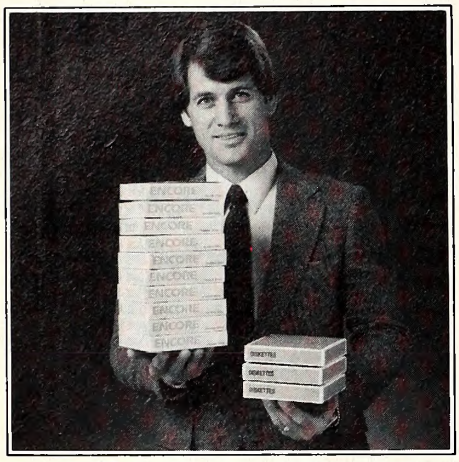

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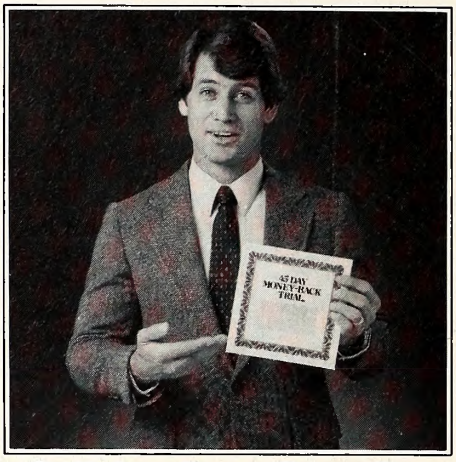

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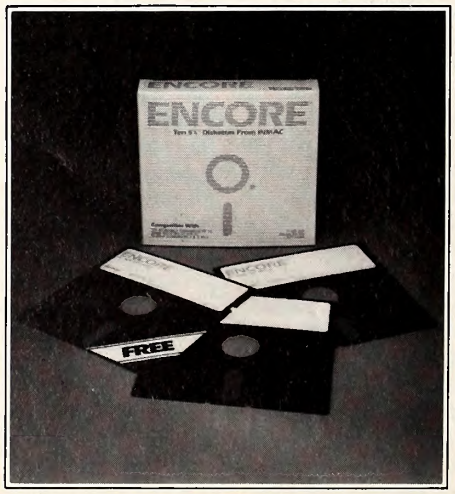

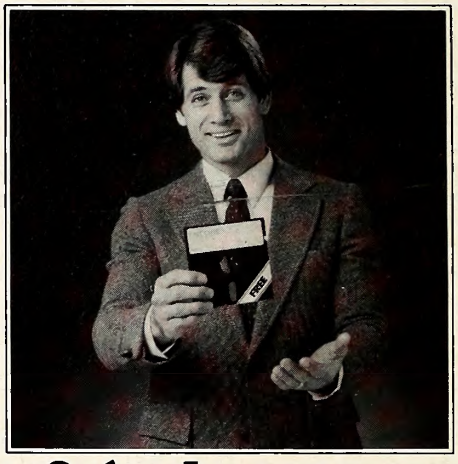

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```
SRCHFR:  LD      C,11H          ; Search for first
         DB      21H            ; Skip 2 bytes
SRCHNX:  LD      C,12H          ; Search for next
         DB      21H            ; Skip 2 bytes
MAKFIL:  LD      C,16H          ; Make file
         DB      21H            ; Skip 2 bytes
DELFIL:  LD      C,13H          ; Delete file
         DB      21H            ; Skip 2 bytes
RENFIL:  LD      C,17H          ; Rename file
         DB      21H            ; Skip 2 bytes
SETATT:  LD      C,1EH          ; Set file attributes
         DB      21H            ; Skip 2 bytes
OPNFIL:  LD      C,0FH          ; Open file
         DB      21H            ; Skip 2 bytes
CLSFIL:  LD      C,10H          ; Close file
         DB      21H            ; Skip 2 bytes
RDSEQ:   LD      C,14H          ; Read sequential
         DB      21H            ; Skip 2 bytes
WTSEQ:   LD      C,15H          ; Write sequential
         DB      21H            ; Skip 2 bytes
GTSIZE:  LD      C,23H          ; Compute file size
         DB      21H            ; Skip 2 bytes
SETREC:  LD      C,24H          ; Set random record
         DB      21H            ; Skip 2 bytes
RDRAN:   LD      C,21H          ; Read random
         DB      21H            ; Skip 2 bytes
WTRAN:   LD      C,22H          ; Write random
         DB      21H            ; Skip 2 bytes
WTFILL:  LD      C,28H          ; Write random with zero fill
         LD      DE,005CH       ; Point [DE] to FCB
         DB      21H            ; Skip 2 bytes
SETDMA:  LD      C,1AH          ; Set current DMA address
         JP      0005H          ; Go BDOS ret to caller
```

Figure 2. File-related function subroutines.

the new DMA address; we manage this by loading [DE] with the FCB if function 26 is called.

Because we are loading [DE] automatically with the FCB address, programs that use the library in this form will have to use the default FCB area for file access. To eliminate this restriction, you can remove the instruction that loads [DE] and simply make sure that your program always loads the correct FCB address before calling the necessary subroutine. Another method would be to duplicate the subroutine calls both before and after the instruction to load [DE], thereby giving yourself the option to use either the default FCB or one of your own.

Now that we've completed the subroutines for file-related functions, we can incorporate them into our overall subroutine library. The library is shown in total in figure 3, with all available BDOS functions installed.

```
; ***********************************
; * GENERAL-PURPOSE SUBROUTINES     *
; ***********************************
ABORT:   LD      DE,SYSDSK      ; Reinsert system disk message
         CALL    MSGOUQ         ; Inform him
         CALL    GETCHR         ; Get ack, any char will do
         JP      0000           ; Go warm boot
;
SYSDSK:  DB      'Place System Disk in Drive A: and '
         DB      'Hit RETURN. . . $'
;
; ***********************************
; *    TERMINAL SCREEN FUNCTIONS    *
; ***********************************
;
BOTTOM:  LD      HL,0017H       ; Bottom left of screen
CURPOS:  PUSH    HL             ; Save position
         LD      HL,3D1BH       ; [L]=1BH, [H]="="
         CALL    SENDEM         ; Print them
         POP     HL             ; Restore position
         LD      A,L            ; Line position
         ADD     A,20H          ; Add offset value
         LD      L,A            ; Back to [L]
         LD      A,H            ; Horizontal position
         ADD     A,20H          ; Add offset value
         LD      H,A            ; Back to [H]
         JR      SENDEM         ; Print them
CLRSCN:  LD      HL,2A1BH       ; [L]=1BH, [H]="*"
         JR      SENDEM         ; Print them
CLREOS:  LD      HL,591BH       ; [L]=1BH, [H]="Y"
         JR      SENDEM         ; Print it
CLRLIN:  LD      E,0DH          ; Carriage return
         CALL    PUTCHR         ; Go to start of line
CLREOL:  LD      HL,541BH       ; [L]=1BH, [H]="T"
         JR      SENDEM         ; Print them
NORMAL:  LD      HL,291BH       ; [L]=1BH, [H]=")"
         JR      SENDEM         ; Print them
INVERS:  LD      HL,281BH       ; [L]=1BH, [H]="("
         JR      SENDEM         ; Print them
HOMCUR:  LD      H,1EH          ; [H]=single char home
         DB      21H            ; Skip 2 bytes
CURSUP:  LD      H,0BH          ; [H]=single char up
         DB      21H            ; Skip 2 bytes
CURFWD:  LD      H,0CH          ; [H]=single char forward
         JR      SENDIT         ; Print only one
SENDEM:  LD      E,L            ; Get first character
         PUSH    HL             ; Save second character
         CALL    PUTCHR         ; Send first
         POP     HL             ; Restore second
SENDIT:  LD      E,H            ; Get second
         JP      PUTCHR         ; Send it
;
; ***********************************
; *    CHARACTER I/O SUBROUTINES    *
; ***********************************
;
GETSTR:  PUSH    DE             ; Save buffer address
         LD      (DE),A         ; Set maximum characters
         CALL    BUFFIN         ; Get input
         POP     DE             ; [DE] = buffer address
         INC     DE             ; [DE] -> chars received
         LD      A,(DE)         ; [A] = chars received
         INC     DE             ; [DE] -> first character
         OR      A              ; Set Z80 zero flag
         RET                    ; Return to caller
;
CRMSGQ:  CALL    CARLF          ; Print leading CRLF
MSGOUQ:  JR      STROUT         ; Print string
;
CRMSG:   CALL    CARLF          ; Print leading CRLF
MSGOUT:  CALL    STROUT         ; Print string
CARLF:   PUSH    DE             ; Save possible string address
         LD      DE,CRLF        ; [DE] -> return and line feed
         CALL    STROUT         ; Go print them
         POP     DE             ; Restore any string address
         RET                    ; Return to caller
;
CRLF:    DB      0DH,0AH,'$'    ; CR, LF, and termination
;
DIRIN:   LD      E,0FFH         ; Direct console input entry
         CALL    DIROUT         ; Get character from keyboard
         OR      A              ; Get one?
         JR      NZ,DOCHAR      ; Yep, go process it
         LD      A,(LOOP)       ; No, get loop flag
         OR      A              ; Keep looping?
         RET     Z              ; No, return now
         JR      DIRIN          ; Yes, go try again
LOOP:    DB      00             ; Z=one pass, NZ=loop
;
DOCHAR:  AND     7FH            ; Yes, strip any high bit
         CP      61H            ; Is it L/C?
         JR      C,CTRL?        ; No, skip conversion
         CP      7BH            ; Maybe, is less than 'z' + 1?
         JR      NC,CTRL?       ; No, skip conversion
         AND     5FH            ; Yes, convert to U/C
CTRL?:   PUSH    AF             ; Save it for caller
         CP      20H            ; Is it printable?
         JR      NC,ECHO        ; Yes, go echo it
         CP      03             ; No, is it control-C?
         JP      Z,ABORT        ; Yes, then abort
         PUSH    AF             ; Save it again and . . .
         LD      A,5EH          ; . . . replace it with '^'
         CALL    ECHO1          ; Print '^'
         POP     AF             ; Get orig char instead of '^'
         ADD     A,40H          ; Make it U/C ASCII and . . .
         JR      ECHO           ; . . . go print it
;
```

```
ECHO1:  PUSH  AF        ; Init stack with dummy value
ECHO:   LD    E,A       ; Into [E] for DIROUT
        CALL  DIROUT    ; Send character to screen
        POP   AF        ; Restore char or dummy value
        RET
;
;***********************************
;*        BDOS SYSTEM CALLS        *
;***********************************
;
;
;-----( CHARACTER I/O FUNCTIONS )-----
;
STATUS: LD    C,0BH     ; Console status function
        CALL  0005H     ; Call BDOS
        INC   A         ; 00 -> 01, 0FFH -> 00
        RET   NZ        ; NZ=no character, so return
GETCHR: LD    C,1       ; Console input function
        DB    21H       ; Skip 2 bytes
PUTCHR: LD    C,2       ; Console output function
        DB    21H       ; Skip 2 bytes
RDRIN:  LD    C,3       ; Reader input function
        DB    21H       ; Skip 2 bytes
PUNOUT: LD    C,4       ; Punch output function
        DB    21H       ; Skip 2 bytes
LSTOUT: LD    C,5       ; List output function
        DB    21H       ; Skip 2 bytes
DIROUT: LD    C,6       ; Direct I/O function
        DB    21H       ; Skip 2 bytes
STROUT: LD    C,9       ; String output function
        DB    21H       ; Skip 2 bytes
BUFFIN: LD    C,10      ; Read buffer function
        DB    21H       ; Skip 2 bytes
GETIOB: LD    C,7       ; Get IOBYTE function
        DB    21H       ; Skip 2 bytes
SETIOB: LD    C,8       ; Set IOBYTE function
        DB    21H       ; Skip 2 bytes
;
;-----( MISCELLANEOUS FUNCTIONS )-----
;
RESETS: LD    C,00H     ; Reset system function
        DB    21H       ; Skip 2 bytes
GTVERS: LD    C,0CH     ; Get version number function
        DB    21H       ; Skip 2 bytes
SETUSR: LD    C,20H     ; Get/set user function
        JP    0005H     ; Go BDOS ret to caller
;
;---( FILE-RELATED DISK I/O FUNCTIONS )---
;
SRCHFR: LD    C,11H     ; Search for first
        DB    21H       ; Skip 2 bytes
SRCHNX: LD    C,12H     ; Search for next
        DB    21H       ; Skip 2 bytes
MAKFIL: LD    C,16H     ; Make file
        DB    21H       ; Skip 2 bytes
DELFIL: LD    C,13H     ; Delete file
        DB    21H       ; Skip 2 bytes
RENFIL: LD    C,17H     ; Rename file
        DB    21H       ; Skip 2 bytes
SETATT: LD    C,1EH     ; Set file attributes
        DB    21H       ; Skip 2 bytes
OPNFIL: LD    C,0FH     ; Open file
        DB    21H       ; Skip 2 bytes
CLSFIL: LD    C,10H     ; Close file
        DB    21H       ; Skip 2 bytes
RDSEQ:  LD    C,14H     ; Read sequential
        DB    21H       ; Skip 2 bytes
WTSEQ:  LD    C,15H     ; Write sequential
        DB    21H       ; Skip 2 bytes
GTSIZE: LD    C,23H     ; Compute file size
        DB    21H       ; Skip 2 bytes
SETREC: LD    C,24H     ; Set random record
        DB    21H       ; Skip 2 bytes
RDRAN:  LD    C,21H     ; Read random
        DB    21H       ; Skip 2 bytes
WTRAN:  LD    C,22H     ; Write random
        DB    21H       ; Skip 2 bytes
WTFILL: LD    C,28H     ; Write random with zero fill
        LD    DE,005CH  ; Point [DE] to FCB
        DB    21H       ; Skip 2 bytes
SETDMA: LD    C,1AH     ; Set current DMA address
        DB    21H       ; Skip 2 bytes
;
;---(NON-FILE-RELATED DISK I/O FUNCTIONS)---
;
SELDSK: LD    C,0EH     ; Select disk function
        DB    21H       ; Skip 2 bytes
RESETD: LD    C,25H     ; Reset single disk function
        DB    21H       ; Skip 2 bytes
RESETA: LD    C,0DH     ; Reset all disks
        DB    21H       ; Skip 2 bytes
GETCUR: LD    C,19H     ; Get current disk function
        DB    21H       ; Skip 2 bytes
GETLOG: LD    C,18H     ; Get login vector function
        DB    21H       ; Skip 2 bytes
GETALO: LD    C,1BH     ; Get alloc vector function
        DB    21H       ; Skip 2 bytes
PROTEC: LD    C,1CH     ; Write protect disk function
        DB    21H       ; Skip 2 bytes
GETROV: LD    C,1DH     ; Get R/O vector function
        DB    21H       ; Skip 2 bytes
GETDPB: LD    C,1FH     ; Get DPB address function
        JP    0005H     ; Go BDOS, RET to caller
;
GETUSR: LD    E,0FFH    ; E is flag for BDOS
        JR    SETUSR    ; Go via SETUSR call
;
```

Figure 3. The complete subroutine library.

As you can see, since the file-related functions do smash the [DE] register pair, we have had to separate the character I/O and miscellaneous functions from the disk functions by placing a JP 0005H instruction at the end of the miscellaneous function calls. This costs two bytes, but it is probably the optimum way of accomplishing the task.

This completes our study of the BDOS functions themselves. Until next month....

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DOS's New Type Command

One of the biggest problems with Apple text files is that there's no easy way to see what's in them. This month we're going to solve that problem once and for all by adding to DOS a new command, called *type*, that will display any text file on your screen or printer (or send it through your modem, for that matter). In addition to gaining this very handy command, you'll learn some interesting details about what text files look like on the inside and what's involved in adding commands to DOS 3.3.

Text File Fundamentals. For the sake of those of you who are new around here, we'll start this discussion in very shallow water. We'll slowly wade in deeper—feel free to get out and dry off when you can't hold your breath any longer. Now don't be afraid.

Text files are almost always used to hold data rather than programs. When you catalog your disk, text files are the ones that have a *t* in front of them (DOS 3.3) or *txt* in the type column (ProDOS). Sample catalogs are shown in figure 1.

There are two kinds of text files, *sequential* and *random access*. Sequential files consist of one long stream of ASCII characters (letters, numbers, symbols, and control characters). DOS 3.3 sequential files end with a special marker, control-@ (hex $00). The stream has no other essential characteristics. If you want to read a file by using standard Applesoft input statements, there must be at least one return character in the file every 256 characters—but this is an Applesoft requirement; DOS doesn't care.

Random access files also consist of streams of characters, but the characters are arranged in a more orderly fashion. Random access files consist of a series of *records* all having the same length. The records in a random file can be as long as 32,767 characters (DOS 3.3) or 65,535 characters (ProDOS). But as a practical matter, random files usually have a record length of between ten and a couple of hundred characters.

You assign the record length you want a file to have when you *open* it. If you assign a file a record length of fifty, for example, the first fifty characters in the file belong to the first record, the next fifty to the second record, and so on. (Incidentally, the first record is always referred to as record *zero*, the second as record *one*, and so on.)

In each of the catalogs in figure 1, one of the files is sequential and one is random access. No matter how long you study the DOS 3.3 catalog, you'll never figure out which is which. The information isn't there. Nor is there anything about how long the records of the random access file are. You have to remember those details yourself (you say you bought a computer to remember things for you?).

```
]CATALOG                    (DOS 3.3)

DISK VOLUME 254

T 002 APRIL SHOWERS
T 017 MAY FLOWERS

]CATALOG /SPRING/TIME       (ProDOS)

/SPRING/TIME

NAME              TYPE  BLOCKS   MODIFIED          CREATED           ENDFILE  SUBTYPE

APRIL.SHOWERS     TXT        1   3-APR-84 11:10    3-APR-84 11:09        155  R=    0
MAY.FLOWERS       TXT        9   12-MAY-84  9:33   12-MAY-84  9:15      4096  R=  100

BLOCKS FREE: 260    BLOCKS USED: 20    TOTAL BLOCKS: 280
```

Figure 1. Catalogs holding text files.

With ProDOS, on the other hand, this information is kept in the directory with other details about a file. Look at the last column of the ProDOS catalog. The parameter *R* indicates record length. Text files that have a record length of *zero* are sequential files. Any other record length indicates a random file and the length of its records.

The next to the last column of the ProDOS catalog, the one headed *endfile*, tells you the length of the file in characters. ProDOS always saves a file's true length in the file directory. DOS 3.3, on the other hand, doesn't know a file's current length. The numbers in DOS catalogs indicate how many disk sectors have been allocated to a file but are often not related to the file's actual length. For example, when a file gets smaller, sectors are not automatically deallocated. Thus, a file that was once 100 sectors long, but is now only 22 sectors long, will still display a "file length" of 100 sectors.

So where do DOS 3.3's *end of data* messages come from? DOS 3.3 returns an end-of-data error whenever it encounters an end-of-data marker. As noted earlier, this marker is a zero byte—hex $00 or ASCII control-@

Biting Off the Zero Byte. Let's take a look at the end-of-data markers in a DOS 3.3 file. A very interesting little text file we can look at is called *Apple Proms*—you'll find it on old DOS 3.3 System Master disks and new DOS 3.3 Sample Programs disks. Make a copy of your Apple Proms disk, boot the copy, enter this program, save it, and run it (a mistake could damage your disk—use an expendable backup until you have tested the program):

```
 5 PRINT "INSTALLING TYPE COMMAND . . ."

10 C$ = "9D54:DE BC"
15 GOSUB 500 : REM change command jump table

20 C$ = "A902:54 59 50 C5 00"
25 GOSUB 500 : REM change command name table

30 C$ = "A940:74"
35 GOSUB 500 : REM change syntax table

40 C$ = "BCDF:20 C6 A5 A9 8D 20 ED FD 20 EF BC 90 F8 4C EA A2"
45 GOSUB 500 : REM install first part of patch

50 C$ = "BCEF:AD 00 C0 C9 9B F0 03 4C 8C A6 8D 10
   C0 A9 00 38 60"
55 GOSUB 500 : REM install last part of patch

60 C$ = "A631:EF BC"
65 GOSUB 500 : REM Exec Killer (optional—see Dec '83 DOStalk)
```

```
 70 END
500 C$=C$+"N D9C6G"
510 FOR I=1 TO LEN (C$) : POKE 511+I,
    ASC(MID$(C$,I,1))+128 : NEXT
520 POKE 72,0 : CALL -144
530 RETURN
```

After running the program, enter *type apple proms* on your keyboard. If you've entered the program correctly, the contents of Apple Proms will quickly scroll by on your screen. Press control-S to stop and restart the scrolling; press escape to exit the display completely. The display will look something like this (the @ signs will be in inverse type):

```
]TYPE APPLE PROMS
75
DEL 1000,1250
SAVE RANDOM
HOME
RUN
@@PARALLEL PRINT,256,8,500
@@@@@@@@@@@@@@@@COMMUNICATIONS,256,8,1250
@@@@@@@@@@@@@@@@(NOT AVAILABLE),256,8,0
@@@@@@@@@@@@@@@@(NOT AVAILABLE),256,8,0
@@@@@@@@@@@@@@@@DISK BOOT,256,8,432
@@@@@ . . . and so on
```

Apple Proms is a data file for the DOS 3.3 demonstration program called *Random*. *Random* is a simple inventory-control program described on page 77 of the *DOS Programmer's Manual*.

Since it's a data file for *Random*, it would be reasonable to assume that Apple Proms is a random access file. It is. Look at the part of the file that begins with the word "communications" and ends with the open parenthesis of the first "(not available)." This is the third *record* in the file (but remember that it's officially called record 2).

This record describes a single item in a hypothetical inventory. The item is a communications PROM (a PROM is a programmable ROM—an electronic chip). The "256" indicates its size, and the "1250" indicates the quantity on hand. You can confirm this by entering *run Random*. The "8" is apparently *Random*'s programmer's lucky number and nothing more; *Random* reads and writes that portion of the record but never uses it.

The record length of Apple Proms is forty. Count the characters, including the ending @ signs, in the communications record. Don't forget to count the invisible carriage return after "1250." Exactly forty characters, right?

Count the other records if you like. They're all forty characters long. You can confirm this by looking at line 70 of *Random*, where the file is opened with the L parameter set to 40.

You've no doubt noticed that record zero is completely different from the others. Record zero, in fact, holds a small *sequential* file. The file consists of a series of Basic commands meant to be executed with the *exec* command.

The original version of *Random* wouldn't run while on the write-protected System Master disk. This small exec file was a part of a command sequence used to modify the original program and save it on a non-write-protected disk. The modifications the exec file makes (deleting lines 75 and 1000 through 1250) remove the rest of the self-modifying command sequence from the program before saving it.

Nowadays *Random* comes on the non-write-protected Sample Programs disk, so the self-modifying command sequence isn't included in the program. Nonetheless, Apple Proms still contains this small, sequential, exec-able file within record zero.

If you try to load Apple Proms into a text-file-compatible word processor, or if you try to read it with sequential text file commands, it will appear that the file ends right after this section. When DOS encounters the first @ sign, it assumes it has reached the end of the file. It is extremely difficult to fish anything out of a file beyond that first @ sign unless you are dealing with a random access file of known record length, or unless you have the help of our new type command or a disk sector read/write utility.

The type command will always show you *everything* in all of the *sectors* allocated to a file. If you have a file that contains nothing but the word *help!* and a carriage return, type will display those six characters and the 250 @ signs that make up the rest of the sector (each sector holds exactly 256 characters; character positions that have never had anything else stored in them hold @ signs).

Sizing Up Text Files. If you look at a catalog display to find out the number of sectors allocated to a very short text file like Help!, it will show that the file has two sectors. Yet type displays only 256 characters—one sector's worth. What happened to the other sector?

At least one sector of every DOS 3.3 file is used to hold the file's track/sector list. T/S lists are small databases Uncle DOS creates for each file on a disk. A file's T/S list points to the disk sectors in which the file's data has been stored. The smallest legitimate DOS 3.3 file you will ever see has two sectors—a T/S list sector and a data sector.

Occasionally you will see files in your catalog that show a sector length of one. These are files that were *opened* but never *closed*. They are empty, useless files, and you might as well delete them. Do all you can to avoid creating them in the first place. When DOS opens a new file, it allocates an entire disk track in the disk free-space map for it. When the file is closed, DOS goes back and corrects the free-space map.

When an opened file is never closed—say you turn off your computer or reboot before closing or deleting the one sector file—the disk's free-space map doesn't get corrected. What's worse, it can't be corrected later either—not even if you delete the file. Thus a disk with several one-sector files on it will appear to DOS to have far fewer free sectors than it really has. The only way to recover this space, short of special disk recovery utilities, is to use *fid* to move any good files to some other disk and reinitialize.

A single T/S list can point to 122 data sectors. If a file has more data sectors than that, a second T/S list sector is allocated, and so on.

Open, Delete, Open, Write. Whenever you open a new text file, it contains, as far as the eye can see, a stream of @ signs. Just as astronomers can detect background radiation that echoes the big bang that created the universe, all those @ signs you find in your text files are remnants of the file's creation. *DOS never puts an end-of-data marker in a file*. Instead, files begin life as a stream of end-of-data markers—data replaces the markers until the data ends and the markers begin again.

This has an important ramification. It's hard to make an existing sequential file or random access record shorter than it was before. If we changed the contents of Help!, for example, to "ok!" and used the type command to display it, we would find "ok!", a return, "!", a return, and the same old 250 @ signs in the file. The second exclamation point and return would always mysteriously be tacked onto the end of our file.

There is no straightforward way to tell DOS to end the file after the first return. You might think you could do it by writing a control-@ (*print CHR$(0)*) to the file, but not even this works. Basic sends the control-@ to DOS just like all other characters—in the high-value ASCII format. DOS receives a 128 (hex $80) rather than a data-ending zero. Therefore, it has become common practice when working with sequential files to *delete* old files before saving new information in them. Here's the standard sequence of instructions used for doing this:

```
400 PRINT D$;"OPEN INDY 500"
410 PRINT D$;"DELETE INDY 500"
420 PRINT D$;"OPEN INDY 500"
430 PRINT D$;"WRITE INDY 500"
```

The lines make precious little sense until someone explains them to you. The idea is to delete a preexisting file called *Indy 500*. If the file didn't exist yet, however, line 410 would return a "file not found" error. Just to make sure there's a file around to delete, we open it first. This will create a file called *Indy 500* if there's not one already on the disk.

Interestingly, this technique has to be modified slightly to work with ProDOS. ProDOS won't allow you to delete an open file. When converting programs to ProDOS, you have to add a line like 405:

```
400 PRINT D$;"OPEN INDY 500"
405 PRINT D$;"CLOSE INDY 500"
410 PRINT D$;"DELETE INDY 500"
420 PRINT D$;"OPEN INDY 500"
430 PRINT D$;"WRITE INDY 500"
```

With This Zero I Thee End. The difficulty with deleting the file first is that this takes a few seconds. In addition, it takes longer to save data in a brand-new file than in a preexisting one (DOS doesn't have to search for free sectors when using a preexisting file). Luckily, there are ways to avoid this awkwardness.

If you still have the *Random* demo program around, run it and call upon its powers to change the name of the "communications" PROM (#2) to "com". Then exit the program and give the command *type apple proms*. Here's what you might expect to see, given what we've discussed so far, and what you actually will see:

Original file:
@@@@@@@@@@@@@@@@COMMUNICATIONS,256,8,1250
@@@@@@@@@@@@@@@@(NOT . . .

Expected contents after changing "communications" to "com":
@@@@@@@@@@@@@@@@COM,256,8,1250
256,8,1250
@@@@@@@@@@@@@@@@(NOT . . .

Actual contents after change:
@@@@@@@@@@@@@@@@COM,256,8,1250
@

,8,1250
@@@@@@@@@@@@@@@@(NOT . . .

When *Random* updates the record for the communications PROM, it writes the new name, "com", in the record, followed by ",256,8,1250" and a return. It would be reasonable to expect that the next few bytes of the file would contain whatever they held before the change was made. Instead, the record holds an @ sign and two invisible carriage returns (detectable by the new lines they create). Where did that @ sign come from?

The humble little *Random* demo program includes an undocumented DOS programming trick. Here are the lines of *Random* that write the updated record into the file. When these lines are executed, WR$=D$+"write"; FL$="apple proms"; R=2; N$="com"; BL=256; BW=8; and ST=1250.

```
290 PRINT WR$; FL$;",R"; R : PRINT N$;","; BL;","; BW;","; ST
294 CALL 768 : PRINT
300 PRINT D$
```

Line 290 writes the updated data into record 2. Since there is no return-suppressing semicolon at the end of the second print statement, print puts a return after "1250."

The next line begins with a *call* to a machine language routine at location 768 ($300). What's this? The call is followed by a print statement and, in line 300, by a simple *print D$*, which turns the *write* command off. Studying *random* further, we find a statement at line 74, during the program's initialization sequence, that calls a subroutine at line 9000. This subroutine looks like this:

```
9000 FOR I = 768 TO 775 : READ J : POKE I,J : NEXT
9010 RETURN
9100 DATA 169,0,32,237,253,76,142,253
```

The subroutine pokes a short machine language subroutine at location 768. This subroutine is:

```
0300-  A9  00      LDA  #$00   load A with zero
0302-  20  ED  FD  JSR  $FDED  print it
0305-  4C  8E  FD  JMP  $FD8E  print a carriage return
```

So . . . it is that *call 768* that manages to put an end-of-data marker in record 2! The call also puts the first carriage return after the @ sign into the file—the *print* statement in line 294 puts in the second one.

You can use this trick to put end-of-data markers in your own files. If you do, you no longer need to delete preexisting data files. The trick doesn't work with ProDOS, however. Remember, ProDOS doesn't use end-of-data markers.

All about Type. The type command is very useful for finding out what's actually in a text file. It's also handy for dumping files to printers or other devices. Simply enter *pr#1*, or whatever, before entering the type command. In this case, you probably don't want to send that final string of end-of-data markers to your printer—it may choke on all those control-@s. You can fix type very easily by poking a different value into memory location 48362. If you poke in 208, type stops at the first end-of-data marker. To reset it so that type stops at the end of the last sector, the normal setup, *poke 48362,144*.

If you'd like to make the type command a permanent part of DOS, simply initialize a new disk after installing the command. Whenever that disk is booted, you'll have a type command.

When using type to display random access files with lots of unused records, you may occasionally get a display that is clearly wrong. For example, imagine you create a random file with a record length of 256 (the size of one sector). Store "spring fever" in records 0 and 5. When you *type* this file you will see record 0's "spring fever", return, and 243 @ signs, but that's all. You won't see the 1,024 @ signs that should be in records 1 through 4 or any part of record 5.

This is because DOS doesn't allocate data sectors to random files until something is actually stored in them. Check out the sector length of this imaginary file. It's only three. When type goes to get Spring Fever's record 1, DOS looks in the T/S list and finds that no data sector has ever been allocated for that file position. DOS assumes that the end of the file has been reached, tells type about it, and type halts execution.

When working with DOS 3.3 random files, it's best to initialize all the file's records with some kind of data—just blank spaces will work fine. Then type will display the whole file every time. This trick isn't necessary with ProDOS.

A potential problem with type that you should be aware of is that it uses the DOS free space at 48351 ($BCDF). The type installation program given here doesn't check to see whether this free space is truly free or if some other patch has already been installed there. Should type overwrite another patch, the previous patch will be destroyed. Likewise, if you or one of your programs should install a second patch at this location, type itself will be destroyed and cease to function.

Another problem with type is that it deletes the DOS *verify* command. In order to add new commands to DOS 3.3, one of the old commands has to be deleted (this is not true with ProDOS, as we'll see next month). Verify was chosen partly because it is not a widely used command, but mostly because it is by far the easiest command to usurp.

Adding Commands to DOS 3.3. There are three tables deep within the genetic structure of Uncle DOS that you must make adjustments to if you'd like him to respond to your own special commands. These are the *command name table*, the *command syntax table*, and the *command jump table*.

Whenever you send a command to Uncle DOS, he studies it carefully to determine whether he can beep you with a syntax error rather than executing it. This process is called *parsing*. First DOS looks at your command and tries to match it with one of the words in his command name table. This table was examined at length in DOStalk in April and May 1982.

Here's a quick summary. The command name table lives inside DOS between bytes 43140 and 43272 ($A884-$A908). The initial letters of each command are in low-value ASCII; the last letter of each is in high-value ASCII. The final byte of the table holds a zero. As Uncle DOS zips through this table looking for a match with your command, he counts the number of high-value ASCII characters that pass by. If he gets to the zero—which indicates no match was found—he passes the command on to Dr. Basic.

If a match is found, on the other hand, all further actions DOS takes are based on that count of high-value ASCII characters he has been keeping. The count is used to create an *index* into the two other command-oriented tables.

If you decide to make changes to the command name table, it's easiest if you replace an existing command with another of the same length. If you use a command name with fewer letters, you have to slide all the other commands down to take up the unused space. If you make a command longer, you have to find some other command you can make shorter.

The nice thing about verify is that it is the last command in the table. Thus there's no big problem with replacing its six letters with the four letters of type and moving the table-ending zero down two.

Once Uncle DOS has found a command in the name table and calculated an index, he immediately uses the index and the *command syntax table* to determine what parameters are required and what parameters are optionally allowed with the command. The command syntax table is at bytes 43273 through 43328 ($A909-$A940). Each command has two bytes in the table. The first two bytes are associated with the first command in the name table (init); the second two bytes with the second command (load); and so on.

Each bit inside the two bytes has a specific meaning. They are shown in figure 2.

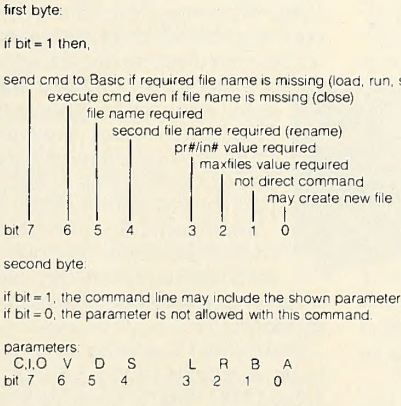

Figure 2. Command syntax table bits.

Exec, for example, has the hex values $20 and $74 stored in its two bytes. In $20, only bit 5 is set—a file name is required. In $74, bits 6, 5, 4, and 2 are set. This means the Volume, Drive, Slot, and Relative position parameters are allowed with this command. The type command, incidentally, allows the same parameters as exec.

There are more beautiful examples of assembly language programming than the DOS command parser (many of them within DOS itself). The section of DOS that uses the command syntax table is what's known as a hacker's delight. It is extremely complex and far from perfect. *Load 1 more file* or *load (control-P)Program* or *load program, a$800* should return syntax errors, for example. Instead, they will all hang up your system. They send control to Applesoft's *load cassette tape* routine, where it stays until you press control-reset (or until you load a cassette tape).

Feel free to change the syntax table to fit your needs—*with two exceptions*. Always make sure that the first command in the table (usually init) is allowed to create new files and that the second command isn't. Breaking this rule causes a strange bug that takes weeks to find.

Once all your command's parameters have been parsed with no errors, DOS uses the command index to select an address from the *command jump table* and jump to it. This table is at bytes 40222 to 40277 ($9D1E-$9D55). The addresses in this table are "pushed," which means they are one less than the true beginning of the routine they point to. Assembly language programmers may recognize the following section of instructions, which demonstrates how DOS passes control to the routines that actually execute the various commands:

```
LDX  CMDINDX          command number * 2
LDA  CMDJUMPS+1,X     get high byte of jump address - 1
PHA                     push it onto stack
LDA  CMDJUMPS,X       get low bye of address - 1
PHA                     push it onto stack
RTS                   jump to address via rts
                        (rts pulls address off stack, adds one,
                        and jumps to the resulting location)
```

Now comes the hard part of creating new DOS commands. Once your command has been successfully parsed, what is it going to do? Here's what the type command does:

```
                    1000 ************************************
                    1010 *
                    1020 *        DOS 3.3 "TYPE" COMMAND
                    1030 *
                    1040 *          DOSTALK—MAY 1984
                    1050 *
                    1060 ************************************
                    1080
                    1090          OR   $BCDF
                    1100
BCDF- 20 C6 A5      1110 TYPE     JSR  $A5C6    open & position file
BCE2- A9 8D         1120          LDA  #$8D     load A with a return
BCE4- 20 ED FD      1130 .1       JSR  $FDED    print it
BCE7- 20 EF BC      1140          JSR  NEXTCHR  load A with next character
BCEA- 90 F8         1150          BCC  .1       continue until no more sectors
BCEC- 4C EA A2      1160          JMP  $A2EA    close file
                    1170
BCEF- AD 00 C0      1180 NEXTCHR  LDA  $C000    peek at keyboard
BCF2- C9 9B         1190          CMP  #$9B     escape key pressed?
BCF4- F0 03         1200          BEQ  HALT       yes—stop execution
BCF6- 4C 8C A6      1210          JMP  $A68C      no—get next char from file
                    1220
BCF9- 8D 10 C0      1230 HALT     STA  $C010    clear keyboard strobe
BCFC- A9 00         1240          LDA  #0       pass back a zero
BCFE- 38            1250          SEC           and set the carry bit
BCFF- 60            1260          RTS
```

First let's look at the last half of the routine, *nextchr*. This routine is called every time a character is to be pulled from the file. It takes a peek at the keyboard to see if the escape key has been pressed. If so, execution passes to the *halt* sequence, which clears the keyboard strobe, loads the A register with zero and sets the carry (to simulate an encounter with a file-ending zero *and* with the end of the last sector in the file), and returns to the caller.

This same routine, installed in the same location, was used in the *exec killer* program presented in DOStalk in December. There it caused a press of the escape key to halt runaway exec files and the reading of text files. Here it has the same halting effect on type. You can easily activate the routine for exec and read too if you like—see lines 60 and 65 of the type installation program.

The top half of our patch begins with a subroutine jump to $A5C6. This is the section of DOS that opens exec files. It works beautifully here. The only problem with it is that if you try to stop type by pressing control-reset, DOS will stop typing and start execking. You're not supposed to press control-reset while DOS is working; but *never* press it while type is active.

Next we print a return and enter a tight loop that simply gets characters from the file and prints them. We continue through this loop until our call returns with the carry (a flag within the Apple's microprocessor) set. This indicates that either the end of the last sector in the file has been reached, or somebody pressed the escape key. At that point we jump to $A2EA, which is a routine that will close the file for us.

Earlier we discussed *poke 48362,208*, which stops all those @ signs from appearing at the end of *type*d files. What this poke actually does is change the *branch on carry clear* at $BCEA to a *branch on not equal*. Thus, whenever a control-@ (hex $00) is encountered in a file, the test will fail and we'll fall through to the instruction that closes the file. ■

Your Apple's telephone.

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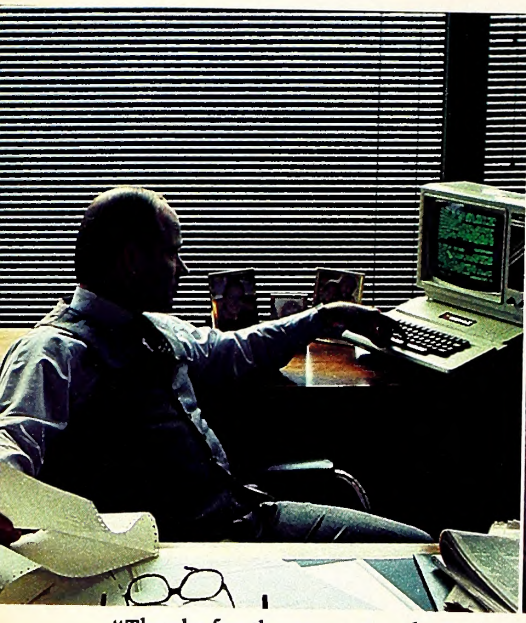
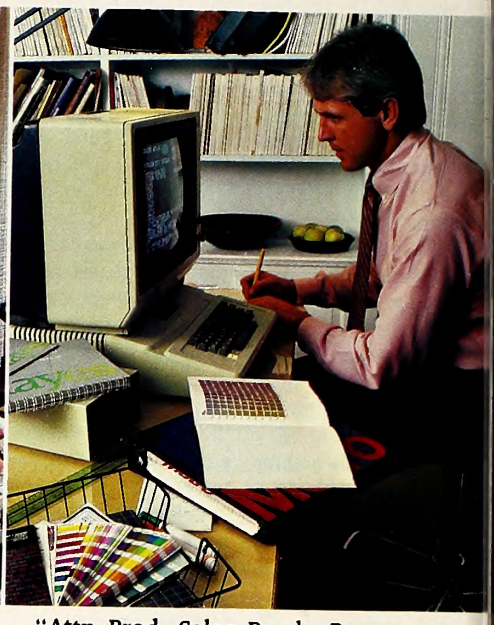


"Thanks for the prompt reply. Sure was a lot faster than waiting for the mail!"

"Gary: The pedigrees for next week's auction are as follows..."



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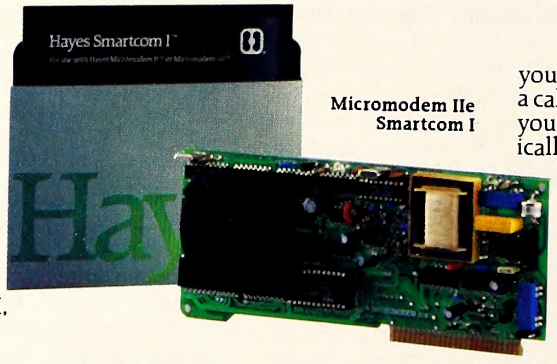

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Working on a Phone Line, Avoiding Downtown

Another working day is ended
Only the rush hour hell to face
Packed like lemmings into shiny metal boxes
Contestants in a suicidal race.
—Sting, "Synchronicity II."

Picture this: Each weekday between the hours of six and nine in the morning, millions of people hop into their cars, drive to a freeway, and merge themselves with a whole bunch of other cars, producing one of the ugliest sights in the civilized world—the traffic jam. The number of man-hours spent in traffic jams each day is mind-blowing. After they reach their respective destinations, these people go into different buildings, where most of them sit down at a desk.

Now picture this: The same millions of people, instead of going to their cars, walk across the room to a computer. When they get there, they sit down and begin doing the same work as the people who jumped into their cars. It's called telecommuting—doing one's work by home computer instead of having to go to an office.

The advantages to telecommuting are obvious: Traffic jams, fuel costs, and getting dressed for work would no longer be a problem. Given the opportunity, a lot of us would prefer to work at home and avoid the inconveniences of the daily commute.

Maybe telecommuting isn't quite the right term to describe the above scenario; the word sounds like it means people travel to work via telephone lines—a concept that's more amusing than it is viable. It's more accurate to define telecommuting as doing office work at home and sending in the finished product by phone. It's convenient, but just because you have a personal computer doesn't necessarily mean it's time to tell the boss you won't be coming into work anymore and are setting up your office in the countryside instead.

Who's It For? In order to be able to take advantage of telecommuting, a person's job must involve handling, creating, or retrieving information. That is, it must be work that can be done on a computer, such as word processing, number crunching, or information processing. It's possible that the work isn't being done on a computer yet; what's important is that it *could* be. Once the job is computerized, it shouldn't make much difference where the computer terminal is as long as you can connect a modem to it and send in completed work by phone.

A typical example of telecommuting involves the executive whose daily drudgery includes gathering data, analyzing it, making proposals, and distributing information in the form of reports. Of course, he or she will have to show up at the office for meetings, but it doesn't make too much sense to don a suit, hop in the car, and drive downtown to do other things easily done at home or at a cabin in the mountains.

From that description, telecommuting looks like the way of the future. It's a convenient and economical solution to one of the biggest hassles of the country's work force—commuting. However, whether it will catch on soon or catch on at all is questionable.

For telecommuting to be viable, managers will have to realize that it will improve productivity, and costs of transportation will have to remain high. There are problems with each of these conditions. First, managers can only understand that telecommuting will benefit business if someone has tried it; and second, no one wants to see gasoline prices rise.

So, despite the popularity of personal computers, telecommuting is still just an idea and not a common practice. However, there are people working on computers out of their homes. Professional writers, entrepreneurs, programmers, and consultants have been doing it for years. But that's not telecommuting, since most of them are self-employed and normally wouldn't be commuting to work.

It would be very procomputer to say that the benefits of telecommuting far outweigh the disadvantages; the trouble is that the benefits are economic and can be measured, while the disadvantages are social and are harder to measure. Let's look at the benefits first.

Life without Three-Piece Suits. Assuming that everyone who could telecommute did so, traffic jams and child care centers would be things of the past. We wouldn't have to worry about lousy weather making commuting a problem, nor would we worry about what to wear to work. Hours would likely be more flexible, allowing people to work at their convenience. Less office space would be necessary.

Well, it certainly seems like telecommuting would be the solution to a lot of problems, but it would also present some of its own. The biggest disadvantage is that social relations would be reduced significantly. Here are some things that are likely to disappear: company bowling night, coffee-break gossip, office politics (for better or worse), lunch with co-workers, and activities in general that could be totally unrelated to work but essential to job satisfaction. Heck, telling jokes at the coffee machine is the most fun some people have all day! From this angle, telecommuting is purely goal-oriented; its purpose is to increase productivity.

There is also the question of self-discipline. Face it, there are scores of other things we'd rather be doing than working. Outside of an office environment, it's sometimes difficult to concentrate on work. Granted, some people are pretty good at getting their work done under any circumstances. For the rest of us, the refrigerator, couch, backyard, and television can be terribly distracting. Even for those who have no trouble keeping their minds on work, keeping others away (especially the kids) from the computer can be a challenge.

With these problems in mind, it seems that the person who would be perfect for telecommuting is Bernice Bromfield, a self-motivated product development manager for AgriDentutek, a manufacturer of dental equipment for farm animals. Bromfield lives alone and has an Apple at home; Dentutek has a mainframe,

which Bromfield used to work with from a terminal at her desk. She convinced her boss that she could probably be more productive at home, and the boss, not being one to argue, agreed.

The first thing Bromfield had to do was figure out how to make her Apple talk to a mainframe. Unlike consumer-oriented systems like CompuServe, business mainframes don't expect computers, as opposed to mainframe dumb terminals, to be coming to them for information. As a result, different mainframes sometimes have different protocols that must be met before data can be transferred without errors. Bromfield isn't a technical whiz, so the best thing for her to do was to get someone familiar with the business's computer to help her get set up.

(A common misconception is that having a microcomputer at home automatically means you can use it like a terminal to work with any mainframe host computer. Using a microcomputer to function like a mainframe terminal so that the mainframe "thinks" the microcomputer is one of its terminals is called terminal emulation; the micro is emulating, or acting as, a mainframe terminal. Purists feel that sixteen-bit micros are better suited than eight-bit micros for terminal emulation because they can adapt more easily to various communications protocols. Unfortunately, the Apple is an eight-bit computer. In layman's terms, that means it will be harder to use an Apple for terminal emulation than it is to use a sixteen-bit machine for the job. Harder, but not impossible.)

New Office Tools. A few words about Bromfield's setup: An eighty-column card is almost always necessary, since most mainframes format displays in eighty columns, rather than in the Apple's forty. Trying to read eighty-column displays on a forty-column monitor is like listening to Paul Simon and Art Garfunkel one at a time and then trying to imagine what they would sound like together; you can get a general idea, but it's not the same as hearing it as it was originally intended. Solution? Invest in an eighty-column card.

Modems come in various sizes, prices, and speeds. For working with mainframes, speed is important. Currently, 300 baud is the most common speed for microcomputer modems, but the big computers are accustomed to communicating much faster than that. As the prices of 1200-baud modems drop to a level that's affordable to consumers, 1200 baud will likely become more popular. There are a lucky few out there who are using modems that work faster (2400-, 4800-, 9600-baud), but for purposes of transferring data files, 1200 is good enough.

With all the hardware set up, the next thing Bromfield had to take care of was software.

Remember, because the Apple is a computer (not just a terminal), it needs help communicating with a host. Additional peripheral boards are one solution, albeit an expensive one. Another way to make the Apple function like a mainframe terminal is through software. A popular program that does that is *Softerm 2*, from Softronics (this is *not* an endorsement; a review of *Softerm 2* appears in Marketalk Reviews this month).

Softerm 2 is oriented more toward transferring files than capturing data. Its main feature is that it provides exact terminal emulation for

twenty popular mainframes. Transfer methods include character protocol for text file transfers, the popular xmodem protocol for transferring binary files to or from CP/M systems, and Softronics's Softrans protocol, which transfers any type of file and provides binary encoding and decoding, cyclic redundancy check (CRC) error detection and automatic retransmission, and data compression.

As unique as *Softerm 2* sounds, it isn't the only program that provides terminal emulation—it's just currently the most comprehensive. The Professional series (*ASCII Express*, *Z-Term*, and *P-Term*, which used to be published by Southwestern Data Systems), from United Software Industries, offers terminal emulation in the form of prefix keys. Prefix keys are those that can be modified to produce characters not available on the Apple keyboard.

Life without Square Brackets. Especially true of the Apple II and II Plus, some keys, such as underscore, backslash, vertical line, and square and curly brackets, just aren't there. When using the Apple by itself, not having those keys isn't usually a problem; programs written for the Apple don't require them. But some corporate systems, like the one at Bromfield's office, use those special characters for important functions.

Customizing prefix keys is simple. Here's what it looks like in *ASCII Express*:

```
Prefixed Terminal Keys
   Prefixed Key          Output Character
      ,   ($2C)              [   ($5B)
      .   ($2E)              ]   ($5D)
     ^O ($0F)               ^_($1F)
      .                      .
      .                      .
      .                      .
     ^Q ($11)               ^Q ($11)
     A)dd        D)elete     e(X)it?
```

The characters in the "Prefixed Key" column are what you press on the Apple keyboard, and the characters in the "Output Character" column are sent to the host when prefix keys are pressed. Let's say we want to add a prefix key that will transmit the backslash character.

After selecting the "Add" option, *ASCII Express* will ask us which key we want as the prefix key (which key we want to press to generate the backslash character). Any key will do; let's choose control-U. Then it will ask us what output character we want (what character to send to the host when the prefix key is pressed). Since there isn't a backslash key on the II or II Plus keyboard, we can type in the ASCII value of the backslash character, which is $5C (in hexadecimal). Obviously, it helps to have a chart of ASCII characters and their respective values.

Now when we want to send a backslash to the host, we can just type a control-U, and the host sees it as a backslash character. Looking at the table of prefixed terminal keys, we notice a problem. What if we want to type a comma? The table shows that typing a comma will send a left square bracket. *ASCII Express* takes care of that by requiring a special character (control-W) to be typed just before prefix keys. Thus, special characters require two keys to be pressed; to send a left square bracket, you would type control-W and then a comma. Control-W tells *ASCII Express* that the next character (the comma) is a prefix key and to send the corresponding output character (left square bracket) instead of the comma.

Again, we can't say this enough times: *ASCII Express* is used as an example only.

As we can see, the technology for telecommuting is available, but the question of whether it's practical is still unanswered.

Big Boss Is Watching. Monitoring how well a telecommuter works isn't any trouble. If necessary, a person's boss need only check with the office computer to see how things are going. The only problem with that kind of monitoring is that it approaches a fine line between monitoring and invading privacy. Where does monitoring end and going through a person's "desk drawers" begin? It's hard to tell, which is why telecommuting will have to be based on a work supervisor's confidence in workers. The whole point of telecommuting is to let people work on their own without someone looking over their shoulder all the time.

From this point of view, telecommuters will be people whose bosses don't care how much time is spent working, as long as the job gets done. That might sound like "telecommuters will be people in whom the boss has a lot of confidence." But another way to translate it is "telecommuters will be people who the boss sees only in terms of their work, not as people," which implies that telecommuters will be noticed more when they're not working rather than when they do something exceptionally well. At promotion time, who will come to mind first, the person whose face you see in the office and with whom you talk each day, or the invisible soul whose work appears by modem?

Anyone in a position to promote workers won't likely have to make a decision under such circumstances. Chances are that two people in contention for a position would be working under similar conditions; both would be telecommuting, or both would be in the office. Even if one telecommuted while the other worked in the office, the one telecommuting would probably be in touch with the office occasionally at least.

Does Human Rights Cover This? It's difficult to imagine a society in which people worked almost exclusively from their homes. The image of millions of people sitting in front of computer terminals instead of at desks sounds more like the stuff of science fiction stories than the way of the 1980s or even the '90s. Telecommuting could mean the extinction of personal communication. We can't ignore that we're social animals who demand interaction. We are the species whose daily activities (in American society, at least) produced such terms as rush hour, take a meeting, let's have lunch, coffee break, happy hour, discuss it over dinner, let's party, and meet me at the Hilton.

In our discussion of teleconferencing by computer last month, we mentioned some of the negative aspects of not being in the presence of someone with whom you're communicating; eye contact, visual cues, body language, hand gestures, smiles, and even the rolling of eyeballs are lost. Most of us communicate more effectively when we can see who we're talking to and they can see us.

Also, an office environment includes much more than just walls, lights, and furniture. Occasional positive words from co-workers or supervisors can be especially conducive to work (anything from "I like how you handled the Clark account; keep up the good work" to "Gosh darn, those are nice shoes"). Except for shut-ins and hermits, we generally like being around people, and they sometimes like being around us.

Because we thrive on interaction, telecommuting will probably become a part of the working world, not a replacement for the business office. There's nothing too strange about making a living out of one's home; lots of entrepreneurs do it. Before centralized cities, working from the home was commonplace.

Telecommuting has something for everybody. If you want to work at home, the technology is here; if interacting with fellow workers is worth fighting traffic and paying for expensive gasoline, rest assured that the traditional office will be around for a while.

Computers are tools. Telecommuting is one way to use those tools, and so far we've managed not to let them control or use us. It would take an incredibly incompetent society to rely on computers to keep it running. As sophisticated as our technology is, we're nowhere near incompetence. Well, complete incompetence, anyway.

If you know of any good terminal emulator hardware for the Apple, please send the info to Softalk Terminal Illness, Box 7039, North Hollywood, CA 91605. ■

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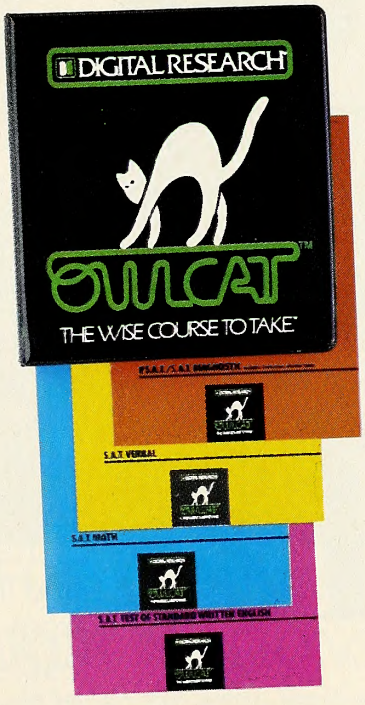

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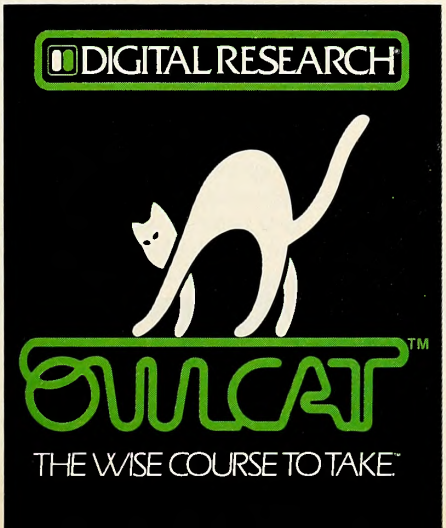

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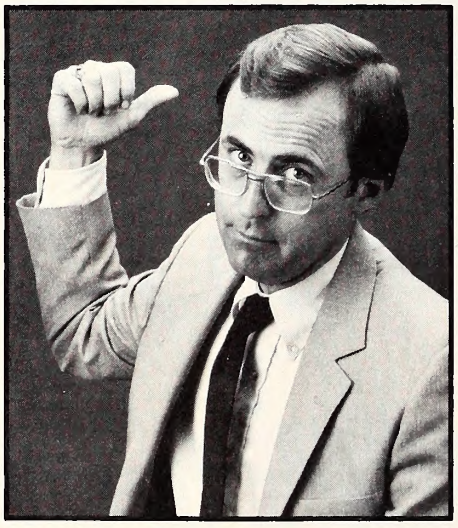

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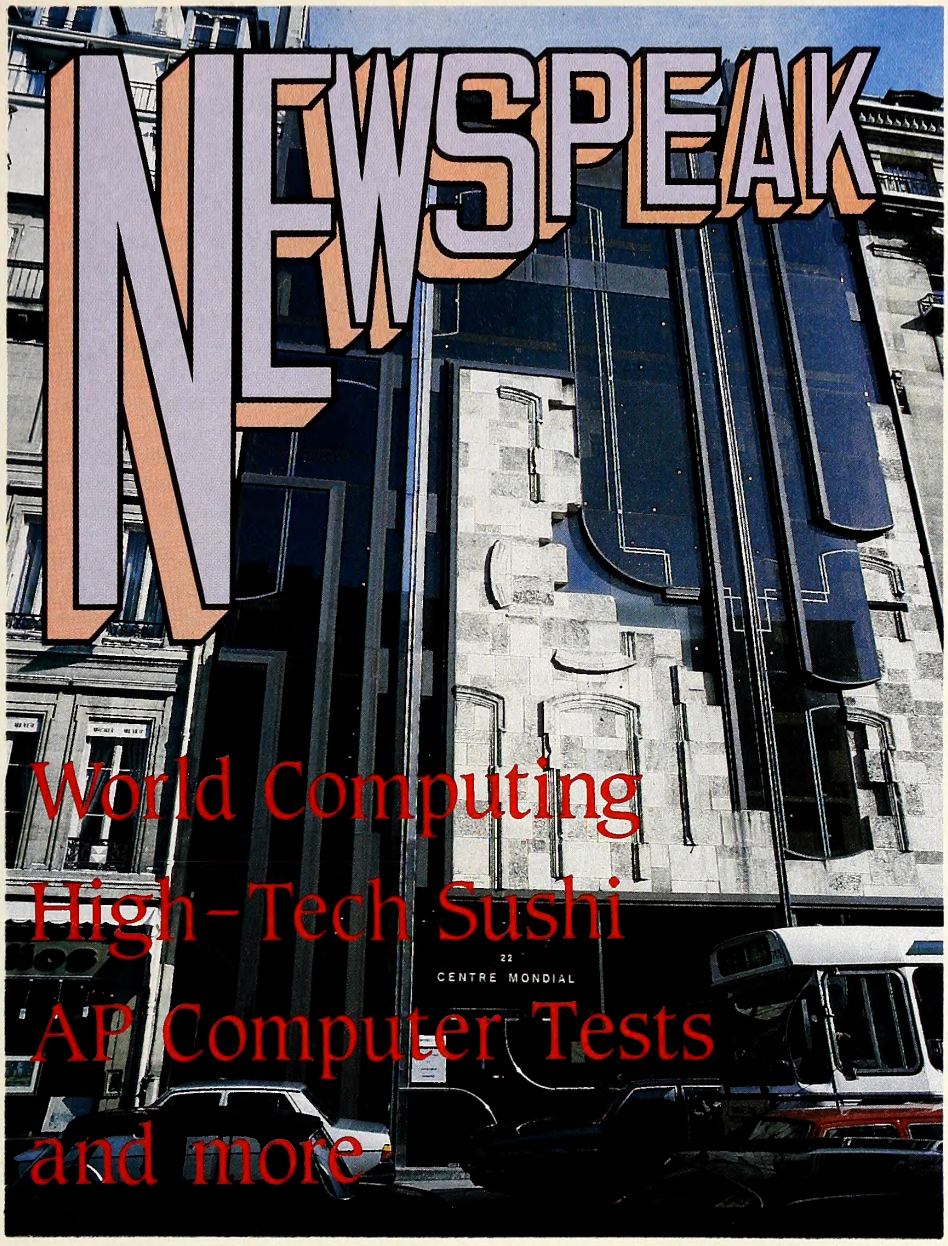

WORLD CENTER FOR COMPUTERS FOCUSES ON POORER NATIONS

Paris is a long way from the Third World—the countless small farming villages of India, the rugged mountains of Chad, the tropical rain forests of Africa. Likewise, computers seem far removed from the parts of the world where food, electricity, and roads are scarce, and where most people are illiterate, never drink pure water, and never see a physician.

So how is it that a group who expressly means to find and nurture the Bill Budges and Mitch Kapors of the Third World comes to hail from the City of Lights?

Paris is a hub of modern civilization, a living record of the forward march of culture, society, and technology. And Paris is fast becoming a major center for advancement of the computer arts and sciences. When these things are taken into account, the fact that an organization dedicated to sharing computer technology with poorer, less-developed nations has its headquarters in the land of Balzac, Berlioz, de Gaulle, Napoleon, and Renoir makes a bit more sense.

The Centre Mondial Informatique et Ressource Humaine (World Center for Computers and Human Resources) opened early in 1982. Surrounded by expensive art galleries on avenue Matignon near the Champs-Elysées, the Centre Mondial is as global in its attitude toward computing as its name would suggest.

The center was inspired by *The World Challenge*, a book by French politician and journalist Jean-Jacques Servan-Schreiber. Servan-Schreiber argues that computers will enable those who are intelligent and creative but uneducated to do more with their lives. The center's idealistic attitude stands out from

GOTO page 180, column 1

COSPAS-SARSAT RESCUE SYSTEM FLYING HIGH

Should you ever be in an airplane that's about to crash in a remote area, or on a ship that's rapidly sinking, the most vital piece of equipment you can possibly have—after a parachute or a life preserver—is a little metal box about the size and shape of an Apple II power supply.

The boxlike item is an emergency locator transmitter (ELT), which, upon impact or submersion in water, sends out a distress whoop over the aviation and maritime distress frequencies. It became required equipment in general aviation aircraft by an act of Congress in 1970. In 1972, the U.S. National Transportation Safety Board recommended that the Coast Guard and the FCC require the same of ocean-going vessels (in their case, the unit is known as an Emergency Position-Indicating Radio Beacon, or EPIRB).

The use of ELTs and EPIRBs was a good idea, with two rather large flaws: signal visibility and false alarms.

Lieutenant Colonel William Clark, director of the Air Force's inland search-and-rescue efforts, outlines the first problem: "The only way an ELT signal could be detected was if another airplane happened to be flying within radio range, happened to have the radio tuned to one of those frequencies, and heard the distress signal. The plane's pilot would then pass along his location to the FAA, and the FAA would pass it to us. We'd draw ever-decreasing circles until we could identify the search area and then launch our forces to go out and investigate.

"In the middle of the night in Kansas there's not a lot of air traffic; if you crashed you'd have to wait awhile."

In these early ELT days, both the National Aeronautics and Space Administration and the U.S. Coast Guard perceived that search-and-rescue operations could be enhanced by improved position location and expanded monitoring—that is, via the use of satellites. The Canadian Department of Communication had come to the same conclusion, and it agreed to work with NASA in coming up with a search-and-rescue satellite-aided tracking program

GOTO page 178, column 3

Computerized Sushi Bars to Appear in U.S. This Fall

Thanks to Japanese innovation, some sushi bars in Japan and others scheduled to open soon in the United States are computerized. The Sun Atom Company, under the direction of computer specialist and sushi fan Tsutomu Takeuchi, is marketing the Mi-Com system—a micro-based system that uncomplicates the ordering of sushi and takes the guesswork out of determining the bill. The first sushi bar with a Mi-Com system opened in Matsudo City near Tokyo last summer.

At traditional sushi operations, diners give their orders verbally to the *itamae*, the sushi chef, who then prepares the raw fish and steamed rice combinations as the customers watch. The chef presents the diners with a few pieces of the Japanese delicacy at a time, all the while keeping up a lively conversation. The *itamae* then gives the sushi eaters the bill, which customers sometimes find confusing since the menu is written on the wall sans prices.

The Mi-Com system eliminates much of the potential for frustration. Customers make their choices by touching a light pen to special displays built into the countertop. The displays show the kinds and prices of sushi available. Customers can also use Mi-Com to cancel their orders before they are filled by the *itamae*.

Orders are electronically relayed to the *itamae*'s command panel in succession, enabling him or her to make the sushi promptly. The computer eliminates the chance of the chef's forgetting an order. The *itamae* is now able to take care of as many as ten customers at once, rather than three or four, the previous average. Likewise, drink orders are transmitted to the waitress station.

The subtotal for the meal is flashed on the sushi eater's tabletop when the light pen is touched to the proper square. When the diners are ready to leave, they receive a combined or individualized computer printout, listing items, unit prices, and the total bill.

The Mi-Com also aids the restaurant's management by processing orders for sushi raw materials, controlling inventories, and issuing purchase orders. In sushi shop chains, each shop's microcomputer can be linked to a centralized accounting system.

The Sun Atom Company is setting up franchise sushi shops and hopes to have forty in Japan by next year. Three shops are currently in operation in and around Tokyo. New Meiji Franchise Corporation in the United States is remodeling some of its sushi takeout shops and constructing new ones to accommodate the computer system. Takeuchi, through New Meiji, hopes to have twenty shops in the U.S. equipped with the Mi-Com system by early next year, starting first with the West Coast and Hawaii, then moving on to New York, Chicago, and eventually throughout the United States and Canada.

Computerized sushi shops were originally scheduled to open on the West Coast in time for the Summer Olympics, but now their projected opening is in September or October, according to New Meiji.

The computer hardware, each unit costing the equivalent of $1,070 in Japan, enables the shop to serve three times as many diners as in a traditional sushi parlor. It is already evident in the sushi shops using the Mi-Com that the average sushi eater is ordering more food than before and that more customers are being drawn to the shops.

The Mi-Com system is not the first attempt to incorporate high technology in sushi shops, according to Sun Atom. Recently, other companies have introduced sushi-making robots and conveyor belt sushi delivery systems. But Sun Atom believes that the Mi-Com system is the most efficient method because it preserves the personal touch in sushi making, allowing the chef more time to converse with his or her customers. JG

AP Testing for Computer Science Begins This Month

High school Pascal programmers across the country will be able to strut their stuff the tenth of this month when Princeton, New Jersey-based Educational Testing Service (maker of the Scholastic Aptitude Test and most college entry exams) administers its first Advanced Placement examination in computer science.

Nationwide, some five thousand candidacies are expected on the Pascal test, said Harlan Hanson of New York City's College Board. The board decides what sorts of tests are needed and commissions ETS to design them. Pascal was selected because it has become the language of choice in higher education.

"Pascal gives students good programming practices—teaches them data structures—which Basic really can't," says computer teacher Pat Flenner of El Camino Real High School in Woodland Hills, California, a Los Angeles suburb.

Knowledge of structured languages is also desirable in the job market, she says. Perhaps ten of her more advanced Pascal students will take the exam. Students at El Camino also study Basic and have use of seventeen TRS-80 computers and fifteen IBM PCs.

The three-hour test consists of two equally weighted parts, one containing fifty multiple-choice questions and the other of some five to ten problems that require programs to be written to solve them. The tasks may be as relatively easy as the finding of the average of ten numbers or as complex as the designing of an electronic bulletin board. Areas to be covered will include arrays, strings, files, algorithms, linked lists, stacks, and queues.

"Students haven't been fazed by the practice tests we've given them," said Dennis Anderson, programming instructor at Ulysses S. Grant High School in neighboring Van Nuys. About fifteen of his students have signed up to take the test. The school has one Apple computer for every ten of the one hundred eighty computer science students; the lab and the Pascal course were both instituted last September. Though many in Anderson's preparatory course have studied Basic and other computer topics, some have not. All have taken second-year algebra, most have taken calculus, and many own home computers.

If you score sufficiently high on an AP test, most colleges and universities will waive an entry-level course, award class credit, or both. Though it appears that most schools will grant unit credit for the Pascal test (general credit toward the total number of units needed for graduation), it remains to be seen whether they will award subject credit (accept the test score in lieu of successful completion of an equivalent course at the school) in computer science, mathematics, or engineering. JP

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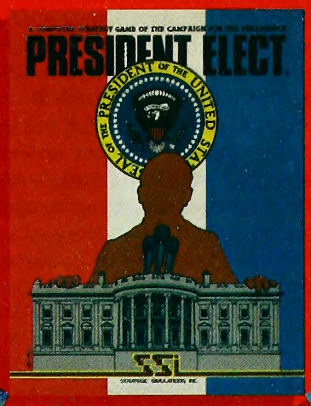

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The EEC Approves ESPRIT Computer Research Program

In an effort to keep Europe competitive with Japan and the United States in the high-tech arena of information technologies, the ten member countries of the European Economic Community (EEC) have given the go-ahead to an ambitious five-year, $1.25-billion research program dubbed ESPRIT.

The so-called European Strategic Program for Research and Development in Information Technology will be funded partly by the EEC Commission in Brussels and partly by twelve private computer and electronics companies.

The ESPRIT project will address five principal areas of research: advanced microelectronics, aimed at designing, manufacturing, and testing very high-speed large-scale integrated circuits; software technology, including what is described as "the management practices for information technology as well as the scientific knowledge underlying them"; advanced information processing, including the exploitation of VLSI; office automation and systems; and computer-integrated manufacturing.

Teams of university, government, and industry scientists will carry out the research, with the requirement that each project involve researchers from at least two EEC countries. In most cases, at least half of the funding for a project must come from non-Commission sources.

As recently as last December in Athens, the EEC members were still delaying approval of the ESPRIT program—the technical details of which had been decided upon in the middle of last year—because of the members' failure to reach agreement on various broader aspects of the EEC's finances. However, in early March, Etienne Davignon, head of both the energy and industry directorates at the Commission, was able to persuade both the West German government and British Prime Minister Margaret Thatcher to agree upon the project before further delay could undermine Europe's chances of remaining competitive in advanced information technology.

ESPRIT has been formed to address three major difficulties facing Europe's electronics industry as it tries to develop new technologies and remain competitive in international markets. The three difficulties center on the problem of raising long-term research and development funds during a period of economic recession and falling sales; a fragmented home market that is broken down into relatively small national units; and the reluctance of some within individual companies to subsidize those who have historically been economic and political rivals.

After the March meeting in Paris, where the project got its positive endorsement, Davignon called ESPRIT "the first optimistic decision of the years 1983 and 1984, which is going to impress both our American and Japanese partners." Laurent Fabius, French Minister of Industry and Research, also praised the project, claiming that the go-ahead decision also endorsed the broader strategy being promoted by France for increased cooperation between European countries in all fields of research.

A highly successful one-year pilot phase for ESPRIT, launched in the middle of last year with a budget of $20 million, attracted over two hundred research proposals, from which thirty-six were selected. EEC officials were impressed, not only with the number of proposals, but also with the apparent willingness of companies to let their scientists work together with few restrictions.

The twelve companies represented in the ESPRIT steering committee are Great Britain's GEC, ICL, and Piessey; West Germany's Nixdorf, Siemens, and AEG; France's CII-Honeywell Bull, Thomson-CSF, and CIT-Alcatel; Italy's Olivetti and SET; and Holland's Phillips.

Davignon has promised, in return for support from Great Britain and West Germany, that EEC resources for ESPRIT will be found by cutting back elsewhere in the EEC's planned research budget. These cuts could amount to $100 million out of a total of about $600 million next year, and even more in 1986. The single largest component in the Commission budget is funding for research into fusion energy, and no significant reduction in this area is expected. The most likely target is the program of the EEC's joint research center at Ispra in northern Italy, though the Italian government may strongly resist such a move. DH

Rescue System

continued from page 175

(SARSAT) in 1976. The French Centre National d'Etudes Spatiales joined SARSAT the following year, and the entry of the U.S.S.R. and its COSPAS satellite program in 1980 made the joint project COSPAS-SARSAT.

The first satellite in the project was launched by the Soviet Union on June 30, 1982. The COSPAS II went up the following March, along with the first U.S. SARSAT satellite, to be joined by a second before the end of the year. Ground stations and control centers are now operational in the U.S., Canada, France, the U.S.S.R., Norway, and the United Kindgom.

With the satellites in place, problem number one, signal visibility, was greatly eased. That left the problem of false alarms, which, if anything, with the new efficiency in picking up ELT signals, grew worse.

Lt. Col. Clark acknowledges the burden search-and-rescue operations must bear: "Our experience shows that 98 percent of the time, ELTs are going off not as the result of a distress situation. It's the combination of a bunch of things—just flat neglect on the pilot's part; or perhaps it's that some of the hardware is not as good as it should be. The FAA, FCC, NASA, the Coast Guard, the Air Force, and the Radio Technical Commission for Aeronautics, a group of interested people in the electronic and aircraft industry who meet to address problems like this, have all been debating the best solution."

Even when the problem of false alarms is not considered, the current system leaves a few things to be desired. To detect a distress

signal and pass on the information to ground- or air-based rescue forces, a satellite has to be passing over the transmitting ELT and be within the field of view of an earth station that can receive the information. The satellite does not store any information; instead it acts simply as a radio relay, or "bent pipe." The earth station ascertains the position of the signal and sends it to a central communicating system at the mission control center. The MCC takes that position, looks at a map of who has responsibility for search and rescue in that area, and sends that party the message that there's an ELT going off in their neighborhood.

But by and large, admits Clark, the system is a godsend. "SARSAT takes the long process of redefining the search area and gives us a relatively precise location—about twelve nautical miles from one satellite report. An airplane flying at thirty thousand feet would give us a search radius of three hundred miles.

"We don't want to oversell the thing; we're still very dependent on aircraft reports. While the satellite-generated report does an excellent job of telling where the signal is along the satellite ground track, it can't tell left and right because of the doppler shift method it employs. It's great for telling you where the thing is in terms of latitude, but it isn't worth a darn in longitude."

At the moment, it appears that help is finally on the way, in the form of the 406-mHz beacon. Using an exclusive, stronger, cleaner frequency than the original 121.5-mHz standard distress frequency model, this new transmitter will enable pilots and mariners in distress to not only send a signal but to include those personal touches that mean so much—manual entry of latitude and longitude and the nature of the emergency. There will be entry codes to indicate "Send pumps," "I'm on fire," or "Someone has appendicitis." The COSPAS-SARSAT satellite, even if not in range of an earth station, should be able to use its onboard recording capability and then dump all the information on its next pass over an earth station (or local user terminal, as they are known in satellite lingo). A new French-designed processor that makes this possible by measuring the doppler frequency on the spacecraft as well as on the ground eliminates the requirement for mutual visibility of spacecraft and LUT (launch umbilical tower) while a distress transmission is taking place. This processor represents an immediate and considerable saving of money on the number of earth stations needed for full global coverage.

The updated ELT has been submitted by the FAA for public comment; the device incorporates the specifications of the Radio Technical Commission for Aeronautics, including a monitor in the cockpit so that a pilot will know when his ELT is activated for any reason.

"Assuming that there is no argument with the proposal, then it will be adapted as a technical standard order," confirms Bernard Geier, manager of the general aviation and commercial division of the FAA. The higher-power, improved-frequency 406-mHz transmitter will then become commercially available for about $500. For the money, the pilot/mariner will get 95-percent probability of signal detection, with a signal accuracy range of within two kilometers and the ability to store up to four hundred distress signals. "At some future time we may require that all aircraft be fitted with the new units only," says Geier, "but that hasn't been determined yet."

"To be really effective," emphasizes Clark, "it has to be lightweight so that you can carry it on an airplane, and the user has to be able to afford it. We don't want another engineering-success-and-operational-failure type of thing."

The FAA's move toward making the superior 406-mHz unit the ELT of choice will have an immediate effect on the SARSAT program. Satellite programs have several stages, known as test, launch, demonstration, transition, and operations.

"The international demonstration phase will end this August," says Fred Flatow, SARSAT mission manager at the Goddard Space Flight Center in Maryland, "but we are planning to continue the demonstration phase with this new experimental 406-mHz system. The 121.5 will probably be discontinued."

Other things will change, too. The use of Hewlett-Packard 1000s at the SARSAT mission control center at Scott Air Force Base, Illinois, is, according to Flatow, one of them. "We are in the process of defining what the ultimate operational ground system should be like, and we are looking at many other computers. We already have two H-Ps lashed together and are buying a third one, but they are much too small to take care of the job."

Opposite page: October 11, 1982, the wreck of the *Gonzo*—the first marine rescue using the COSPAS-SARSAT system. The three crewmen were rescued after a passing COSPAS satellite picked up its ELT signal and relayed the exact location of the wreck to the Coast Guard. This page: an illustration showing how the COSPAS-SARSAT system operates. A correctly functioning ELT (emergency locator transmitter) is probably the most crucial part of the system.

For Flatow, "a truly operational system will have a specific configuration—so many satellites in orbit, a worldwide system of ground stations, and so on. The transition phase is one where we are going to build toward that—develop the real configuration of the ultimate system. I don't believe anyone can guarantee now how many satellites will be in orbit. The managerial shape of the ultimate system—whether it will be run by the U.S., run by the four partners now in the system, or be a worldwide organization à la the U.N.—has not been set. We're going to continue running the system the way we have it now, building more ground stations, getting more participants in, working out the shape of the ultimate system, and putting that in place. The transitional phase is one of building and firming up the organizational framework."

The "operational" phase of the program is scheduled to begin officially in 1990. While still "demonstrating," COSPAS-SARSAT has saved 180 lives as of this writing. AC

World Center

continued from page 175

the norm just as its modernistic headquarters stands out from the elegant seventeenth-century buildings that line avenue Matignon.

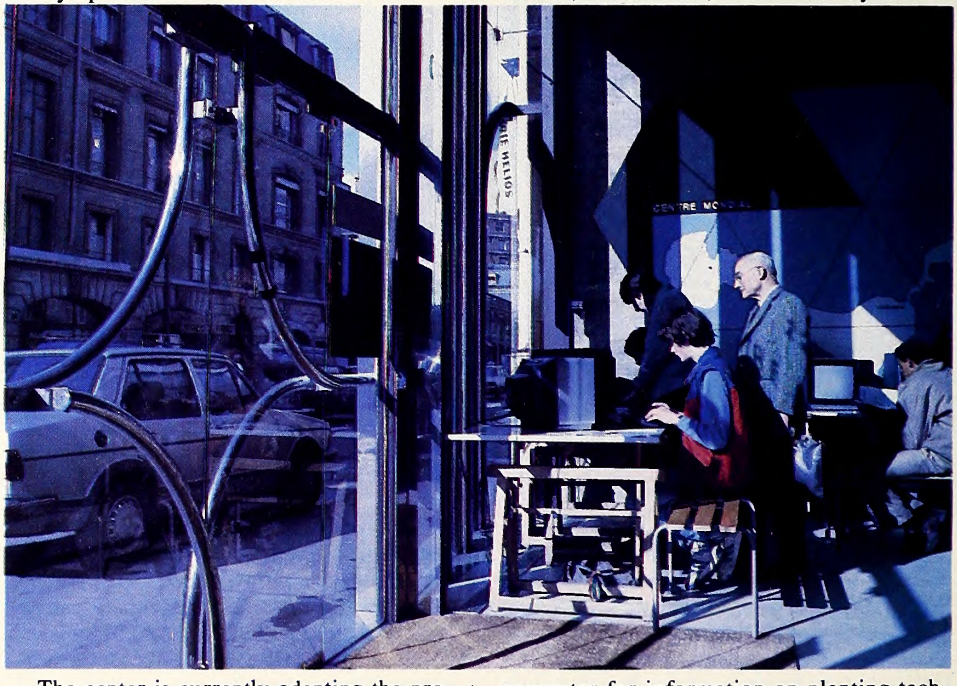
The center is concerned with the practical implementation of computers and the dissemination of information and knowledge about computers. An example of the latter is a cooperative research program begun in February 1983 with the country of Colombia called "Université à distance." The center has a similar program with Senegal.

The Centre Mondial's headquarters provides a glimpse of the organization's philosophies in action. Computers, say the center's organizers, should be accessible to everyone, even those who come in off the street. And indeed, as you walk through the center's glass front doors, you enter a large room filled with several brands of microcomputers, available to anyone who chooses to explore their functions and features.

Usually this room is filled with both young and old Parisians exploring Logo, language skills, and other microcomputer applications. It's a kind of high-tech playground for all ages; though, as you'd find at a playground of the more conventional kind, there are often more young people in evidence than older ones. A multilingual receptionist is available to answer questions. The rest of the building houses the administrative personnel of the center.

With the help of people like Raj Reddy, the center's scientific director, the Centre Mondial organizes and implements projects designed to bring the power of computing to the poorer, less-developed nations of the world. Reddy divides his time between overseeing the center's research activities and directing the robotics institute at Carnegie-Mellon University in Pittsburgh, Pennsylvania. The center has assembled about a hundred researchers, several in Paris and the rest scattered around the world, and put at their disposal several powerful computers.

One of the Centre Mondial's most ambitious projects is the development of a computer system to provide medical assistance in the small, extremely poor African nation of Chad. Center scientists have written a program that diagnoses and recommends treatment for leprosy, malnutrition, tuberculosis, meningitis, postabortion infections, and so on. Medical personnel with minimal training merely answer simple questions posed by the computer about a patient's medical history and symptoms.



The center is currently adapting the program to run on a battery-powered notebook-sized portable computer. A further enhancement of the system would be the use of Smart Cards—French-developed credit cards with microprocessors that store information. Each patient of a particular clinic would be issued a card containing his medical history stored on a chip. Then, when a patient returned to a clinic, only the most recent information would have to be entered.

The computer system in Chad—which should be implemented late this year—addresses the problem of native medical personnel leaving a poor country once they are trained. Once the system is installed, the computers will not be transient, and training new personnel to use them will be a simple matter.

The Centre Mondial has also donated a number of microcomputers to educational experiments in France and other countries. Last year, fifty computers were put at the disposal of youngsters in a tough neighborhood of Marseille. This effort has helped to reduce juvenile delinquency there. Another program begun late last year involves taking the five hundred brightest graduates of French technical schools and having them teach computer skills to the unemployed as part of the graduates' required year of military duty.

After a somewhat shaky start—the two principal scientists of the center, whose MIT credentials added credibility to the organization, quit as a result of disagreements over how the center should be run—the Centre Mondial seems to be accomplishing some of the goals that were set at its inception. But, according to Reddy, the true harvest is still to come.

Researchers at the Centre Mondial are convinced that as computer technology advances there will be even more effective ways to aid those who stand to benefit the most. They see voice synthesis and analysis as having particular promise in the Third World, where the majority of people are unlettered. A farmer, for instance, would verbally ask the computer for information on planting techniques and get the answer through a voice synthesizer. Since the problems of language and localizing hardware could be virtually eliminated, the sharing of technology would happen much faster.

Reddy himself grew up in a poor farming village near Madras in India. His rise to the position of an international authority on robots and computers is the kind of scenario that the center would like to see happen for others like him who may not otherwise get the opportunity to develop and use their abilities. The Centre Mondial Informatique et Ressource Humaine is an ambitious group, the results of whose efforts should be in evidence for many years to come. **DH**

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☐ **A Buck, a Franc, a Yen, a Pound.** The Department of Commerce is making economic reports available to U.S. businesspeople who are engaged in selling computers and peripherals overseas. The reports, which vary in length and price, describe market size, trends, and prospects for makers of mainframes, plotters, card readers, modems, and the like. Publication dates of the available reports range from 1977 to 1983. Newly gathered data to be published this year, however, will pinpoint export markets for minis and micros in fourteen countries and software and services prospects in five—France, Finland, Norway, the Netherlands, and the United Kingdom. The research is carried out by consultants, working under contract and aided by U.S. embassy personnel. The information is assembled from government statistics, specialized periodicals, and interviews with trade associations and computer firms based in the country in question. The reports cover about two-thirds of the approximately three dozen nations with which the United States encourages high-technology trade. Prices range from $10 for a twelve-page summary on a single country to $176 for an exhaustive document containing profiles of twenty-two nations. Midsize in-depth studies of a single country run $50 to $160. For a free catalog, contact the U.S. Department of Commerce's International Trade Administration or any ITA district office. JP

☐ **Big Brother's Books Are Watching You.** Since last month's Newspeak feature on Orwell and *Nineteen Eighty-four*, three more publications concerning the English author and his dystopian novel have come to our attention. *The Big Brother Book of Lists* published by Price/Stern/Sloan is a collection of 147 lists, ninety anecdotes, thirty-seven quotes, nine chronologies, three dozen glossaries, and a dozen Conrad and Mauldin cartoons on the theme of the invasion of privacy. *On Nineteen Eighty-four*, edited by Peter Stansky and published by W.H. Freeman and Company, includes twenty-two essays by Stanford professors comparing today's realities and Orwell's vision. *1984: Spring, A Choice of Futures*, written by Arthur C. Clarke and published in hardcover by Del Rey, is a collection of past speeches and essays that suggest a considerably less ominous view than Orwell's.

☐ **Follow the Yellow Brick Road.** The 1984 Kansas Computer Exhibition, to be held June 8–10 in Wichita, will include a Robotics Conference. The conference will feature speakers, demonstrations, and exhibits with an emphasis on personal, aerospace, and agricultural applications of robotics. In addition to the conference, the exhibition—which is the largest annual computer event in Kansas—will feature seminars, hardware and software demonstrations, and vendor exhibitions of computer-related products and services from in and around Kansas. For more information, contact the exhibition's sponsor, the Wichita Group, in Wichita, Kansas.

☐ **Winston Smith Meets Caligula.** As reported in last month's Newspeak, production has started in England on a new film version of *Nineteen Eighty-four*. What we didn't report is that John Hurt (*Alien*, *The Elephant Man*, *I, Claudius*) has been signed to play the role of Winston Smith, the story's protagonist.

☐ **Maple Leaf Mechanicals.** The Third Canadian CAD/CAM and Robotics Exposition and Conference will be held June 19–21 in Toronto, Canada. Conference topics include justifying robots to management, robotics education, robot socioeconomic considerations, and robotic engineering and applications. For more information, contact Hugh F. Macgregor and Associates in Toronto. ◨

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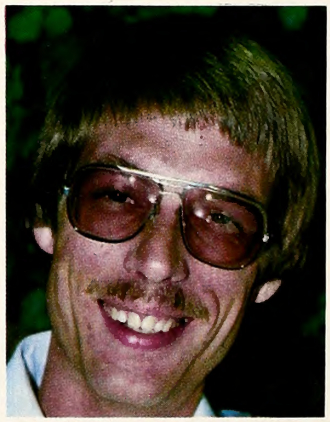

Roger Wagner on his recent tour of New Guinea

Assembly Lines: The Book
272 pages

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$19.95

Softalk Books
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Fastalk is a quick guide to popular, specialized, new, and classic software. When you need a particular kind of program or just want to see what's new, Fastalk is the place to look for fast answers.

If a program has been reviewed in *Softalk*, it carries the issue date of the review in italics at the end of its listing, and the capsule description given reflects the published review.

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Softalk may arbitrarily omit any package from Fastalk, whether or not it meets the foregoing criteria.

Adventure

Adventuresome story games in which players must deduce commands, make maps, and solve logical puzzles.

• **Adventure.** Crowther, Woods. The original text adventure, created on mainframe, contributed to by many over a long time. Very logical within fantasy framework, excellent puzzles, maps; complex, convoluted, and great. Several publishers: Microsoft, 10700 Northup Wy., Bellevue, WA 98004. $28.95. Apple, 20525 Mariani Ave., Cupertino, CA 95014. $35. Frontier Computing, Box 402, 666 N. Main St., Logan, UT 84321. $10.

The Coveted Mirror. Berns, Thomason. Nicely drawn characters, arcade subgames, and fun, logical puzzles enliven nonviolent medieval adventure. Humorous and animated. Penguin, Box 311, Geneva, IL 60134. $34.95. *11/83.*

✓ **Crypt of Medea.** Britto, Lamb. A real horror adventure: blood and body parts are everywhere, death loiters in every shadow. Thin plot. Not for the squeamish; not to be played just before, or just after, meals. Sir-tech, 6 Main St., Ogdensburg, NY 13669. $34.95. *4/84.*

• **Cyborg.** Berlyn. Text adventure with brief action skill game hidden in plot. As a futuristic part man, part robot, you're lost in a strange forest, desperately needing food and power. At its release, in its realism and use of true plot, *Cyborg* represented one of the most significant advances in adventuring since the original *Adventure*. Sentient, Box 4929, Aspen, CO 81612. $32.95. *11/81.*

Deadline. Blank, Lebling. Episode one in a series of murder mysteries by the authors of the Zork trilogy. Includes inspector's casebook, lab report. Text. Infocom, 55 Wheeler St., Cambridge, MA 02138. $49.95. *8/82.*

Death in the Caribbean. Hess, Hess. Challenging quest for pirate treasure features a mischievous ghost, huge maze, lush graphics. Well worth it. Micro Lab, 2699 Skokie Valley Rd., Highland Park, IL 60035. $35. *9/83.*

Enchanter. Blank, Lebling. First of trilogy sequel to Zorks expands interaction with other characters, goes above ground, increases use of logical magic. No big breakthroughs, but simply delightful. Infocom, 55 Wheeler St., Cambridge, MA 02138. $49.95. *9/83.*

• **Hi-Res Adventure #1: Mystery House.** Williams. Whodunit in a Victorian mansion. First adventure with pictures. Two-word parser with logical comprehension. Sierra On-Line, Sierra On-Line Building, Coarsegold, CA 93614. $24.95.

• **Hi-Res Adventure #2: The Wizard and the Princess.** Williams, Williams. The king has offered half his kingdom to the one who will bring back the kidnapped princess. Cross mountains, deserts; battle the wizard to claim your reward. Sierra On-Line, Sierra On-Line Building, Coarsegold, CA 93614. $32.95. *11/80.*

Infidel. Berlyn. Excellent puzzles and a surprising bad-guy hero in well-written treasure hunt. Infocom, 55 Wheeler St., Cambridge, MA 02138. $49.95. *11/83.*

Kabul Spy. Wilson. Cold War espionage adventure in which you must slip into Afghanistan to rescue a physicist before the commies make him talk. Sirius, 10364 Rockingham Dr., Sacramento, CA 95827. $34.95.

Planetfall. Meretzky. A lovable robot steals the show in this science-fiction text adventure. Includes many outstanding puzzles, rich, colorful, intelligent text. Infocom, 55 Wheeler St., Cambridge, MA 02138. $49.95. *8/83.*

• **Prisoner 2.** Mullich, EduWare. Totally relandscaped but loyal version of original game: full-color hi-res graphics added, puzzles reworded, obstacles expanded. Sophisticated and difficult exercise in intimidation with elements of satire. Escape from an island requires player to solve logical puzzles, overcome obstacles, and answer riddles. Excellent computer fare; nothing else like it. Peachtree Software, 3445 Peachtree Rd. N.E., #830, Atlanta, GA 30326. $32.95. *The Prisoner, 3/81*; *Prisoner 2, 10/82.*

The Quest. Snell, Toler, Rea. As the king's newest advisor, you must accompany a champion on a dragon-slaying mission. Champion, parser accept advice in full and multiple sentences. Penguin, Box 311, Geneva, IL 60134. $34.95. *9/83.*

• **S.A.G.A. Series.** Adams. Scott Adams's prototypical adventures—12 in all—spruced up with 100-color graphics and Votrax vocals. Fun, not always logical, very story-oriented series. Each adventure has its own theme and often exotic locale. They map small but score big on imagination. Adventure International, Box 3435, Longwood, FL 32750. $29.95 each. *7/82.*

✓ **Sorcerer.** Meretzky. Sequel to *Enchanter*. Navigate a 3-D maze, part the Red Sea, wax floors, avoid traps, and cast spells to rescue the guild master from a demon. Delightful. Infocom, 55 Wheeler St., Cambridge, MA 02138. $49.95.

Starcross. Science-fiction prose adventure that comes wrapped in a flying saucer. Set in the year 2186, main puzzle is to discover *raison d'etre* of miniworld asteroid. Likable, engaging. Superior puzzles. Infocom, 55 Wheeler St., Cambridge, MA 02138. $39.95. *11/82.*

Suspended. Berlyn. Well-plotted adventure demands control of six independent robots who can act simultaneously. Intelligent, challenging exercise in logic. A milestone. Infocom, 55 Wheeler St., Cambridge, MA 02138. $49.95. *4/83.*

• **Swordthrust Series.** Set of adventures, seven so far, that integrate fantasy role playing. Create one character, make friends in each new adventure, battle monsters and achieve goals together. Good stories, fun to map. Vocabulary no mystery, but puzzles are. Single character goes through all. CE Software, 801 73rd St., Des Moines, IA 50312. Number 1 prerequisite for rest. Each adventure, $29.95. *8/82.*

Transylvania. Antiochia. Some of best graphics ever in a hi-res adventure. Excellent puzzles and logic—no unfair tricks. Enjoyable. Penguin, Box 311, Geneva, IL 60134. $34.95. *10/82.*

Witness. Galley. Interactive mystery adventure set in 1938 reflects the style of pulp detective fiction popular then. Fun packaging and fun to play, although less complex than *Deadline*. A good step forward for an infant genre. Infocom, 55 Wheeler St., Cambridge, MA 02138. $49.95. *7/83.*

• **Zork I, II, III.** Blank, Lebling. Text lives! Three masterpieces of logic and grand adventure to revel in. Hard, logical puzzles with erudite parser that understands complete compound sentences and questions, has amazing vocabulary. *I* and *II* use standard scoring, standard goals; *III* has unique point system, and benevolence pays. Infocom, 55 Wheeler St., Cambridge, MA 02138. $39.95. *Zork I, 6/81*; *Zork II, 3/82*; *Zork III, 9/82.*

Business

✓ **AppleWorks.** Lissner. Word processor, database, and spreadsheet—each full-size, full-featured. Holds several files on "desktop." Proportionally spaced type. A winner. For IIe, IIc. Apple, 20525 Mariani Ave., Cupertino, CA 95014. $250. *4/84.*

BPI General Accounting. Performs like *General Ledger*. Prints checks, permits greater flexibility in handling accounts, produces 40 reports. 80 columns. Apple, 20525 Mariani Ave., Cupertino, CA 95014. $395.

BPI System. Popular six-module business package; programs also available separately. Includes *General Ledger* (a bestseller), accounts receivable, accounts payable, payroll, inventory control, and job costing. Apple, 20525 Mariani Ave., Cupertino, CA 95014. $395 each; job costing, $595.

dBase II. Speedy relational database management system. Requires SoftCard. Ashton-Tate, 9929 W. Jefferson Blvd., Culver City, CA 90230. $700.

✓ **Expense Account Manager.** Tracks yearly expenses—such as business trips, including mileage, lodging, places visited, purpose of trip, business-related entertainment—for tax and other record-keeping purposes. Easily customized. Adaptive, 1868 Cavell Ave., Highland Park, IL 60035. $150.

Magicalc. Graves. Electronic spreadsheet with automatic page formatting and support of additional memory boards up to 512K. Compatible with *VisiCalc* and *Magic Window II*. Artsci, 5547 Satsuma Ave., North Hollywood, CA 91601. $149.95. *11/83.*

Multiplan. Easy-to-learn electronic worksheet using plain-English commands. Powerful modeling and presentation capabilities. For use in analysis, forecasting, technical engineering, and the home. Versions 1.04 and up use 80 columns and extended memory on the IIe. Microsoft, 10700 Northup Wy., Bellevue, WA 98004. $275.

PFS:File. Page, Roberts. User controls data in totally unstructured database. Up to 32 pages (screens) of information in each record. IIe version has 80 columns, u/lc. Software Publishing, 1901 Landings Dr., Mountain View, CA 94043. $125. *10/80.*

PFS:Graph. Chin, Hill. Works alone or interfaces

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Masquerade	34.95	AP
Planetfall	49.95	AP, AT, COM, PC
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with files created with *PFS:File* and *VisiCalc*. Produces bar, line, and pie charts merging data from several sources. 80 columns and increased graphics support in IIe version. Software Publishing, 1901 Landings Dr., Mountain View, CA 94043. $125. *5/82.*

PFS:Report. Page. Powerful report generator designed for use with *PFS:File*. Sorts, calculates, totals, formats, and prints presentation-quality columnar reports. Software Publishing, 1901 Landings Dr., Mountain View, CA 94043. $125. *6/81.*

Quick File IIe. Easy-to-use personal database filing system that generates reports, sorts. Fifteen fields; files as long as disk allows. IIe, two disk drives. Apple, 20525 Mariani Ave., Cupertino, CA 95014. $100.

State of the Art System. Standalone or interfaceable modules for a 12-month accounting period. Includes *General Ledger*, *Accounts Receivable*, *Accounts Payable*, *Payroll*, *Inventory Control* ($495 each), *Budget and Financial Reporting*, *Sales Invoicing* ($395 each), and *Professional Time and Billing* ($795). State of the Art, 3183A Airway Ave., Costa Mesa, CA 92626. *Accounts Receivable, 10/83.*

✓ **TK!Solver.** Bricklin, Frankston. Modeling program from the creators of *VisiCalc*. Trades variables off against one another to find optimum balance of variables. Converts answers to specified units, generates tables and graphs quickly. Difficult. Requires IIe, extended eighty-column card. Software Arts, 27 Mica Ln., Wellesley, MA 02181. $399. *4/84.*

• **VisiCalc.** Bricklin, Frankston, Software Arts. Electronic worksheet for any problem involving numbers, rows, and columns. No programming necessary. VisiCorp, 2895 Zanker Rd., San Jose, CA 95134. $250. *10/80.*

VisiCalc Advanced IIe. Virtually the same as advanced version for the Apple III. Create spreadsheet templates, provide uniform approach to forecasting, budgeting, and planning tasks for an entire organization. VisiCorp, 2895 Zanker Rd., San Jose, CA 95134. $400.

VisiTrend/VisiPlot. Kapor. Combines *VisiPlot* graphics with time-series manipulation, trend forecasting, and descriptive statistics. VisiCorp, 2895 Zanker Rd., San Jose, CA 95134. $259.95. *7/81.*

Communications

ASCII Express: The Professional. Robbins, Blue. Greatly improved version of original modem software package features automatic redial, individual macro files, and conversion of Integer, Applesoft, or binary programs into text files. Works with a plethora of hardware. United Software Industries, 1880 Century Pk. E., Los Angeles, CA 90067. $129.95. *12/82.*

Data Capture 4.0. Copyable, modifiable smart-terminal program; compatible with Apple III and most lower-case adapters. Southeastern Software, 6414 Derbyshire Dr., New Orleans, LA 70126. $65. *7/81.*

P-Term: The Professional. Supports all Pascal-compatible interfaces, asynchronous serial cards, Apple-compatible modems, and baud rates up to 2400. United Software Industries, 1880 Century Pk. E., Los Angeles, CA 90067. $129.95.

Smartcom I. For the Micromodem IIe. Directs modem to place and answer calls, send and receive files with three protocols. Sends data to printer, stores three phone numbers, works with DOS 3.3, Pascal, and CP/M. Hayes, 5923 Peachtree Industrial Blvd., Norcross, GA 30092. $119. With Micromodem IIe, $329.

Transend 1, 2, 3. Intelligent-terminal software with multiple hardware compatibility. Advanced, easy to use. *1* sends text only; menu-driven, limited editor. *2* sends DOS files error-free, several files at once. *3* does both and handles electronic mail with automatic redial, clock calendar, and password protection. Upgrade: difference in price between two packages plus $20 service fee. Transend, 2190 Paragon Dr., San Jose, CA 95131. *1*, $89; *2*, $149; *3*, $275. *9/82.*

Fantasy

Role-playing games involving characters that develop through experience in adventuresome stories, and whose actions players determine via set commands.

• **Beneath Apple Manor.** Worth. The original dungeon game for the Apple, created in 1978. Newly released version has hi-res, sound effects, a few more magic items, but still the classic game. Quality, 21601 Marilla St., Chatsworth, CA 91311. $29.95. *2/83.*

Exodus: Ultima III. British. Super third installment of Ultima saga. Contains many features not found in *Ultima II*. Original score, wind and wave motion, four characters who can interact, tactical combat, and full-color dungeons combine with much more solid, involved plot to make an engrossing fantasy. Origin Systems, Box 99, N. Andover, MA 01845. $54.95. *11/83.*

Knight of Diamonds. Greenberg, Woodhead. Second scenario of Wizardry, requiring thirteenth-level characters from the original. Individual quests on each of six dungeon levels. Great. Sir-tech, 6 Main St., Ogdensburg, NY 13669. $34.95. *7/82.*

Legacy of Llylgamyn. Greenberg, Woodhead. Third scenario in classic Wizardry series. To save Llylgamyn, descendants of the adventurers of other Wizardry scenarios (requires *Overlord*) must wrest a mystical orb from the dragon L'kbreth. New full-screen dungeon, Lisa-like information screens. Sir-tech, 6 Main St., Ogdensburg, NY 13669. $39.95. *7/83.*

• **Odyssey: The Compleat Apventure.** Clardy. Fantasy adventure far beyond one place and one setting. Castles, catacombs, an ocean voyage, and the orb of power. Synergistic, 830 N. Riverside Dr., #201, Renton, WA 98055. $30. *10/80.*

Standing Stones. Schmuckal, Sommers. Fifteen levels, 200 monsters, humor, and 3-D perspective in dungeon role-playing adventure. Electronic Arts, 2755 Campus Dr., San Mateo, CA 94403. $40.

• **Temple of Apshai.** Lead title in Dunjonquest series, winner 1981 Academy of Adventure Gaming Arts and Design "Computer Game of the Year" award. Epyx/Automated Simulations, 1043 Kiel Ct., Sunnyvale, CA 94086. $39.95.

• **Ultima.** British. Hi-res color adventure, progressing from Middle Ages to beyond the space age. A masterpiece. California Pacific, 757 Russell Blvd., Davis, CA 95616. $39.95. *6/81.*

Ultima II. British. Faster play in a bigger universe with a time-travel option. Typically British look and feel. Events are much more interdependent; larger realm of fantasy with more transactions available. Sierra On-Line, Sierra On-Line Building, Coarsegold, CA 93614. $59.95.

• **Wilderness Campaign.** Clardy. First fantasy game to leave the dungeon for the great outdoors; first in hi-res; first to bargain with merchants; and more. Synergistic, 830 N. Riverside Dr., #201, Renton, WA 98055. $17.50.

• **Wizardry.** Greenberg, Woodhead. Ultimate role-playing fantasy; ten-level maze in hi-res. Generate 20 characters, six at a time on expeditions. Gripping game; superbly reproduced. Sir-tech, 6 Main St., Ogdensburg, NY 13669. $49.95. *8/81.*

Graphics

Alpha Plot. Kersey, Cassidy. Hi-res graphics and text utility with optional xdraw cursor and proportional spacing. Beagle Bros, 4315 Sierra Vista, San Diego, CA 92103. $39.50.

The Complete Graphics System. Pelczarski. A wealth of graphics tools at a reasonable price. Make 2-D drawings with game paddles; add text in destructive, nondestructive, or reverse modes; create 3-D figures and shape tables. Manual features complete outline of command structure. Penguin, Box 311, Geneva, IL 60134. $69.95. *7/81.*

Doublestuff. Bonfiglio, Joselow. Programming language similar to Applesoft designed for use with Apple's stunning double-resolution modes. Requires IIe with B motherboard, 128K. Doublestuff Software Development, 2053 W. 11th St., Brooklyn, NY 11223. $39.95. *12/83.*

Flow Charting. Patton. Elegantly solves problems of designing and printing flowcharts. Fun, easy-to-use, powerful. Patton and Patton, 340 Lassenpark Circle, San Jose, CA 95136. $138. *12/83.*

Flying Colors. Albinger, Norby. Track ball or joystick controls eleven brush-tips, sixteen diagonal and crosshatched color patterns, four solid colors, two blacks, two whites, circle and box functions, freehand drawing, and a micro mode for detail work. Friendly and fun. Computer Colorworks, 3030 Bridgeway, Sausalito, CA 94965. $39.95. *3/84.*

Fontpak 1-3. Additional character sets for use with *Fontrix*. *Fontpak 1* for headline and decorative type, *Fontpak 2* for art and technical type, *Fontpak 3* for letterforms and posters. Data Transforms, 616 Washington St., Denver, CO 80203. $20 each.

Fontrix. Boker, Houston. Character generator creates unlimited number of typefaces, uses them to write on a screen extended 16 times. Extremely significant development in graphics. Data Transforms, 616 Washington St., Denver, CO 80203. $75. *7/83.*

The Graphics Magician. Jochumson, Lubar, Pelczarski. Outstanding animation package consisting of picture editor and shape-table extender. Comes with utility program to transfer binary files. Penguin, Box 311, Geneva, IL 60134. $59.95. *5/82.*

The Graphic Solution. Graphics editor and bit-mapping animation system using film-editing techniques. Save hi-res screen as standard DOS file. No programming knowledge necessary. Accent, 3750 Wright Pl., Palo Alto, CA 94306. $149.95. *7/83.*

• **LPS II.** Superb hi-res-graphics drawing system

with light pen. Draw freehand or use circles and lines to create geometric shapes. Fill routine with colors and patterns; fun animation demo; programmable Pentrak driver. Gibson, 23192-D Verdugo Dr., Laguna Hills, CA 92653. $349. *10/82.*

Picture Writer. Brackett. Intended for kids five through fifteen. Uses joystick to draw lines, draw and squeeze circles and rectangles. Twenty-one colors, musical accompaniment. Possibly too difficult to control for targeted users. Requires 64K. Scarborough Systems, 25 N. Broadway, Tarrytown, NY 10591. $39.95. *3/84.*

Special Effects. Pelczarski. Artist's graphic package for creating and enhancing computer graphics. With 108 colors, 96 brushes, magnification and editing point-by-point. Reverse colors, create mirror images, move images. Penguin, Box 311, Geneva, IL 60134. $39.95. *3/82.*

Zoom Grafix. Holle. Graphics-printing utility allows display of picture on-screen prior to print; prints out selected portion at any size. Phoenix, 64 Lake Zurich Dr., Lake Zurich, IL 60047. $39.95. *2/82.*

Home

✓ **Basic Accounting.** Jarvis. Single-entry home accounting program, ideal for home budgeting. Performs inventories and automatic transactions, provides graphics and a wide variety of reports. File names up to twenty-five characters. Firefighter, 31245 La Baya Dr., Westlake Village, CA 91362. $89. *4/84.*

• **Crossword Magic.** Crossword puzzle maker. Choose subject, words, and clues; program automatically connects words. Play on-screen or make printout. L&S Computerware, 1589 Fraser Dr., Sunnyvale, CA 94087. $49.95. *10/81.*

Dollars and Sense. Mullin. Establishes budgets, writes checks, reminds to pay bills. Uses graphs, reports to analyze cash flow, balance sheets, make year-to-date summaries, expense projections. Monogram, 8295 S. La Cienega Blvd., Inglewood, CA 90301. $100.

Golf Statistician. Haberle. Helps golfers lower their scores by examining their strengths and weaknesses. GolfSoft, 10333 Balsam Ln., Eden Prairie, MN 55344. $34.95.

Home Accountant. Schoenburg. Thorough, powerful home finance program. Monitors five checking accounts against a common budget, plus credit cards and cash; one-step record or transfer of funds. Continental, 11223 S. Hindry Ave., Los Angeles, CA 90045. $74.95. *4/82.*

✓ **Internist.** Based on the *Merck Manual*, assesses 450 symptoms to assist in diagnosis of 331 common diseases. Prints diagnoses and references. Requires 64K. N-Squared, 5318 Forest Ridge Rd., Silverton, OR 97381. $95.

Match-Wits. Cooper. An engrossing and educational variation of the TV show *Concentration*. Try to score points by matching items and by guessing the phrase represented in pictures and numbers. Categories include famous people, sports, and others. CBS Software, 1 Fawcett Pl., Greenwich, CT 06836. $29.95. *3/84.*

Micro Cookbook. Recipe-management system allows entry and modification; selection of recipes by common ingredients, name, or classification. Calorie and nutrition guide. Virtual Combinatics, Box 755, Rockport, MA 01966. $40. *6/83.*

Money Street. Easy-to-use checkbook financial system for small business, office, or home use. Keeps books, tracks deductions, helps cut expenses. CTS, Box 4845, Incline Village, NV 89450. $99.95. *9/83.*

Music Construction Set. Harvey. Interactive music composition and learning tool allows user to create music or experiment with included music library. Electronic Arts, 2755 Campus Dr., San Mateo, CA 94403. $40. *12/83.*

Oddsmaker. Zieg. Do-it-yourself parimutuel betting system for office pools, sporting events, you name it. Allows for up to fourteen pools, prints tickets, calculates odds. CZ Software, 358 Forest Rd., South Yarmouth, MA 02664. $44.95. *3/84.*

Tax Advantage. Assists with Form 1040 and related tax schedules. Simulates the 1040 on-screen, averages income, explains each item on the form. Continental, 11223 S. Hindry Ave., Los Angeles, CA 90045. $69.95.

Tax Preparer. Record-keeping program with wide variety of federal tax forms and schedules; creates itemized lists. Yearly updates. Howard Software, 8008 Girard Ave., #310, La Jolla, CA 92037. $225. *3/81.*

Time Is Money. Flexible personal accounting package. Checkbook balancing with a full statement on-screen. Tracks up to 240 separate assets and liabilities. Turning Point, 11A Main St., Watertown, MA 02172. $100. *4/84.*

WordWorx. Christie, Weisberg. Fun-with-language program composed of two parts: Myspellery explains why *ghoti* is pronounced "fish"; Sentence Maker tests knowledge of common mottoes and expressions. Fun for eighth-graders and grad students alike. Reston Publishing, 11480 Sunset Hills Rd., Reston, VA 22090. $34.95. *3/84.*

Home-Arcade

Fast-action skill games, may include elements of fantasy.

• **Alien Rain.** Suzuki. Monsters in this classic seem to take it personally when you gun down one of their own kind. Broderbund, 17 Paul Dr., San Rafael, CA

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94903. $29.95. *9/81.*

• **Apple Panic.** Serki. Rid a five-story building of crawling apples and butterflies by running up and down connecting ladders, digging traps, then covering critters before they devour you. Extremely addictive, excellent hi-res play. Broderbund, 17 Paul Dr., San Rafael, CA 94903. $29.95. *9/81.*

✓ **B.C.'s Quest for Tires.** Grey. Jump over rocks and potholes, bounce across a river on the backs of turtles, fly over lava, confront a dinosaur, in an effort to save the first woman. Cartoon look, slow play. Sierra On-Line, Sierra On-Line Building, Coarsegold, CA 93614. $34.95.

Beagle Bag. Kersey. Twenty games and miscellany, written in Basic and unprotected. Great humor, good two-player games. Manual is worth the price of admission. Beagle Bros, 4315 Sierra Vista, San Diego, CA 92103. $29.50. *1/83.*

Bouncing Kamungas. Becklund. Sound is okay, animation good, premise original, action intense. One of Penguin's best arcaders. Penguin, Box 311, Geneva, IL 60134. $29.95. *12/83.*

Centipede. Save the mushroom patch from invading centipedes, scorpions, spiders, and fleas in Apple rendition of arcade classic. Atarisoft, 1265 Borregas Ave., Box 427, Sunnyvale, CA 94086. $34.95. *4/84.*

• **Choplifter.** Gorlin. Fly your chopper to rescue 64 hostages, avoiding interceptor jets, homing mines, and tanks. Challenging, realistic, and playful. Stunning graphics. Broderbund, 17 Paul Dr., San Rafael, CA 94903. $34.95. *7/82.*

• **Crossfire.** Sullivan. Critters come at you from four directions on a grid laid out like city blocks. Strategy and intense concentration required. Superb, smooth animation of a dozen pieces simultaneously. One of the great ones. Sierra On-Line, Sierra On-Line Building, Coarsegold, CA 93614. $29.95. *1/82.*

Defender. Fly and shoot, fly and shoot, and don't forget to save the planet. Atarisoft, 1265 Borregas Ave., Box 427, Sunnyvale, CA 94086. $34.95. *3/84.*

Dig Dug. Dig Dug moves horizontally and vertically, burrowing tunnels in search of vegetables. Hidden monsters make his task tougher. Atarisoft, 1265 Borregas Ave., Box 427, Sunnyvale, CA 94086. $34.95.

Dr J and Larry Bird Go One-on-One. Hammond, Bird, Erving. Graphically and intrinsically captures the moves, grace, and bearing of basketball forwards Dr J and Larry Bird as they play one on one. The best video basketball imaginable, for one or two players. Electronic Arts, 2755 Campus Dr., San Mateo, CA 94403. $40. *2/84.*

Donkey Kong. Mario the carpenter climbs girders and rides elevators to reach the top of a building where a giant gorilla holds his sweetheart captive. Try to keep him from falling or getting bumped off. Atarisoft, 1265 Borregas Ave., Box 427, Sunnyvale, CA 94086. $34.95.

Drol. Ngo. Charming rescue mission set in a dream world with witch doctors, Garfield-like scorpions, kamikaze vacuum cleaners. Marvelous, smoothly animated graphics; challenging and playable. Broderbund, 17 Paul Dr., San Rafael, CA 94903. $34.95. *12/83.*

Frogger. Lubeck. Not even close. Sierra On-Line, Sierra On-Line Building, Coarsegold, CA 93614. $34.95. *12/82.*

• **Gorgon.** Nasir. Fly over planet shooting and dodging invaders and saving kidnapped inhabitants. Outstanding hi-res graphics, challenging refueling sequence. Sirius, 10364 Rockingham Dr., Sacramento, CA 95827. $39.95. *8/81.*

Hard Hat Mack. Abbot, Alexander. Poor Mack. He must avoid vandals, inspectors, falling rivets, and hungry cement mixers to complete his building. Electronic Arts, 2755 Campus Dr., San Mateo, CA 94403. $35. *7/83.*

✓ **The Heist.** Livesay, Mooney. Similar to Livesay's Apple version of *Miner 2049er*; pick up all of the artwork in sixteen-level museum. Passive—no one is chasing you—but challenging. Micro Lab, 2699 Skokie Valley Rd., Highland Park, IL 60035. $35.

• **Lode Runner.** Smith. One hundred fifty unique levels in super run-climb-dig-jump game—or design your own puzzles, scenes, and setups—in quest to retrieve stolen gold from the Bungeling Empire. Voted Most Popular Program of 1983. Broderbund, 17 Paul Dr., San Rafael, CA 94903. $34.95. *8/83.*

• **Meteoroids (Asteroids) in Space.** Wallace. Make little asteroids out of big ones, plus occasional hostile alien ships. Hyperspace, autobrake, autofire. Quality Software, 21601 Marilla St., Chatsworth, CA 91311. $19.95.

• **Microsoft Decathlon** (formerly *Olympic Decathlon*). Smith. Ten standard decathlon events. Hi-res animated athletes, muscle-stirring music; you provide the sweat. Microsoft, 10700 Northup Wy., Bellevue, WA 98004. $29.95. *6/81.*

Miner 2049er. Livesay, Hogue. Run, jump, climb, and slide through the mines, reinforcing the groundwork along the way. Elevators, cannons, chutes, and ladders help; mutants don't. Hot stuff, best of the genre. Micro Lab, 2699 Skokie Valley Rd., Highland Park, IL 60035. $39.95. *1/83.*

Pac-Man. Official, original eat-'em-up arcade giant now available for the Apple II. Atari, Box 2943, S. San Francisco, CA 94080. $34.95.

Pinball Construction Set. Budge. Design and play your own computer games on-screen, with zero programming. A miracle of rare device. Superior. BudgeCo, 428 Pala Ave., Piedmont, CA 94611. $39.95. *2/83.*

• **Pool 1.5.** Hoffman, St. Germain, Morock. Makes most shots you could on a real pool table, with the advantages of instant replay and slow motion. Four different games. IDSI, Box 1658, Las Cruces, NM 88004. $34.95. *6/81.*

• **Raster Blaster.** Budge. First realistic pinball game. *Softalk* readers' Most Popular Program of 1981. BudgeCo, 428 Pala Ave., Piedmont, CA 94611. $29.95. *5/81.*

Robotron: 2084. The world's turned bad 100 years later than expected. Save the last of the race from marauding robot monsters. Atarisoft, 1265 Borregas Ave., Box 427, Sunnyvale, CA 94086. $34.95.

Sammy Lightfoot. Schwader. Sammy must dodge a variety of obstacles as he tries out for the circus. He evidently used to be a miner. Sierra On-Line, Sierra On-Line Building, Coarsegold, CA 93614. $29.95.

Spare Change. Zeller, Zeller. Bright graphics, ultrasmooth animation, clever sound effects, and cute characters add up to create an instant classic—the first computer slapstick comedy. Broderbund, 17 Paul Dr., San Rafael, CA 94903. $34.95. *11/83.*

Spy's Demise. Zeldin, Hardy. Be the first on your block to run a maze of pile-driving elevators. Fast, frustrating fun. Complete puzzle after all nine levels. Penguin, Box 311, Geneva, IL 60134. $29.95. *11/82.*

The Spy Strikes Back. Hardy, Pelczarski. Follow-up to *Spy's Demise* proves that sequels are sometimes better. This one's a sneak-and-hide game, technically impressive, challenging, and lots of fun. Penguin, Box 311, Geneva, IL 60134. $29.95. *10/83.*

Stargate. Crisper, smoother, faster version of *Defender*. The radar is poor, but the action more than compensates. Atarisoft, 1265 Borregas Ave., Box 427, Sunnyvale, CA 94086. $34.95. *3/84.*

Stellar 7. Slye. It's you against the Arcturan world in excellent 3-D animated arcader. Seven levels, 14 types of enemies to blast in quest of the alien armada. Software Entertainment, 537 Willamette St., Eugene, OR 97401. $34.95. *9/83.*

• **Super Invader.** Hata. Progenitor of home arcades. Still good hi-res, still a challenge. *Softalk* readers' Most Popular Program of 1978-80. Astar International, through Creative Computing, 39 E. Hanover Ave., Morris Plains, NJ 07960. $19.95.

Zaxxon. Garcia. 3-D scrolling air raid brought to the Apple with little sacrifice in playability. Datasoft, 9421 Winnetka Ave., Chatsworth, CA 91311. $39.95. *9/83.*

Home Education

Apple Logo. Papert. Custom version (by its inventor) of turtle graphics language. First-rate educational tool. Great kid-friendly documentation. Apple, 20525 Mariani Ave., Cupertino, CA 95014. $175.

Apple II–6502 Assembly Language Tutor. Haskell. This book/disk combination explains the 6502 microprocessor, low-level programming, binary and hexadecimal arithmetic; exposes beginners to writing machine language without an assembler, hardware development, and more. A superb teacher for adventurous spirits. Prentice-Hall, Englewood Cliffs, NJ 06732. $34.95. *3/84.*

Arcademic Skill Builders in Math. Chafin, Maxwell. *Alien Addition*, *Alligator Mix*, *Demolition Division*, *Dragon Mix*, *Meteor Multiplication*, and *Minus Mission*. Arcade action blended with addition, subtraction, multiplication, and division problems. Shooting correct answers to problems gets rid of pesky attackers. Choose speed, difficulty levels, game length. Developmental Learning Materials, 1 DLM Park, Allen, TX 75002. $29.95 each. *7/83.*

Barron's SAT. Pinpoints students' strengths and weaknesses, outlines study program. Four complete SATs in two modes. Question mode explains answers, suggests strategies, gives hints. Test mode scores answers, gives scaled SAT score. Barron's, 113 Crossways Pk. Dr., Woodbury, NY 11797. Three disks, guides, $89.95.

Compu-Read. EduWare. Set of programs develops speed and retention in reading. Stresses character and word recognition, comprehension. Peachtree Software, 3445 Peachtree Rd., N.E., #830, Atlanta, GA 30326. $29.95.

Computer SAT. Prepares college-bound students for admittance test. Diagnoses strengths, weaknesses; creates study plan, exercises. Harcourt Brace Jovanovich, 1250 6th Ave., San Diego, CA 92101. $79.95.

Computer Training Tapes. Robinson. Three audiocassette tapes and disk teach computer literacy. Examines hardware, DOS and DOS Sample Programs disk, and introductory programming. Beneficial even to experienced users. Personal Tutor Associates, Box 246, Clinton, MD 20735. $49.95. *3/84.*

Counting Bee. Conrad. Introduces young children to counting, addition, subtraction, shape discrimination, weight, and measurement. Ages four to eight. Peachtree Software, 3445 Peachtree Rd., N.E., #830, Atlanta, GA 30326. $29.95.

Delta Drawing. Kids can make colorful drawings by using single-key commands. No special talent needed; this one develops programs that create complex graphics. Spinnaker, 215 1st St., Cambridge, MA 02142. $59.95. *11/82.*

Early Games for Young Children. Paulson. Basic training in numbers, letters, Apple keyboard for children ages two to seven with no adult supervision. Has a neat little drawing program. Counterpoint Software, 4005 W. 65th St., Minneapolis, MN 55435. $29.95. *11/82.*

Early Games Fraction Factory. Eyestone. Aided by colorful graphics and music, children see and describe fractions, find equal values with different denominators, multiply whole numbers by fractions, add and subtract fractions. Ages 8 to 12. Counterpoint Software, 4005 W. 65th St., Minneapolis, MN 55435. $29.95.

Early Games Matchmaker. Adolf, Boody. Helps children aged two to six develop matching, grouping, and discrimination skills. Requires no knowledge of keyboard; does require adult supervision. Counterpoint Software, 4005 W. 65th St., Minneapolis, MN 55435. $29.95. *2/84.*

Early Games Music. Paulson. Illustrates music with fun and theory. Children compose music and set to graphics or learn note reading and piano keyboard.

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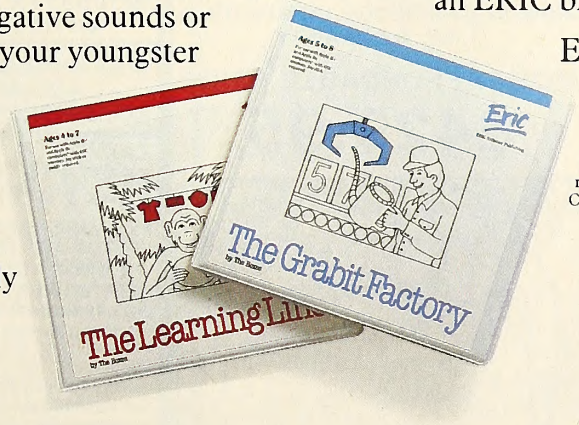

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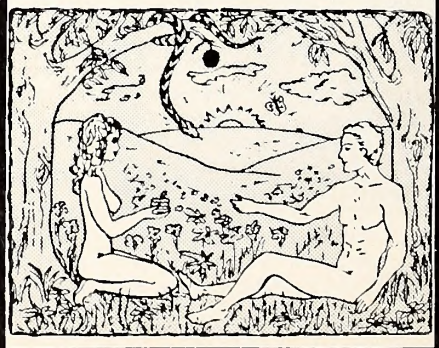

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Counterpoint Software, 4005 W. 65th St., Minneapolis, MN 55435. $29.95. *8/83.*

Early Games Piece of Cake. Eyestone. Kids become baker's assistants; adding, multiplying, subtracting, dividing cakes. Includes CatchaCake, a problem-solving race against time to stop a cake from falling. Counterpoint Software, 4005 W. 65th St., Minneapolis, MN 55435. $29.95. *10/83.*

Facemaker. DesignWare. Exercises kids' creativity and introduces programlike command sequencing as kids create faces and link them together in animated patterns. Spinnaker, 215 1st St., Cambridge, MA 02142. $34.95.

Fractions. EduWare. Hi-res addition, subtraction, multiplication, and division of fractions. With learning manager system. Peachtree Software, 3445 Peachtree Rd., N.E., #830, Atlanta, GA 30326. $49.

• **French Hangman, Latin Hangman, Spanish Hangman.** Protelsch, Earl. Hangman games that tell you the answer—in a foreign language. Interesting sentences, many formats. Addicting! George Earl, 1302 S. General McMullen, San Antonio, TX 78237. Two-sided disk, $29.95. *9/83.*

Game Show. Guess mystery words from clues given by "celebrity" partners—no threat to Liz Montgomery. Fifteen subjects cover vocabulary, history, algebra, and more. Add topics. Advanced Ideas, 1442A Walnut St., #341, Berkeley, CA 94709. $39.

• **Gertrude's Secrets.** Gertrude the Goose teaches four- to nine-year-olds shape and color relationships. Solve logic puzzles, create forms. The Learning Co., 545 Middlefield Rd., #170, Menlo Park, CA 94025. $44.95. *2/83.*

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Krell Logo. Concentrates on underlying principles of Logo; sections on assembly language interfaces and music creation, plus Alice in Logoland tutorial. Krell, 1320 Stony Brook Rd., Stony Brook, NY 11790. $89.95. *7/82.*

✓ **Learning and Loving It! Division of Whole Numbers.** Borns. Makes learning long division as palatable as possible. Race Apple Annie to the remainder in entertaining beginning level. Intermediate and advanced levels soberly studious. Borns Software, 19841 Sea Canyon Circle, Huntington Beach, CA 92648. $39.95. *4/84.*

The Learning Line. Helps children four through seven understand relationships between letters, words, numbers, pictures. Uses only joystick and escape key, teaches without negative feedback. Eric Software, 1713 Tulare, Fresno, CA 93721. $39.95. *3/84.*

• **MasterType.** Zweig. Learn to type by playing a game; simple and ingenious. IIe version teaches new keyboard. Lightning, Box 11725, Palo Alto, CA 94306. $39.95. *4/81.*

Math Blaster. Davidson, Eckert. Elementary-school-level training in four basic math functions. Options to create lessons; several levels of difficulty for various ages. Human cannonball arcade game for each function. Davidson & Associates, 6069 Groveoak Pl., #12, Rancho Palos Verdes, CA 90274. $49.95.

Micro-LADS. Six-disk package for the learning- and hearing-disabled. Animated characters teach rules of grammar. Variable levels, color. Requires Echo II speech synthesizer. Laureate Learning Systems, 1 Mill St., Burlington, VT 05401. Six disks and Echo II speech synthesizer, $650. Individual disks, $170 each.

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• **The New Step by Step, Step by Step Two.** *The New Step by Step* teaches beginning programming. *Step by Step Two* teaches intermediate Basic programming, peek and poke, hexadecimal numbers, concatenations, and more. Program Design, 11 Idar Ct., Greenwich, CT 06830. $89.95. *7/83.*

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Spelling Bee Games. EduWare. Hi-res games strengthen eye-hand coordination, memory, motor skills. Word lists include shapes, animals, more. Peachtree Software, 3445 Peachtree Rd., N.E., #830,

Atlanta, GA 30326. $29.95. *5/83.*

Stickybear. Hefter, Worthington, Rice, Howe. Animated early education programs. In *Stickybear ABC*, moving pictures with sound represent letters. In *Stickybear Numbers*, groups of moving objects teach numbers and simple arithmetic. Ages three through six. In *Stickybear Bop*, ducks, planets, and balloons bop across screen in three shooting galleries. For all ages. In *Stickybear Shapes*, animated pictures teach shape recognition. In *Stickybear Opposites*, Stickybear and friends illustrate opposites. Weekly Reader Family Software, 245 Long Hill Rd., Middletown, CT 06457. $39.95 each. *Numbers*, *ABC*, *Bop*, *5/83*. *Shapes*, *12/83*. *Opposites*, 3/84.

Story Machine. Helps develop positive attitude toward writing and ability to write correctly. Words come to life when sentence is acted out on-screen. Kids five to nine love to type "The Bumpus zots the tree" and see it do so. Spinnaker, 215 1st St., Cambridge, MA 02142. $34.95.

✓ **Supermap.** Maps show ecological regions, geographical features, time zones. Shows cities and tells population, latitude, longitude, principal post office zip code and area codes. For kids 10 to 15. Softsmith, 1431 Doolittle Dr., San Leandro, CA 94577. $39.95.

Sweet Shoppe. Boxes, Daus, Murrays. Mr. Jellybean and three instructive arcade games teach kids four to seven counting, subtraction, and addition of numbers 1 through 10. Colorful graphics, simple plot. Eric Software, 1713 Tulare, Fresno, CA 93721. $39.95. *3/84.*

Terrapin Logo. MIT. The Logo language, using a Terrapin turtle to teach state, control, and recursion. Terrapin, 380C Green St., Cambridge, MA 02139. $149.95.

Tic Tac Show. Teaches facts and concepts about the world in general. Solo or double play; add topics. Advanced Ideas, 1442A Walnut St., Berkeley, CA 94709. $39.95.

Type Attack. Hauser. Learn to type while defending the planet Lexicon from invaders. IIe version teaches IIe keyboard. Sirius, 10364 Rockingham Dr., Sacramento, CA 95827. $39.95.

Typing Tutor. Ainsworth, Baker. Four levels of proficiency; individualized drills created with time-response monitoring. Microsoft, 10700 Northup Wy., Bellevue, WA 98004. $24.95.

Strategy

Thinking, planning, plotting games, from war games to backgammon to cards.

Carrier Force. Grigsby. Four World War II naval scenarios. Realistic reenactment of gut-wrenching battles. For one or two players. Strategic Simulations, 883 Stierlin Rd., A-200, Mountain View, CA 94043. $59.95.

• **Castle Wolfenstein.** Warner. First game to fuse successfully strategy, home-arcade, fantasy. Escape from Nazi stronghold with secret plans. Room layout changes with each new game. Enemy speaks (in German). Muse, 347 N. Charles St., Baltimore, MD 21201. $29.95. *10/81.*

• **Computer Ambush.** Williger. Gutty soldier-to-soldier street fighting in World War II France. Latest version is 40 times faster than the original, which was one of the best games ever created for Apple, except for slowness. Strategic Simulations, 883 Stierlin Rd., A-200, Mountain View, CA 94043. $59.95.

• **Computer Baseball.** Merrow, Avery. Simulates individual player abilities from the teams of 13 famous World Series. Enter and play teams of your own creation. Strategic Simulations, 883 Stierlin Rd., A-200, Mountain View, CA 94043. $39.95. *9/81.*

• **Flight Simulator.** Artwick. Uses aerodynamic equations, airfoil characteristics for realistic takeoff, flight, and landing. Two years on Top Thirty. SubLogic, 713 Edgebrook Dr., Champaign, IL 61820. $33.50.

Flight Simulator II. Artwick. Update of the original *Flight Simulator* features animated 3-D color graphics, transcontinental flight, World War I aerial battle. SubLogic, 713 Edgebrook Dr., Champaign, IL 61820. $49.95.

Geopolitique 1990. Ketchledge, Billings. Diplomatic, economic, and military simulation that pits the United States against the Soviet Union in a struggle for world supremacy. Features two phases: global diplomacy and geowar, a simulation of nonnuclear combat. For one player. Strategic Simulations, 883 Stierlin Rd., A-200, Mountain View, CA 94043. $39.95. *10/83.*

Gin Rummy. Carpet. Play against computer. Hi-res hand can be arranged. Knocking allowed. Computer plays pretty well. Datamost, 8943 Fullbright Ave., Chatsworth, CA 91311. $29.95. *6/82.*

Hi-Res Computer Golf 2. A masterpiece; requires judgment, strategy, and visual acuity. One of the few computer sports simulations that require dexterity. Avant-Garde, Box 30160, Eugene, OR 97403. $34.95. *6/83.*

• **Microgammon II.** Program for play, practice, improvement of backgammon skills. Pretty good competition. Softape, 5547 Satsuma Ave., North Hollywood, CA 91601. $19.95. *2/81.*

Millionaire. Zuber. Investment simulation lets you know if you have what it takes to make a quick million in the stock market. Every little market fluctuation represented on a weekly basis, includes investment tips. Blue Chip Software, 6744 Eton Ave., Canoga Park, CA 91303. $59.95. *12/83.*

• **Pensate.** Besnard. Chess-type thinking game with new tactics. Computer's many pieces move in relation to player's piece; each of 10 types of computer pieces has unique rules. Makes full use of computer capabilities. Intriguing, progressive, and addictive. Penguin, Box 311, Geneva, IL 60134. $29.95. *7/83.*

✓ **Professional Tour Golf.** Richbourg. Determine the average distance of your drive and the precision of your putts and then stride the links with Palmer and Nicklaus or a friend or three. Two courses, lots of hazards. Strategic Simulations, 883 Stierlin Rd., A-200, Mountain View, CA 94043. $39.95. *4/84.*

✓ **Rails West!** Thar's fortunes can be made in railroads, sonny. It's 1870; start a corporation or orchestrate a takeover. Choose level of play, number of players—up to eight—and scenario, ranging from boom times to panic. Strategic Simulations, 883 Stierlin Rd., A-200, Mountain View, CA 94043. $39.95.

• **RobotWar.** Warner. Strategy game with battling robots is great teaching device for programming. Muse, 347 N. Charles St., Baltimore, MD 21201. $39.95. *1/81.*

• **Sargon III.** Spracklen, Spracklen. Plays good chess fast. Much improved from *Sargon II*, contains 107 classic games from the past for instruction or entertainment. Hayden, 600 Suffolk St., Lowell, MA 01853. $49.95. *10/83.*

Utility

Apple Mechanic. Kersey. Multiple disk utility with shape editor, custom typefonts, byte rewriter, and tricks to facilitate music, text, and hi-res generation. Beagle Bros, 4315 Sierra Vista, San Diego, CA 92103. $29.50. *9/82.*

Apple Mechanic Typefaces. Twenty-six new fonts for use with *Apple Mechanic*. Beagle Bros, 4315 Sierra Vista, San Diego, CA 92103. $20.

Beagle Basic. Simonsen. Allows you to enhance and customize Applesoft by adding up to 12 functions. Beagle Bros, 4315 Sierra Vista, San Diego, CA 92103. $34.95. *10/83.*

Copy II Plus. All you need to back up disks, manipulate files, and test your disk system. Includes bit copy program, documentation. Central Point Software, Box 19730-#203, Portland, OR 97219. $39.95.

DiskQuik. Bruce, Hite. Uses an extended 80-column

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card to make the Apple IIe think a disk drive is connected to slot three. Eighty-column card holds about half as much data as a disk. Beagle Bros, 4315 Sierra Vista, San Diego, CA 92103. $29.50.

Diversi-DOS. Basham. Well-documented, copyable program speeds up disk access, buffers keyboard input. Can be placed on RAM card; sets up RAM card as print buffer. DSR, 5848 Crampton Ct., Rockford, IL 61111. $30. *5/83.*

DOS Boss. Kersey, Cassidy. Utility to change DOS commands, customize catalog. Good ideas and witty presentation. Beagle Bros, 4315 Sierra Vista, San Diego, CA 92103. $24. *10/81.*

DOS 3.3. Increases disk storage capacity more than 20 percent over 3.2. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. $60.

Double-Take. Simonsen. Multiple utility features two-way scrolling for listings and catalogs. Improved list format. Beagle Bros, 4315 Sierra Vista, San Diego, CA 92103. $34.95. *10/83.*

Einstein Compiler. Goodrow, Einstein. Translates Applesoft programs into machine language for runtime up to 20 times faster. Supports all graphics modes, defined functions, and DOS commands. Einstein, 11340 W. Olympic Blvd., Los Angeles, CA 90064. $129. *5/83.*

Flex Type. Simonsen. Adds graphics to text and vice versa; prints variable-width text with no hardware. Beagle Bros, 4315 Sierra Vista, San Diego, CA 92103. $29.50.

Frame-Up. Weishaar. High-speed display utility generates professional presentations of graphics, text frames. Text screen editor lets you create text slides, add type live during shows. Optional preprogrammed display for unattended shows. Beagle Bros, 4315 Sierra Vista, San Diego, CA 92103. $29.50.

• **Global Program Line Editor.** Enhanced version of *Program Line Editor* with programmable cursor and listing control. Edit line by line or by range of lines and search for strings. Beagle Bros, 4315 Sierra Vista, San Diego, CA 92103. $49.95. *12/82.*

Master Diagnostic II, II Plus, and IIe. Romano. Identifies bad ROM and RAM chips, parallel cards, video monitor, speaker, paddles, disk drive speed, head alignment, and write-protect switch. Gives hardware repair, replacement, and cleaning instructions where viable. Nikrom Technical Products, 25 Prospect St., Leominster, MA 01453. $55.

Merlin. Does assembly language programming with a dozen editing commands and 28 pseudo-ops. Roger Wagner Publishing, 10761-E Woodside Ave., Santee, CA 92071. $64.95. *1/83.*

ProntoDOS. Weishaar. High-speed disk utility cuts about two-thirds of the time off bload and save functions. Compatible with all DOS commands; frees up to 15 extra sectors per disk. Beagle Bros, 4315 Sierra Vista, San Diego, CA 92103. $29.50.

Silicon Salad. Kersey, Simonsen. Grab bag of utilities including Applesoft error trapper, fast word alphabetizer, and a disk scanner that seals off bad sectors. Features Tip Disk #2 and Beagle Blackjack. Beagle Bros, 4315 Sierra Vista, San Diego, CA 92103. $24.95. *4/84.*

• **Super Disk Copy III.** Hartley. Easy-to-use menu-driven software utility; correct file sizes, undelete, free DOS tracks, more. Sensible, 6619 Perham Dr., W. Bloomfield, MI 48003. $30. *10/81.*

Tip Disk #1. Kersey. One hundred *Beagle Tip Book* programs on disk. Includes Apple command chart and peeks/pokes chart. Beagle Bros, 4315 Sierra Vista, San Diego, CA 92103. $20.

Utility City. Kersey. Twenty-one utilities on one disk. Beagle Bros, 4315 Sierra Vista, San Diego, CA 92103. $29.50.

XPS-Diagnostic. Peters. Comprehensive hardware diagnostic utility by author of *Apple Cillin* includes graphic display of bad memory chips, tests for printers, RAM, ROM, and peripheral cards. XPS, 323 York Rd., Carlisle, PA 17013. $49.95. *4/84.*

Word Processing

Apple Writer II and IIe. Includes WPL (word processing language). Additional functions menu; continuing features and functions menu; continuous readout of characters and length. *IIe* has shift, shift-lock, and tab, four-arrow cursor control, and delete key; data files compatible with *II.* Apple, 20525 Mariani Ave., Cupertino, CA 95014. *II,* $150; *IIe,* $195.

Apple Writer II Preboot. Armstrong, Borgersen. Allows you to run *Apple Writer II* in 80-column format with the Videoterm 80-column card. Videx, 1105 N.W. Circle Blvd., Corvallis, OR 97330. $19.

Bank Street Writer. Kusmiak, Bank Street College of Education. Designed for use by whole family. Universal search and replace, word wrap are standard. U/lc without hardware. On-disk tutorial. Takes advantage of memory, keyboard on IIe, if you have one. Broderbund, 17 Paul Dr., San Rafael, CA 94903. $69.95. *2/83.*

Format-II, Enhanced Version. Hardwick, Beckmann. Word processor supports all popular 80-column cards, stores up to 50 pages of text on one disk. Includes single keystroke editor, mailing list database; displays text on-screen exactly as it will print out. Compatible with hard disk drives. Kensington Microware, 919 3rd Ave., New York, NY 10022. $150.

HomeWord. TC Computer Systems. Icon-operated, displays print-formatted document on screen, mixes bold, underlined, or regular type. Tiny window displays page format. Automatic outline formatting. Sierra On-Line, Sierra On-Line Building, Coarsegold, CA 93614. $49.95. *12/83.*

Magic Window II. Forty, 70 (in hi-res), or 80 columns in this expanded version. With user-tailored, fast menu, underlining, global search and replace. IIe version uses all 64K. Artsci, 5547 Satsuma Ave., North Hollywood, CA 91601. $149.95.

PFS:Write. Edwards, Crain, Leu. Interfaces with other PFS programs. Includes search and replace, moving and duplicating of text blocks, help screens. Document appears on screen as it will look when printed—including page breaks, underlining, boldfacing. Software Publishing, 1901 Landings Dr., Mountain View, CA 94043. $125. *12/83.*

• **Sensible Speller.** Hartley. Spell-checking program sports listable 85,000 words, extensible up to 110,000 words. Recognizes contractions, gives word counts, word incidence, number of unique words. Clear documentation and simplicity of operation. Works with many word processors' files. Best of breed. Sensible, 6619 Perham Dr., W. Bloomfield, MI 48033. $125. *11/82.*

Word Handler II. Elekman. Simple program with straightforward documentation. Eighty-column printing with the IIe. Silicon Valley Systems, 1625 El Camino Real, #4, Belmont, CA 94002. $199. *11/82.*

Word Juggler IIe. Gill. Sophisticated word processor with search, replace, and block move. Printout can be viewed on screen prior to printing; prints multiple copies of selected pages. Now includes *Lexicheck,* a fifty-thousand-word spelling checker. Quark, 2525 W. Evans Ave., #220, Denver, CO 80219. $189. *10/83.*

Word Processing. Comprehensive, complex attempt to bridge gap between microcomputer packages and dedicated word processors. Intended for sophisticated users. Good, but rough around the edges. State of the Art, 3183-A Airway Ave., Costa Mesa, CA 92626. $395. *3/84.*

WordStar. Screen-oriented, integrated word processing system in CP/M. Z-80. MicroPro, 33 San Pablo Ave., San Rafael, CA 94903. $495.

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Apple Business Basic. High-level structured programming language. Apple, 20525 Mariani Ave., Cupertino, CA 95014. $125.

Apple Speller III. Sensible Software. Spell-checking program based on the Random House Dictionary recognizes 81,400 words including geographic terms, names, abbreviations, figures. Gives word counts, word incidence; works with most Apple III word processors. Directly accessible from *Apple Writer III*, version 2.0. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. $175.

Apple III Business Graphics. BPS. General-purpose graphics program draws line graphs, bar graphs in three formats, overlays, and pie charts in 16 colors. Continuous or discrete data; curve-fitting capabilities. Apple, 20525 Mariani Ave., Cupertino, CA 95014. $175.

Apple III Pascal. Program preparer with editor, compiler, disassembler, linker, filer, system library. Features cursor control, text modeling, formatting. Apple, 20525 Mariani Ave., Cupertino, CA 95014. $250.

Apple Writer III. Lutus. Uses WPL (word processing language) to automate text manipulation and document creation. Adjusts print format during printing; translates from typewriter shorthand to English or other language and back again. Apple, 20525 Mariani Ave., Cupertino, CA 95014. $225.

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Catalyst. Allows boot from hard disk; transfers all programs to ProFile. Quark, 2525 W. Evans Ave., #220, Denver, CO 80219. $149.

Data Capture III. Moves data among mainframes, micros, bulletin boards. Off-line editing, menu-driven, copyable. Southeastern, 7743 Briarwood Dr., New Orleans, LA 70128. $90.

Hardisk Accounting Series, 2.0. General ledger, accounts receivable, and accounts payable handle 32,776 customers or accounts; inventory features five methods of evaluation. Also payroll, management analysis, and mailing labels. Great Plains, 1701 S.W. 38th St., Fargo, ND 58102. $395 to $595 per module.

Inkwell. Wunderlich. Word processor prints documents as they appear on-screen, simulates typewriter or creates form letters from mailing list. Horizontal scrolling allows text up to 155 characters wide. Foxware Products, 2506 W. Midwest Dr., Taylorsville, UT 84118. $185.

Keystroke. Handles large amounts of data. Can hold up to 32,000 records on hard disk and provide instant access. User-definable keys. Access two files at once or join two files. Report generator saves up to eight report formats. Easily merges with *VisiCalc*, *Apple Writer*, and *Word Juggler*. Brock, Box 799, 8603 Pyott Rd., Crystal Lake, IL 60014. Database, $249. Report generator, $149.

Lexicheck. Spelling checker that runs from inside *Word Juggler*. Fifty-thousand-word dictionary; add your own words. Eight-thousand-word legal dictionary disk also available. Quark, 2525 W. Evans Ave., #220, Denver, CO 80219. $145.

Mail List Manager. Generates, stores, sorts, edits, and prints mailing list files. Apple, 20525 Mariani Ave., Cupertino, CA 95014. $150.

Micro/Terminal. Gives access to any in-house or remote database; set up and log only once. Built-in editor or edit off-line. Microcom, 1400-A Providence Hwy., Norwood, MA 02062. $99.95.

PFS:File. Page. Form-oriented information-management system stores and retrieves up to 32,000 entries. Software Publishing, 1901 Landings Dr., Mountain View, CA 94043. $175.

PFS:Graph. Chin, Hill. Works alone or interfaces with PFS databases and *VisiCalc* files. Produces bar, line, and pie charts, merging data from several sources. Software Publishing, 1901 Landings Dr., Mountain View, CA 94043. $175.

PFS:Report. Page. Generates reports; sorts, calculates, and manipulates data filed with *PFS:File*. Software Publishing, 1901 Landings Dr., Mountain View, CA 94043. $125.

Quick File III. Personal index card or filing system that generates reports, sorts. Fifteen fields; file as long as disk allows; can be put on ProFile. Apple, 20525 Mariani Ave., Cupertino, CA 95014. $100.

Senior Analyst III. Business Solutions. Financial spreadsheet develops models for budgets, planning, profit and loss reports, cash flow projections, and forecasts. Protects model from changes in anything but a value. Links pages easily. Apple, 20525 Mariani Ave., Cupertino, CA 95014. $350. *4/83.*

State of the Art General Ledger and Business Modules. Standalone interfaceable modules for 12 accounting periods. *General Ledger* can handle 470 accounts, 100 transactions before updating files. Modules for budget and financial reporting, accounts receivable/payable, inventory control, sales invoicing, payroll, professional time and billing. State of the Art, 3183A Airway Ave., Costa Mesa, CA 92626. *General Ledger*, *Accounts Receivable*, *Accounts Payable*, *Payroll*, *Inventory Control*, $595; *Sales Invoicing*, *Budget and Financial Reporting*, $495; *Professional Time and Billing*, $795.

Stock Portfolio System. Tracks investments, generates reports on current portfolio status, profit and loss statements, individual security status, dividend and interest income, expenses. Stores quotes for historical recall, calculates return on investments before and after tax, provides notice of stocks going long-term, dividends coming due, options expiring. Smith Micro Software, Box 604, Sunset Beach, CA 90742. $185.

✓ **3 E-Z Pieces.** Lissner. Word processor, database, and spreadsheet—each full-size, full-featured. Holds several files on "desktop," saves report formats with file. Proportionally spaced type. A winner. Haba Systems, 15154 Stagg St., Van Nuys, CA 91405. $295. *4/84.*

VersaForm. Landau. State-of-the-art business-forms processor. Does invoicing, purchasing orders, mailing lists, client billing. Powerful, complex, worth getting to know. Hard-disk-compatible. Applied Software Technology, 14128 Capri Dr., Los Gatos, CA 95030. $495. *8/82.*

VisiCalc:Advanced Version. Bricklin, Frankston/Software Arts. For corporatewide modeling applications; develop sophisticated templates to be filled in by novice users. On-screen help, IRR and calendar functions, macro facility, variable column widths, locked cell values, and hidden cell contents. VisiCorp, 2895 Zanker Rd., San Jose, CA 95134. $400.

VisiCalc III. Software Arts, Bricklin, Frankston. Just like it sounds; expanded memory, u/lc, 80 columns. Four-way cursor movement. VisiCorp, 2895 Zanker Rd., San Jose, CA 95134. $250.

VisiSchedule. Critical path PERT scheduler. VisiCorp, 2895 Zanker Rd., San Jose, CA 95134. $300.

Word Juggler. Gill. Word processor uses expanded memory. Printout can be viewed on-screen prior to printing; prints multiple copies of selected pages. Includes *Lexicheck*, a fifty-thousand-word spell checker. Quark, 2525 W. Evans Ave., #220, Denver, CO 80219. $295. *12/82.* ∎

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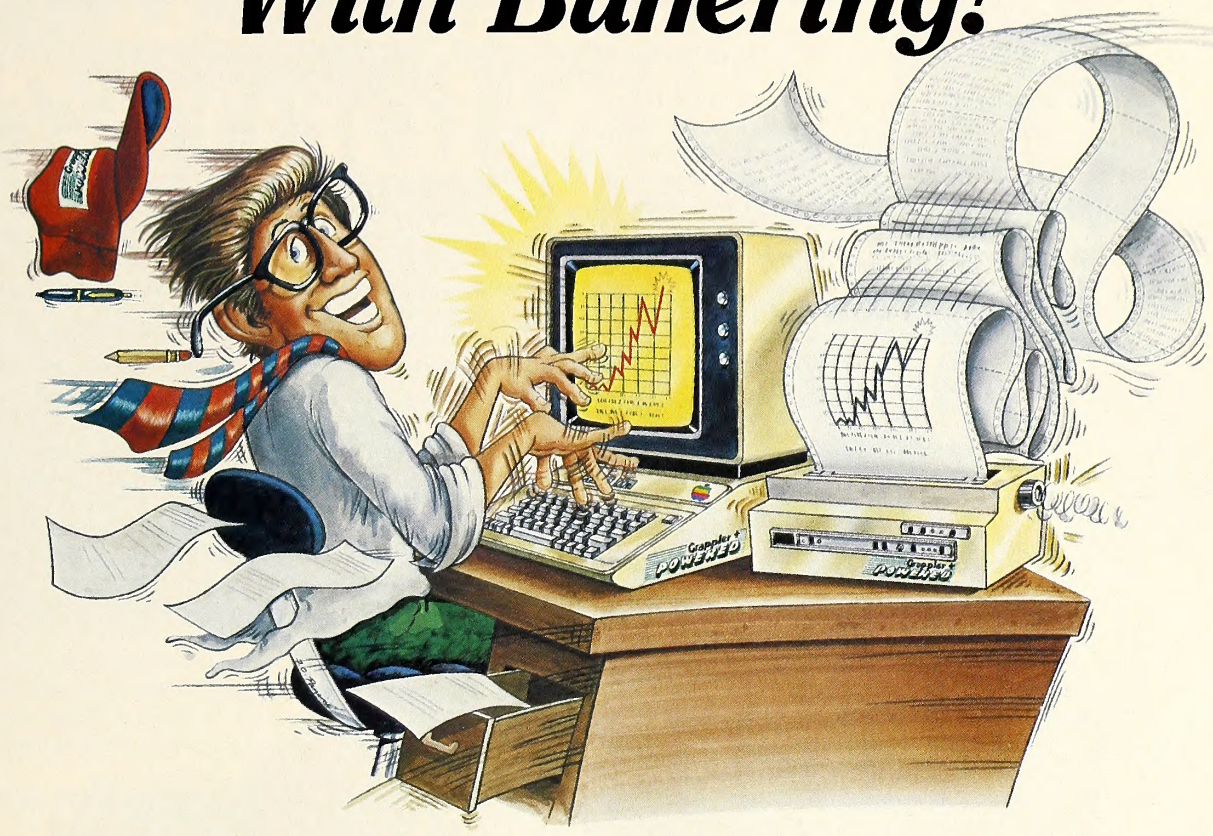

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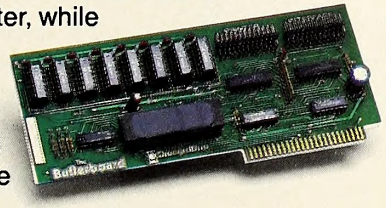

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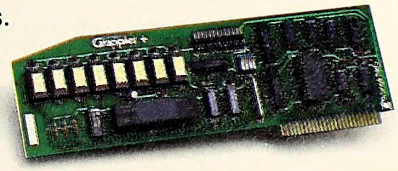

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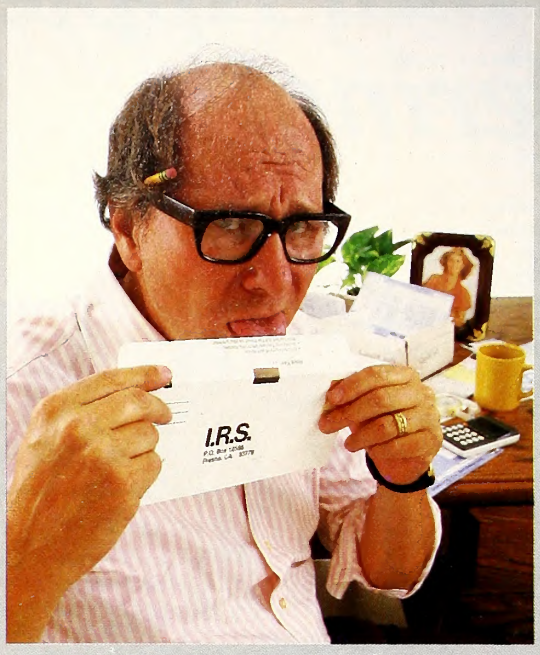

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There's Life in the Old Boy Yet

You have to be a real Apple pioneer to remember Dakin5 or Programma Software International. Both companies are now defunct. Dakin5 even managed to go defunct twice.

Yet they were once among the biggest suppliers of Apple software. Dakin5 got an award for selling $1 million worth of accounting software. And Programma had more software titles than the original Apple had chips. Now they're among the fallen.

The point is that the microcomputer industry moves so fast that yesterday's newcomers are today's leaders and tomorrow's stumblebums. A position of leadership is no guarantee whatsoever, as the industry continues to attract creative entrepreneurs and capital investment from the Fortune 500. It takes courageous, aggressive, and nimble management to stay on top of things in such a dynamic marketplace.

Because the market is so competitive, it must be a real relief to the folks at VisiCorp that they're able to paraphrase Mark Twain's classic quip that "rumors of my death have been greatly exaggerated."

The fates have not been altogether kind to the VisiFolk. As chronicled here last month, they cast off their entertainment products, only to see *Zork* become one of the bestselling pieces of software of all time. They made a crafty buyout deal with Mitch Kapor to cut their royalty costs on *VisiTrend* and *VisiPlot*, only to see sales of those products fall off while Kapor used his spoils to develop *1-2-3*, the hit software item of 1983 and 1984. Then they had a falling out with Software Arts, the developer of their flagship product, *VisiCalc*. During that struggle, *VisiCalc* lost market share in every market in which they faced competition.

Not exactly the kind of year Dan Fylstra and Terry Opdendyk had in mind.

But it's not time to consign VisiCorp to the Dakin5 and Programma graveyard yet. In March it came roaring back to reassert *VisiCalc*'s leadership among spreadsheet products in the Apple II market.

VisiCalc: Advanced Version bested *Multiplan* and placed fourteenth overall among Apple software. Vanilla *VisiCalc* placed twenty-fifth. Together they would have placed eighth. There must be life left in the old pioneer at that, because those are pretty impressive numbers to beat out of a dead horse.

From an economic standpoint, VisiCorp execs must be sighing in relief that at least one of their major markets has been reestablished. But even as they strive to solidify their Apple II standing, they're facing a new challenge on the significantly smaller Apple III front.

VisiCalc: Advanced Version has been alone in the Apple III for months. The product was really tailored for machines like the Apple III with lots of memory and has provided the primary raison d'être for the machine. But it's in this unlikely arena that the next challenge has come forth. It's called *III E-Z Pieces*.

Haba, publisher of *III E-Z Pieces*, doesn't even sell against *VisiCalc*. Their demo is aimed at wooing those enamored with *1-2-3* back into the

Apple III

This Month	Last Month	
1.	2.	**Apple Writer III**, Paul Lutus, Apple Computer
2.	1.	**Catalyst**, Tim Gill, Quark
	—	**III E-Z Pieces**, Rupert Lissner, Haba Systems
	5.	**VisiCalc: Advanced Version**, Software Arts/Dan Bricklin and Robert Frankston, VisiCorp
5.	2.	**Quick File III**, Rupert Lissner, Apple Computer
6.	—	**Payroll III**, State of the Art
	—	**Accounts Receivable III**, State of the Art
8.	10.	**General Ledger III**, George Shackelford, State of the Art
9.	—	**Word Processor**, State of the Art
	—	**General Ledger**, BPI/John Moss and Ken Debower, Apple Computer

Arcade 10

This Month	Last Month	
1.	1.	**Lode Runner**, Doug Smith, Broderbund Software
2.	3.	**Zaxxon**, John Garcia, Datasoft
3.	5.	**Choplifter**, Dan Gorlin, Broderbund Software
4.	2.	**Julius Erving and Larry Bird Go One-on-One**, Eric Hammond, Julius Erving, and Larry Bird, Electronic Arts
5.	6.	**Miner 2049er**, Mike Livesay and Bill Hogue, Micro Fun
6.	—	**Frogger**, Olaf Lubeck, Sierra On-Line
7.	—	**Centipede**, Atarisoft
8.	9.	**Spare Change**, Dan and Mike Zeller, Broderbund Software
9.	4.	**Pinball Construction Set**, Bill Budge, Electronic Arts
10.	7.	**Hard Hat Mack**, Michael Abbot and Matthew Alexander, Electronic Arts

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Apple camp. *Pieces* is the first solid attempt at integrated software in the Apple eight-bit world in that it combines spreadsheet, database, and word processing functions.

It won't be easy for anyone to shrug off a challenge from this competitor. The author is Rupert Lissner. When previously spotted, he was busy writing a thing called *Quick File IIe*. That one has been the hottest new business program in both Apple markets since its release. Now he's got a new entry, and it seems to be taking off as well.

Apple II owners will get a chance to sample Lissner's magic as well. Essentially the same product is being released by Apple for the II. It's called *AppleWorks* and previewers are giving the product raves.

For VisiCorp, the big question is whether Apple owners will view Lissner's latest efforts as truly integrated software packages that will supplement a software library or whether they'll focus on the spreadsheet capability. That's the salient point.

In the IBM Personal Computer market, nobody except Mitch Kapor and a couple of stockbrokers making a market in Lotus Development stock really consider the product as a piece of integrated software. Everyone buys it because of its outstanding spreadsheet performance.

Word Processors 10

This Month	Last Month	
1.	1.	**Apple Writer IIe**, Paul Lutus, Apple Computer
2.	2.	**PFS:Write**, Sam Edwards, Brad Crain, and Ed Mitchell, Software Publishing Corporation
3.	3.	**Bank Street Writer**, Gene Kuzmiak and the Bank Street College of Education, Broderbund Software
4.	4.	**HomeWord**, Ken Williams and Jeff Stephenson, Sierra On-Line
5.	5.	**Word Juggler IIe**, Tim Gill, Quark
6.	6.	**Sensible Speller**, Charles Hartley, Sensible Software
7.	10.	**Apple Writer II Pre-Boot Disk**, Kevin Armstrong and Mark Borgerson, Videx
8.	8.	**Word Handler**, Leonard Elekman/Silcon Valley Systems, Advanced Logic Systems
9.	7.	**WordStar**, MicroPro
10.	9.	**Format-II**, G.K. Beckmann and M.A.R. Hardwick, Kensington Software

Home Education 10

This Month	Last Month	
1.	1.	**MasterType**, Bruce Zweig, Scarborough Systems
2.	3.	**Typing Tutor**, Dick Ainsworth, Al Baker, and Image Producers, Microsoft
3.	2.	**Apple Logo**, Logo Computer Systems, Apple Computer
4.	—	**Math Blaster**, Janice Davidson and Richard Eckert, Davidson and Associates
5.	4.	**Early Games for Young Children**, John Paulson, Counterpoint Software
6.	—	**Meteor Multiplication**, Jerry Chaffin, Bill Maxwell, and Barbara Thompson, Developmental Learning Materials
7.	5.	**Computer SAT**, Harcourt Brace Jovanovich
8.	—	**Algebra 1**, EduWare, MSA
9.	—	**Early Games: Piece of Cake**, Bob Eyestone, Counterpoint Software
10.	—	**Alligator Mix**, Jerry Chaffin, Bill Maxwell, and Barbara Thompson, Developmental Learning Materials

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Early Games feature multiple activities, easy to use picture menus, and colorful graphics. The games are fun, children love to play them! That's why they learn from them.

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The database, memo writing, and graphing capabilities are incidental.

If Apple owners decide these new packages are essentially gussied-up spreadsheets, *VisiCalc* may take another buffeting. But if the market consensus is that they're general-purpose software packages, most expert users will also buy specific spreadsheet, database, and word processing software for performance. Then *VisiCalc* will be impacted less.

In general, the best news for software developers came out of the educational area, where one aggressive entrepreneur and another well-capitalized, long-established educational materials developer both made their mark.

Biggest noise was made by *Math Blaster*, a product of Davidson and Associates. You won't find that company in *Fortune*'s latest listing of the five hundred largest industrial companies. Nor will you see the name in neon lights above some skyscraper. What Davidson and Associates represents is a small, tightly knit group of educators who have a solid understanding of educational values and of motivating children.

That understanding translated into the twenty-sixth bestselling program in all of Appledom as well as the fourth bestselling educational product.

Another relatively small newcomer that scored well in the educational market was Counterpoint Software. They've had success with *Early Games for Young Children* in both the Apple and IBM markets. This month they had a double Apple hit, with *Early Games: Piece of Cake*

Adventure 5

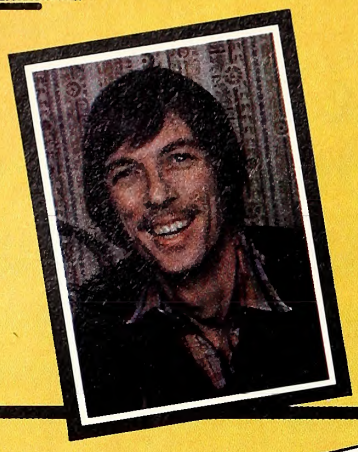
This Month	Last Month	
1.	1.	**Zork I**, Infocom
2.	5.	**Deadline**, Infocom
3.	2.	**Zork II**, Infocom
4.	3.	**Zork III**, Infocom
5.	—	**Death in the Caribbean**, Philip and Bob Hess, Micro Fun

Strategy 5

This Month	Last Month	
1.	1.	**Flight Simulator II**, Bruce Artwick, SubLogic
2.	2.	**Sargon III**, Dan and Kathe Spracklen, Hayden
3.	3.	**Castle Wolfenstein**, Silas Warner, Muse
4.	4.	**Millionaire**, Jim Zuber, Blue Chip Software
5.	—	**Bermuda Race**, John Biddle and Gordon Mattox, Howard W. Sams and Company

Fantasy 5

This Month	Last Month	
1.	1.	**Wizardry**, Andrew Greenberg and Robert Woodhead, Sir-tech
2.	3.	**Legacy of Llylgamyn**, Andrew Greenberg and Robert Woodhead, Sir-tech
3.	2.	**Exodus: Ultima III**, Lord British, Origin Systems
4.	5.	**Ultima II**, Lord British, Sierra On-Line
5.	4.	**Knight of Diamonds**, Andrew Greenberg and Robert Woodhead, Sir-tech



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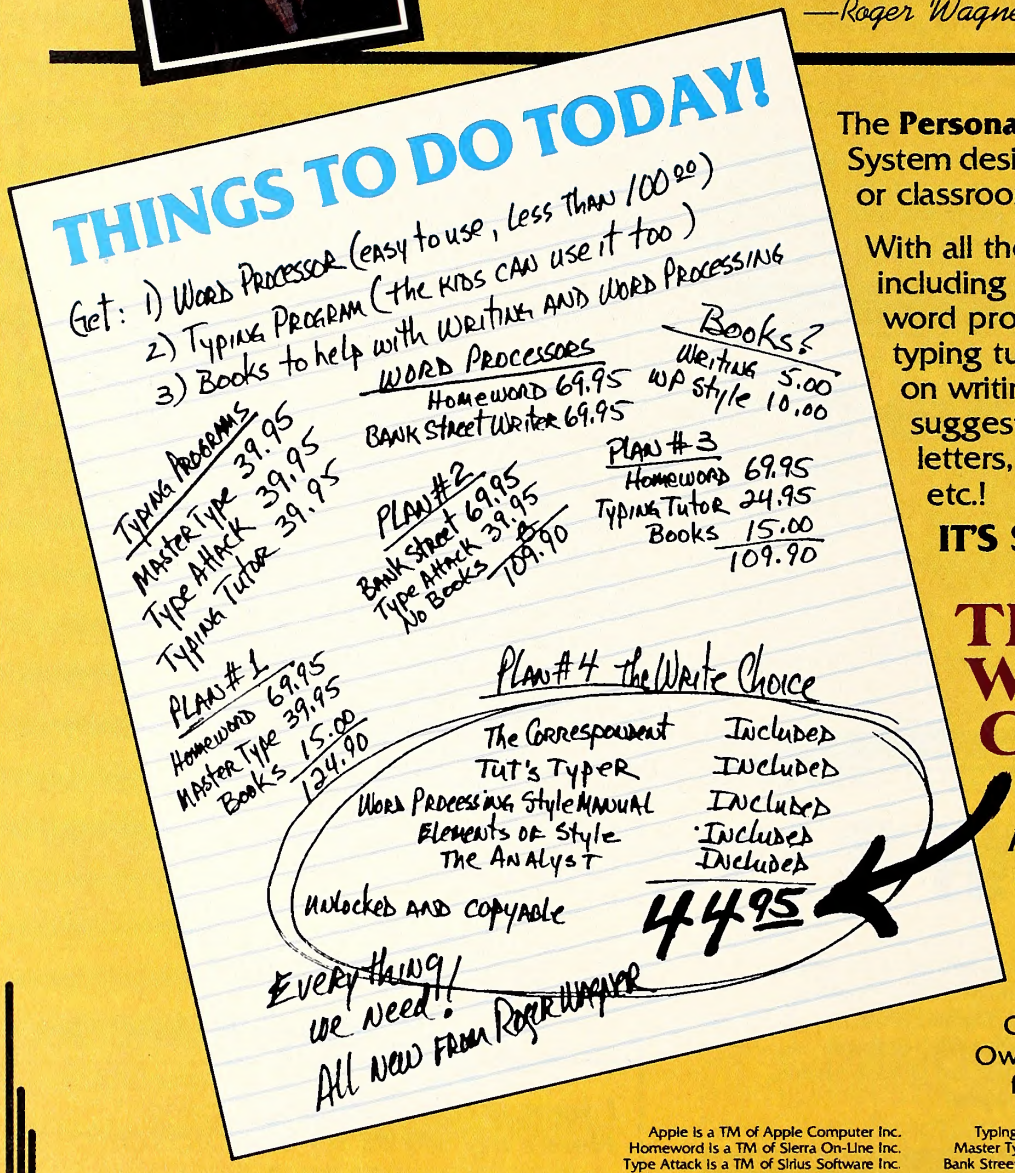

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joining the hit parade in ninth place.

From the other side of the fence came Developmental Learning Materials, a Texas company with a long history of sound educational products before it branched into software. For months, its products have been significant sellers without breaking into the Education 10. March

Business 10

This Month	Last Month	
1.	1.	**PFS:File**, John Page and D.D. Roberts, Software Publishing Corporation
2.	2.	**Quick File IIe**, Rupert Lissner, Apple Computer
3.	4.	**PFS:Report**, John Page, Software Publishing Corporation
4.	7.	**VisiCalc: Advanced Version**, Software Arts/Dan Bricklin and Robert Frankston, VisiCorp
5.	3.	**Multiplan**, Microsoft
6.	6.	**VisiCalc**, Software Arts/Dan Bricklin and Robert Frankston, VisiCorp
7.	8.	**BPI General Accounting**, John Moss and Ken Debower, Apple Computer
8.	—	**BPI General Ledger**, John Moss and Ken Debower, Apple Computer
9.	5.	**PFS:Graph**, Bessie Chin and Stephen Hill, Software Publishing Corporation
10.	9.	**General Ledger**, George Shackelford, State of the Art

Hobby 10

This Month	Last Month	
1.	2.	**Zoom Grafix**, Dav Holle, Phoenix Software
2.	6.	**Silicon Salad**, Bert Kersey and Mark Simonsen, Beagle Bros
3.	—	**DOS Users Kit**, The Professor
4.	—	**Fontrix**, Steve Boker and Duke Houston, Data Transforms
5.	1.	**Global Program Line Editor**, Neil Konzen, Beagle Bros
	4.	**DiskQuik**, Harry Bruce and Gene Hite, Beagle Bros
7.	3.	**Pronto DOS**, Tom Weishaar, Beagle Bros
8.	9.	**Beagle Basic**, Mark Simonsen, Beagle Bros
	5.	**DOS Boss**, Bert Kersey and Jack Cassidy, Beagle Bros
	10.	**Apple Mechanic**, Bert Kersey, Beagle Bros

Home 10

This Month	Last Month	
1.	1.	**Home Accountant**, Bob Schoenburg, Larry Grodin, and Steve Pollack, Continental Software
2.	2.	**Dollars and Sense**, Frank E. Mullin, Monogram
3.	4.	**Tax Advantage**, Henry Hilton and Harry Coons, Continental Software
4.	3.	**Music Construction Set**, Will Harvey, Electronic Arts
5.	10.	**Data Capture 4.0**, George McClellan and David Hughes, Southeastern Software
6.	4.	**ASCII Express: The Professional**, Bill Blue and Mark Robbins, United Software Industries
7.	7.	**Tax Preparer**, James Howard, HowardSoft
8.	6.	**Micro Cookbook**, Brian E. Skiba, Virtual Combinatics
9.	9.	**Crossword Magic**, Steve and Larry Sherman, L&S Computerware
10.	—	**Tax Manager**, TASO, Micro Lab

Softalk Presents The Bestsellers

changed all that as *Meteor Multiplication* scored sixth and *Alligator Mix* landed the tenth position.

The educational marketplace is becoming a challenging meeting ground for the computer entrepreneurs to test their strength against old-line companies. In addition to DLM, Weekly Reader with its Stickybear series, Reston with *Multiploy*, Control Data with the Plato series, IBM's SRA subsidiary, Children's Television Workshop, and Harcourt Brace Jovanovich with *Computer SAT* are active competitors. Among the smaller software houses are such relative newcomers as EduWare, Spinnaker, The Learning Company, Davidson and Associates, Counterpoint, and Advanced Ideas. Right now there seems to be room for everyone, but if a software shakeout comes, how it affects these companies will be fascinating.

In the Apple III market, State of the Art accounting packages eclipsed Great Plains Software entries, reversing a several-month trend.

The Word Processing 10 had an identical list with minor shuffling of placement.

The biggest news other than *VisiCalc*'s renewed competitiveness in the Business 10 was the placement of two BPI packages, *General Ledger* and *General Accounting*, on the list. State of the Art's *General Ledger* was also a strong entry.

The Hobby 10 got a couple of new entrants and a new leader. Phoenix's *Zoom Grafix* regained the number-one slot while newcomers *DOS Users Kit* and *Fontrix* were rated third and fourth respectively. This was a decided upset in that there remained only seven positions for Beagle Bros to fill. *Silicon Salad* was their lead entry in March, placing second. It's the first time in some months that Beagle Bros hasn't placed eight or more programs in the Hobby 10.

The Home 10 continues to reflect the seasonal interest in tax preparation and planning packages. *Tax Advantage* from Continental moved up to third place and *Tax Preparer* from HowardSoft maintained seventh. Moving into the tenth slot was *Tax Manager* from Micro Lab.

Lode Runner and *Zaxxon* remained one-two among arcade games. *Frogger* made a resurgence to sixth and Atarisoft's *Centipede* made seventh; Atari's software strategy continues to show success in capitalizing on their rights to popular coin-op games by translating them onto several computers.

Infocom lost their death grip on the adventure market. They got the first four places in March, but Micro Lab's *Death in the Caribbean* grabbed fifth, nosing out Infocom's *Enchanter*. Last month, Infocom made a clean sweep of the category.

The Wizardry epochs and the Ultima series juggled positions some, but they kept a tight hold on all five positions in the Fantasy 5.

Interest in strategy games was light in March. The first four positions remained stable, but sales were down relative to other software genres. The newcomer was actually a several-month-old program, *Bermuda Race*. ART

Apple-franchised retail stores representing approximately 5.27 percent of all sales of Apple and Apple-related products volunteered to participate in the poll.

Respondents were contacted early in April to ascertain their sales for the month of March.

The only criterion for inclusion on the list was the number of units sold—such other criteria as quality of product, profitability to the computer store, and personal preferences of the individual respondents were not considered.

Respondents in April represented every geographical area of the continental United States.

Results of the responses were tabulated using a formula that resulted in the index number to the left of the program name in the Top Thirty listing. The index number is an arbitrary measure of the relative strength of the programs listed. Index numbers are correlative only to the month in which they are printed; readers cannot assume that an index rating of 50 in one month represents equivalent sales to an index rating of 50 in another month.

Probability of statistical error is plus or minus 2.34 percent, which translates roughly into the theoretical possibility of a change of 2.67 points, plus or minus, in any index number.

The Top Thirty

This Month	Last Month	Index	
1.	1.	176.36	**Apple Writer IIe**, Paul Lutus, Apple Computer
2.	3.	98.77	**MasterType**, Bruce Zweig, Scarborough Systems
3.	10.	92.85	**Home Accountant**, Bob Schoenburg, Larry Grodin, and Steve Pollack, Continental Software
4.	4.	88.80	**PFS:File**, John Page and D.D. Roberts, Software Publishing Corporation
5.	7.	84.44	**PFS:Write**, Sam Edwards, Brad Crain, and Ed Mitchell, Software Publishing Corporation
6.	2.	73.84	**Flight Simulator II**, Bruce Artwick, SubLogic
7.	9.	66.37	**Bank Street Writer**, Gene Kuzmiak and the Bank Street College of Education, Broderbund Software
8.	8.	64.50	**Quick File IIe**, Rupert Lissner, Apple Computer
9.	5.	56.71	**Lode Runner**, Doug Smith, Broderbund Software
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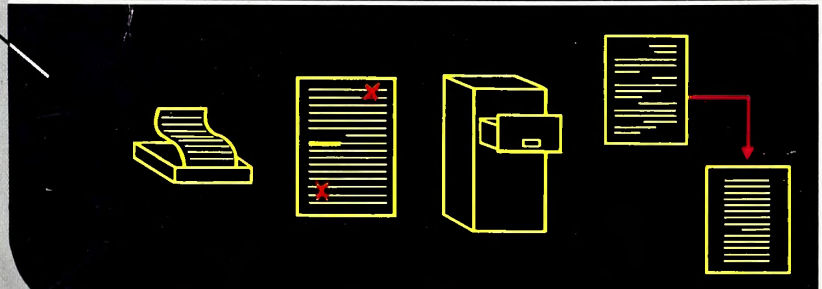

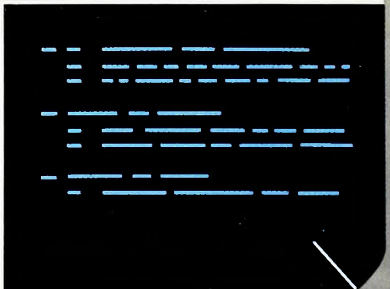

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