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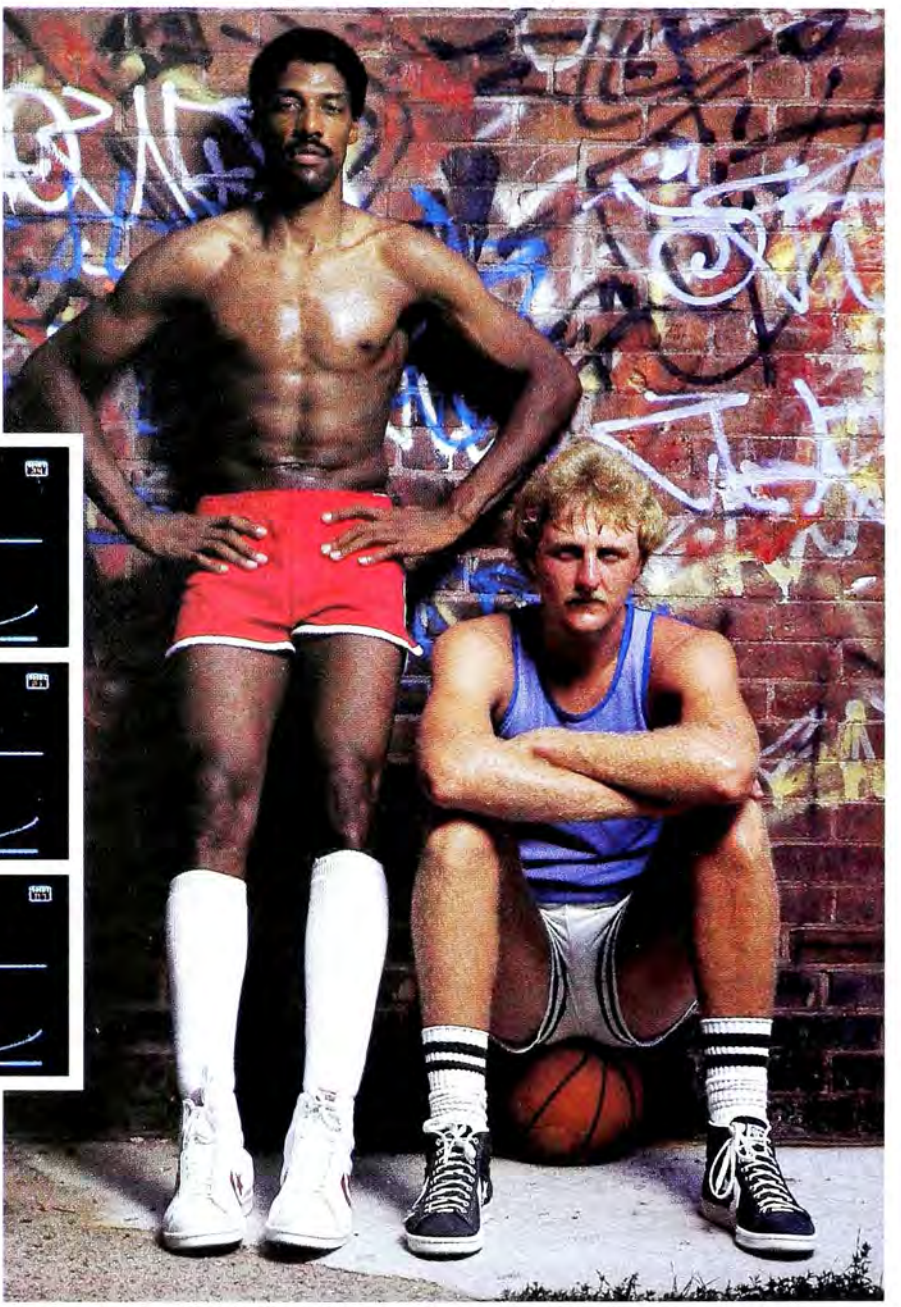


It wasn't easy. When they talked, we listened. When they criticized, we made big changes. When they gave suggestions, we took them.

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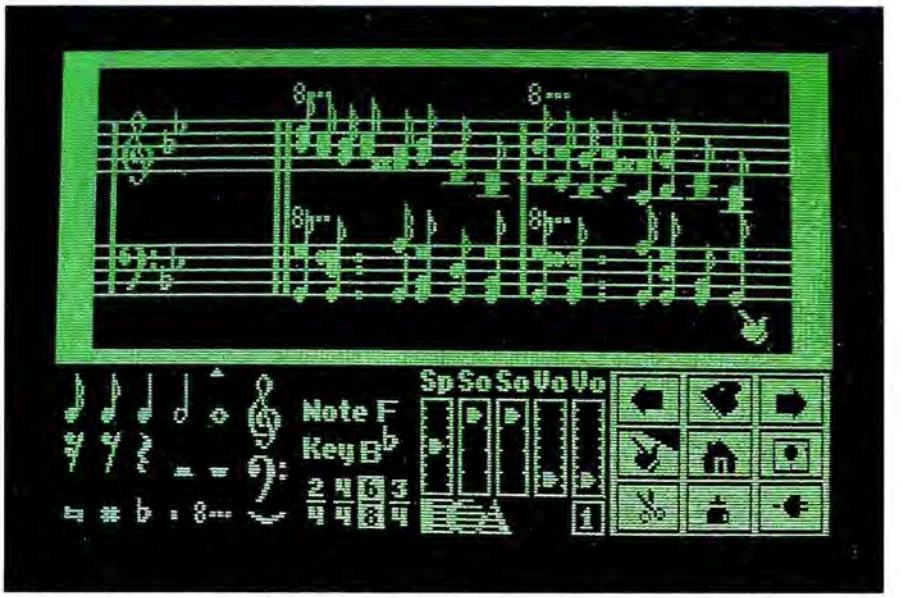


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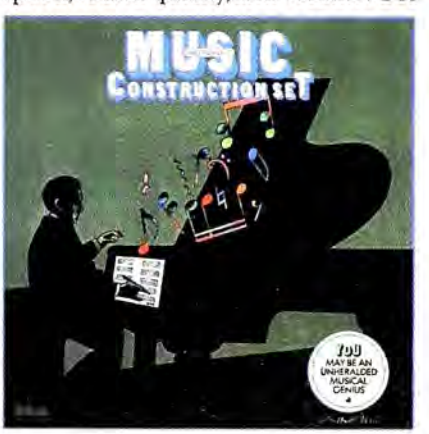
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SOFTALK

APRIL 1984

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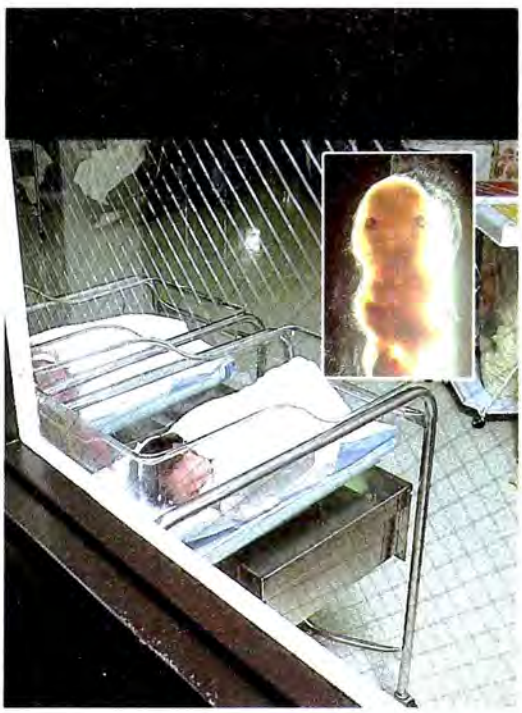
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On Our Cover: Despite all mankind's progress, the birthing process still has its pitfalls, and Apples are helping out. Inset photo: Human fetus at two months. Photos by Bob Williams of Valley Presbyterian Hospital.

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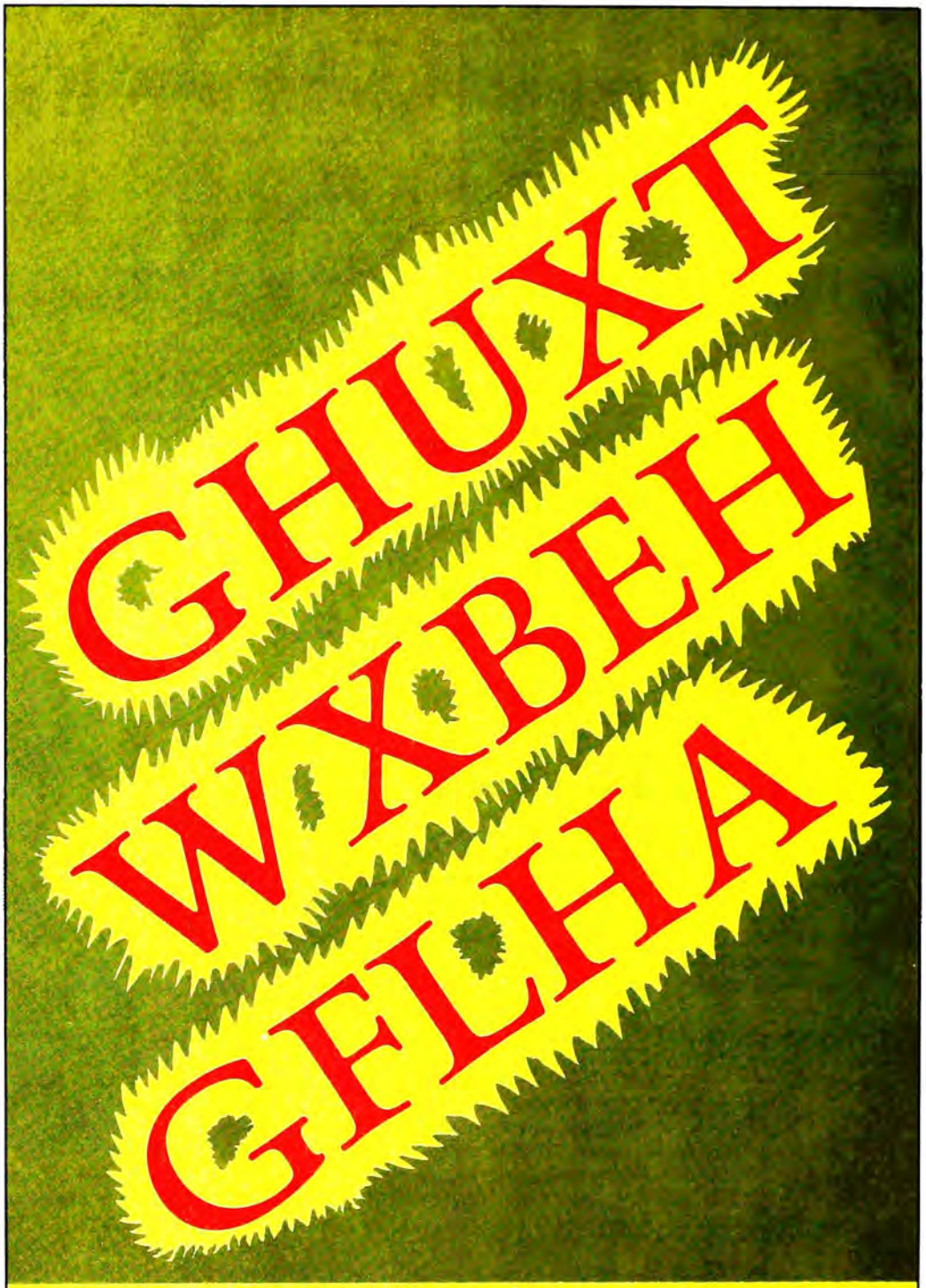
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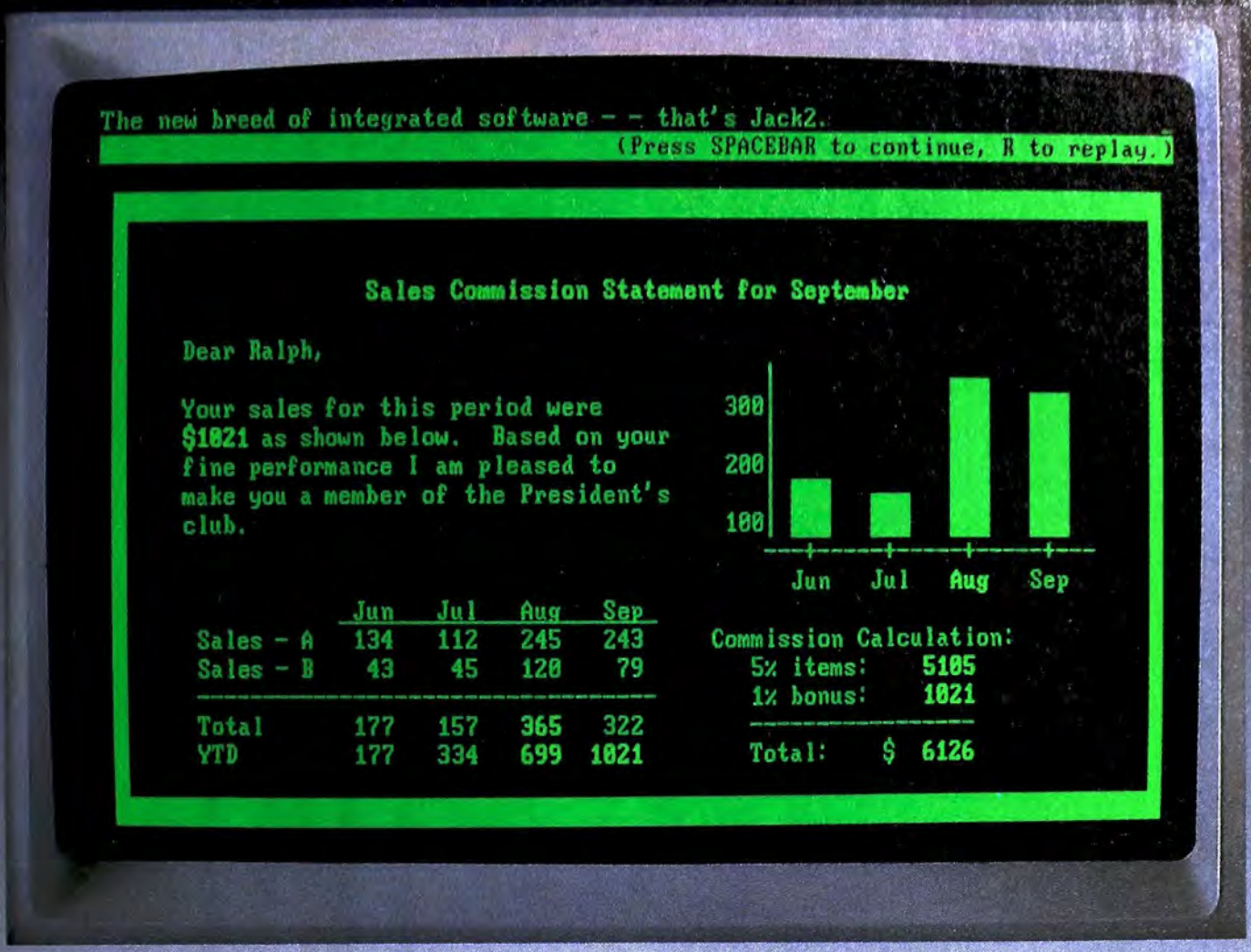
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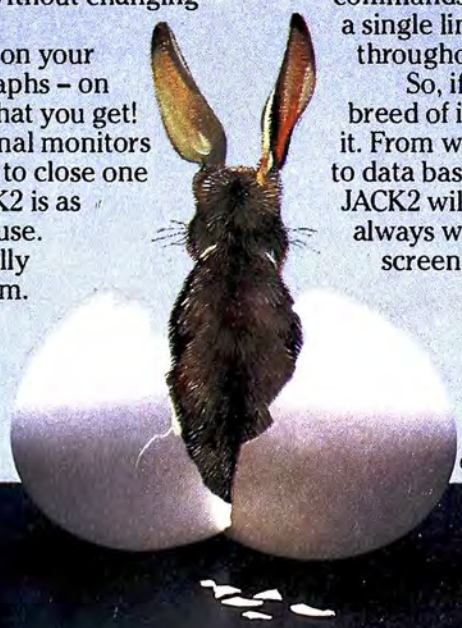
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Contest Winners: Oracle: A Cold Start; A Washed-Up Adventurer

Thanks to intersibling rivalry, Matthew Eaton (Valencia, CA) is the first winner in the Oracle '84 contest. A bit of explanation is in order.

Mom Always Did Like You Best. On the final day of Olympic competition, Alpine skier Phil Mahre zipped down the slalom course with a time fast enough to win the gold medal for the event. But the event was not over. Right after his winning run, Mahre headed straight for a walkie-talkie, apparently to radio information up the mountain to Steve Mahre, his brother, who had yet to make his run.

Unreliable sources say that the Mahres had entered the *Softalk* Oracle contest and were trying to assure themselves a win. The source said each brother had predicted that four medals would be won in Alpine skiing. Phil's gold medal was the fourth; if Steve came down the hill fast enough to win another medal, they would lose the contest. A tape recording of their conversation was sent anonymously to the contest staff:

Phil: I think I got it, Steve. Wipe out on the fifth turn. Let that French guy have the medal.

Steve: Didier? That jerk!? Listen, we can get $200 of stuff for the Apple by cashing in on product endorsements if I get the silver. I'm going for it.

Phil: Don't do it! Look, if we win, I'll get *Lode Runner*, and you can get *3-D Skiing* and *Stickybear Bop*. We'll have enough left over for an eighty-column card.

Steve: No dice. You just want to show Mom a gold medal while I come home empty-handed. Besides, I changed my mind; I'm getting a Macintosh when we get home.

Phil: Wimp!

Steve: Techie!

Phil: User!

Steve: *censored*!

True Olympians.

Well, Steve valued an Olympic medal more than $200 worth of Apple goods. He won a silver.

That fifth medal qualified a select few Oracle contestants for the random number round. In the end, Eaton was the winner. (Sing National Anthem here.)

Eaton plans to blow the cash on part of a Hayes Micromodem IIe (paying for the rest himself), which he'll pick up at his computer accessories dealer, Softpatter, also in Valencia. Despite his early victory, Eaton admits he doesn't have high hopes to win the Macintosh computer in the end. We agree; his prediction for the presidential election is a guy named Edward Kennedy, and his Best Actor prediction is Clint Eastwood. Nonetheless, congratulations are in order; he's won $200 more than anyone else in this contest so far.

For Those Keeping Score at Home. Here's how the scoring went. Everyone began with a score of zero. All contestants who didn't predict that the United States would win five medals in any one sport lost one point for each medal difference between five and their predictions (example: predictions of three, four, six, and ten would lose two, one, one, and five points respectively).

The next part was the bonus. The five medals were won in Alpine skiing, which includes slalom, downhill, and giant slalom. The U.S. won two in women's giant slalom, two in men's slalom, and one in men's downhill, for a total of five. (Other medals: one each in men's figure skating, women's figure skating, and pairs figure skating.)

Some contestants carelessly wrote events (figure skating, downhill skiing) as their predictions, rather than the whole sport. Sorry, gang.

Other, more careless people predicted sports such as swimming, gymnastics, track and field, and shooting. You know—Summer Olympic sports. Oh, well. No points for trying.

As it stands, those who predicted five as the number of medals and Alpine skiing as the sport are in a tie for first place, with a whopping grand total of . . . five points. They are, in order of how fast their entries can be found, Charles Lewis and Elizabeth Lewis (Richmond, VA), Robert Miller (Baltimore, MD), Rob Szczerba (Penfield, NY), Russell Willis (Glasford, IL), Mark Jerkatis (Orland Park, IL), Daniel Drawbaugh (Camp Hill, PA), and the winner of last year's Oracle contest, Paul Shanberg (Moraga, CA).

Suds in Space. Yes, the adventure contest could have been a lot harder, as the mounds and mounds of correct entries indicate. Next time we run a similar contest, we promise not to underestimate everyone's intelligence.

Most of the entries correctly pointed out that our adventurer was doing the laundry in an apartment building (not a Laundromat!). From the heap of correct entries, fourteen-year-old Robert Tigner (Toledo, OH) was picked as the winner. Like Eaton, Tigner also committed his contest winnings to purchase a modem; he's getting the Networker by Zoom Telephonics. Good job!

Tigner ground his brain for four days before arriving at the answer (he called it "strenuous thought"; his teachers called it "wasting time in class"). As an aside, Tigner would like to know how to produce the cents sign on *Apple Writer*. Maybe he should have spent his winnings on a typewriter?

As for the $50 bonus prize for the most interesting, mind-stimulating, and imaginative description, that will have to wait until next month. So far, most of the entries look good; it's going to be hard to pick just one winner. Keep your eyes glued to these pages for announcements.

In the meantime, here's the real description of what was going on:

The adventurer started in a room with aluminum artifacts (kitchen with pots and pans; it was interesting how many people said they were beer cans!). The room with ceramic bowls was the bathroom. Kaolin, feldspar, and quartz are what porcelain is made of; the porcelain bowls were the sink and toilet (it said, "You have no need for the bowls. . . . yet." Obviously, you're going to need the sink or toilet one of these days).

The container was made of organic compounds (plastic) and contained objects "composed of the Linaceae family of plants." Linaceae is what flax (not cotton) comes from, which is used in making linen. Crystals in the bottle were laundry detergent; syrupy liquid was fabric softener. The shaky room was the elevator (our adventurer accidentally pushed the wrong button the first time).

Most contestants assumed too much. The disks were coins, but not necessarily quarters and dimes, as most people wrote. The inscription referring to ancient religions was "In God We Trust." Compartments with top hatches and front hatches were washers and dryers.

From that point on it was just a matter of moving the linens from washer to dryer and carrying them back upstairs, where the adventurer had some liquid refreshment. This time half the contestants opened a beer, while the other half had a grape Nehi. Q.E.D. ■

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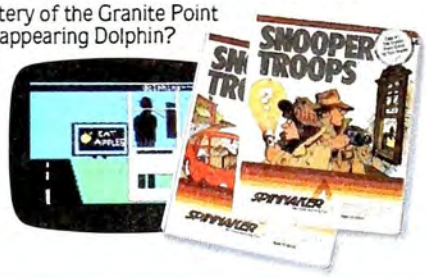
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Eric

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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.*

Blood on the Tracks

I am writing to you to let you know about an incident that Apple owners and physicians might find interesting. I now do patient charting on Apple computers in each examining room. The system is quite sophisticated and incorporates a Corvus hard disk and multiuser access; however, this is not specifically what I am writing about.

I have an Apple in my home that is hooked up to a data retrieval and data management file system (Scimate). One night the hospital called me at about midnight and said a patient of mine was bleeding in the intensive care unit. The patient had postsurgical bleeding problems that, according to the current literature, were not readily manageable. The patient was given the usual blood products to try to stop the bleeding, but this was not successful.

That night I searched through Dialog and Medline. I searched the literature regarding my patient's particular bleeding diathesis and was able to download nineteen different abstracts. From the German literature (the abstract was in English), an article appeared describing a new bleeding problem in patients with the diathesis that my patient had. I immediately called the intensive care unit and, based on the abstract of the German article, I started the patient on a blood replacement product (cryoprecipitate) that had not been used in this bleeding diathesis. In the morning while making rounds I was pleased to find that the patient had stopped bleeding.

Situations like this clearly show that the computer age is here to stay. I firmly believe that, by leading me to a therapeutic trial that would not have otherwise been rendered, my Apple computer and data retrieval system contributed to saving this patient's life.

Glenn Tisman, Whittier, CA

MacTalk

Michael Crichton, in *Electronic Life*, asks why computers don't come in different colors. Your February article on Macintosh's automated assembly line made me marvel that this Model-A of the industry still seems like the Model-T when it comes to tailoring a machine to a human customer. Any color, as long as it's beige.

Most of us have had to reshape our own brain patterns to think in languages such as Pascal or assembly, which we naively imagined is what it must take to communicate with these super Cuisinarts. Mac shows that a lot of that beigethink is unnecessary. But until Mac lets us get inside and customize it ourselves some of us are going to stick to our old stick-shift Apple IIs, which after all are only human. I mean, have you ever met two that were exactly the same?

Eric Eldred, Derry, NH

MacPrices

On February 6, 1984, an article appeared in the business section of the *Chicago Tribune* that described Apple's marketing policies. One policy in effect says that consumers will support college freshmen at universities that strike deals with Apple. Their pricing in effect makes the new Macintosh computer available for $1,100, $200 below the current list price of an Apple IIe starter system.

After fifteen years of experience in data processing, I can understand Apple's eagerness to get this new system firmly entrenched in young minds. I can also understand the concept of giving a price break for educational systems. But what I fail to understand is why they would stab their dealers and customers in the back by undercutting them with such a large price break to students. What they are saying, to my mind, is that a Macintosh is not really worth $2,495 but Apple wants its customers to support Apple's gift to the future.

Well, the Macintosh may be the greatest thing since sliced bread and then again it may not. Time will tell. What I feel is a sly move may prove a poor business decision. I believe that pricing a system in this way will cheapen it.

But maybe I'm just jealous. Wouldn't it be nice to own a Rolls-Royce for the price of a Chevy?

Martin L. Boroff, Skokie, IL

MacFallout

I'm a parent of a Cal Poly San Luis Obispo engineering student; I'm an engineering manager and an Apple computer owner. The recent decision of Cal Poly to reject the Apple consortium deal for distribution of the Macintosh to qualified students and faculty members prompts me to express concern about unenlightened attitudes and missed opportunities. Stories in the local press indicate that members of the faculty felt that Apples are toys, and that Apple's designers and managers lack the maturity and stature to compete with IBM. (Apple, designed by kids and managed by a man from the Pepsi generation.)

I remember that this attitude was expressed several years ago when Apple introduced the Apple II. There were a couple of other companies with machines on the market then, and promises from several others—TI, Radio Shack, and Atari among them. The real question was whether any personal computer could establish itself as a profitable business. In only a few years Apple not only became a standard for the educational and hobby markets but also achieved the Fortune 500 list in record time. Most of the original competition is gone, some are museum pieces.

In the meantime, the sleeping giant, IBM, has finally awakened. IBM has taken a very conservative approach, relying on its name to compensate for lack of innovation. I would never underestimate the strength of IBM or its ability to throw nearly unlimited resources into any project. But where would the personal computer business be without Apple? I believe that Apple Computer has made *the* significant contribution to the personal computer era. I take Apple very seriously; its products, customer support, and continued vision demonstrate its leadership.

Will the Macintosh be a pacesetter like the Apple II was? It certainly seems possible. The Mac is an "idea machine." It is designed to have an enormous latent capacity, and its operating system is an addictive lure to the creative intellect. I am sorry and surprised to think that anyone would not take Apple's Mac seriously, least of all educators! The opportunity for students to have the Macintosh during their learning experience would enhance both their education and employment potential.

Norman J. Wood, Saratoga, CA

Coffee, Tea, or a Serial Interface?

I know that in the past several months there has been much confusion as to whether computers can or cannot be used on commercial aircraft. As of this time, the individual airlines are setting their own policies on these devices.

I would like to quote from a directive issued by the United Airlines Training Center in Denver, Colorado, on November 23, 1983, to the attention of all United Airlines flight personnel:

> Effective immediately, self-powered, typewriter-style portable computers and accessory printers and tape drives may be used by passengers in flight. Engineering has completed extensive testing of a representative cross section of these devices, and no interference to aircraft communications or navigation systems was found. . . . However, whenever interference to communications or navigation radios is encountered, the cabin should be checked for electrical devices being operated. If found, the devices should be turned off.

I hope that this helps clear up questions that readers might have on the use of their computers while on board a United airliner.

Carl A. Hankwitz, United Airlines

It's a Xerox Star

I would like to start a hot new rumor involving upcoming Apple computers. One aspect of the computer industry that has intrigued me is the selective secrecy surrounding unannounced new products. By selective secrecy, I refer to the fortunate companies and individuals who are permitted to see early versions of a new product in order to establish a software/hardware base or to test its features. These selected few usually do a fine job of keeping the big secret from the general public, but rumors do leak out from time to time.

A good number of Apple computer publications have made it known that they have previewed the new Macintosh computer, and *Softalk* is one of them. My hot new rumor stems from the advertisement in *Softalk* for the new magazine *ST.Mac*. When I first saw the ad I recognized only three of the five computer silhouettes—Apple II, Apple III, and Lisa. I now know that the bottommost silhouette is an inaccurate but reasonably close representation of the Macintosh. That leaves one shadow that I cannot identify. If *Softalk* is as much of an insider as I believe it is, then we are seeing another new Apple or a seedling from one of the four Apples that are known to exist. As far as I know no one else in the unknowing public has speculated on yet another Apple creation. Let me be the first to do so. Of course, I could be wrong about all of this, but this is how rumors begin. We shall see.

Michael Sullivan, Brooklyn, NY

While we respect your attempt to ignite the public, this is one rumor that won't fly. The mystery computer is indeed the Xerox Star. You

The Penguin Page

Author Profiles*



Author Bytes Back!

Some eight years ago budding young geologist Greg Malone was bitten by the software bug. At first it was a pleasant experience, but soon bugs in his own software began biting him, much to his chagrin. After years of wrestling with this common programmers' ailment, he decided to do something about it . . . He bit back.

The results were astounding. Suddenly the problems he had been having with his current project, a fantasy role playing game the likes of which has never been seen before, became trivial.

"I've always believed that I needed to immerse myself in a project," Greg told us, "to become one with it in a manner of speaking . . . but I never realized how simple it was! To become one with something, just eat it."

This revelation, while appropriate to software development and hamburgers, has led to some serious problems with the neighbors. "I always knew Greg liked my picket fence," says neighbor S.P. Linters, "but did he have to try to eat the whole danged thing?"

After several such run-ins with the neighbors and local authorities, Greg has decided to stick with software. He now claims to fully understand 17 compilers, 12 assemblers, 19 word processors, and 13 relational database managers. Does he have any regrets? Only one: "binary indigestion?"

*Profile is a trademark of Apple Computer, Inc.

We Tried . . .

Just over a year ago, we announced a six-month pricing experiment for all of our recreational software. While everyone else was charging $30 to $40 for their entertainment software, we decided to break the trend and offer ours at a suggested retail of $19.95 each. The strategy was that volume would make up for the difference in revenue, and frankly it was another way for us to give our customers more for their money. Anyone following reviews and seeing our software knows that it is among the best, and we really take pride in what we put into our programs. At $19.95, anyone will tell you that they were an exceptional value. Our experiment worked. Sales increased dramatically, and we continued the pricing through fall and winter.

Things change though, and now we find that we must change the pricing again. If we could support ourselves and grow on volume alone, we'd be fine. If all our costs remained proportional to our market, all would be okay. But some major things haven't. Our two largest expenses are royalties to our authors and advertising. Royalties are proportional to sales price, but advertising isn't. A year ago our average cost for a one-page advertisement was about $2000. Now it is close to $5000. Even if we doubled our sales since the first months of the lower pricing (which we've come close to doing), that still leaves us behind.

Programming is becoming more involved, too. We're investing a lot of time to create the best we can to take advantage of the computers we write for. Many of our products now fill both sides of a disk, and most of them in the future will. Much of the software in development is being written for 64K or 128K computers (including some spectacular stuff for Apples with double-resolution graphics). A programmer can fit a lot more into that kind of space. Of course it takes a lot more time. Most of the new software you'll see from us has taken well over a year of development time, with several individuals working on each. Economics for authors are changing, too.

Don't get us wrong; as a company we're in fine shape and healthy. We want to remain so. We've been living on tight margins, but we can see them getting tighter. A lot of big companies are getting into the microcomputer market now and throwing a good deal of money around (which doesn't necessarily mean they are making any). We not only have to compete with them for you, the customer; we have to compete for distribution and dealer shelf space. Good software alone doesn't always guarantee success.

We wish we could say that soon everyone would be following our lead toward lower prices. It will happen, we think, but only slowly. The purpose of this announcement is of course that we are raising the prices of our recreational software back nearer to the normal pricing. We feel we must. You will notice that it will still be among the least expensive for you, and we feel it will still be the best value for the money. Most people won't disagree.

At least we tried . . . .

Does your Dealer have Penguins?

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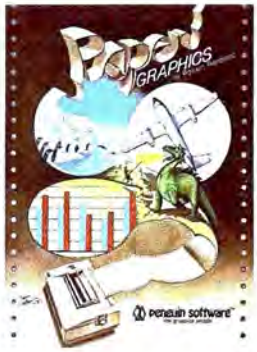
This brand-new version of our non-programmers' graphics tools includes both best-selling and highly rated products: The Complete Graphics System II and Special Effects, combined into one easy-to-use package. All the command structures have been updated so that selections are made directly by pointing 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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couldn't be expected to know that, however, because the price of the Star was, for the private user, out of this world.

Ultrasatisfied

I purchased a Starcard and *WordStar* package by MicroPro and an Ultraterm by Videx. When trying to use the Ultraterm with *WordStar* in the highlight mode I couldn't get it to work properly. I talked with a representative of Videx several times and she was most anxious to solve the problem. At one point she suggested that I talk with a representative at MicroPro, who was also extremely helpful. Both promised to work on the problem and call me back with any results. Every time they promised to call back they did, and eventually the problems were solved. I am now able to see *WordStar* in highlight/lowlight and eight columns wide by forty-eight columns deep. I highly recommend the Ultraterm and *WordStar*.

I decided I needed a daisy-wheel printer to use along with *WordStar*. I went to a store that handles the Daisy Writer 2000, but I couldn't seem to get it to do boldface with *WordStar*. The salesperson was kind enough to allow me to take the printer home for a few days to work on the problem. It seems that the Daisy Writer goes into its shadow print mode when *WordStar* tells it to do boldface. I tried different configurations and even called the local distributor, who couldn't help. I finally called Computers International and was told rather emphatically, "We don't talk to end users. Talk to the dealer or the distributor." You can be sure that my shiny new printer is not a Daisy Writer.

Robert W. Spaith, Trotwood, OH



General Approval

Your review of *The General Manager* in the November 1983 issue was right on and long overdue. I have been using this excellent program for about two years now (after comparing it with four other popular filing systems), and, except for some minor problems converting from Version 1.5 to Version 2.0, can only add to the praises offered by your reviewer.

Our corporation uses *GM* in a variety of ways. Our personnel department tracks employee relocation expenses right through the calculation of tax information and the generation of year-end tax form facsimiles for each of over one hundred employees relocated annually. Also of help in the personnel department are systems that calculate and print pension estimates and generate savings-plan statements for our employees. Our purchasing department maintains a telephone equipment inventory and tracks purchase orders, material releases, and inventory of over six hundred insurance forms.

Of course, these and other applications utilize *GM*'s ability to interface with Basic programs that access and/or update the database. Here, too, *GM* helps out with a variety of callable routines that not only save programming time but also enable the Basic program to converse with the user in virtually the same form as *GM*.

Finally, and perhaps best of all, these applications are being used by employees with no prior computer experience. All in all, a very fine product!

Joel Baumgarten, Miami, FL

Probing Synergistic

I wrote to Synergistic Software with two questions I had regarding their game *Microbe*, one of the most fascinating I have found for the Apple computer. I soon received my answers, plus an updated version of *Microbe* free because they felt that my disk might be marginally defective. I am a relatively new computer owner and I am amazed at the support received from companies like Synergistic. They are willing to answer questions and help in any way they can.

Kathleen A. Veronda, Channahon, IL

Class Maps

All too often my friends tell me, "Don't buy things out of the classified section, they're just small crooks who want your money." I'd just like to say I've had excellent personal service from Nichols Services in Columbus, Georgia. After receiving *Wizardry* maps from them, I wrote back asking a question about *Wizardry*. To my surprise I received a hand-written letter fully answering my question. I feel a personal response is rare in today's world and deserves mention. It just goes to show that the little upstart companies in the classified section aren't all bad. In fact, they can be quite good.

Marc Berg, Battle Lake, MN

Data Bytes and Disk Nibbles, the Final Word

The February Open Discussion contains a letter from David Wagner that begins, "Does Bill Basham know what he's talking about?" David misinterpreted a small mistake in my letter in the September Open Discussion and, I feel, overreacted. The misunderstanding concerns the RWTS routine in DOS. The purpose of the RWTS routine in DOS is to read or write a sector of 256 eight-bit *data bytes*. Unfortunately, you can't write these 256 data bytes directly to the disk. They must first be converted to 342 valid eight-bit *disk nibbles* and then written to the disk (a simple table look-up does the final conversion). An extra disk nibble is created at the end of the process and is called a checksum. It is important to note that this checksum is a disk nibble and not a data byte.

David objected to my saying that the checksum DOS writes at the end of a sector depends only on the last two data bytes and that you could change any of the first 340 data bytes without affecting the checksum. This cannot be correct, since there are only 256 total data bytes in a sector! I apologize for this bug in my letter.

Actually, the checksum depends only on the last data byte, and you can change any of the first 255 data bytes without affecting the checksum. To confirm this by experiment, first write a 256-byte sector of data bytes with RWTS. Then use a nibble editor to read the checksum disk nibble. Now change any of the first 255 data bytes in the sector and write it to disk again. Read the checksum disk nibble again and you'll see that it hasn't changed.

The fundamental flaw in RWTS is that it writes a checksum of the 342 disk nibbles, and this checksum is also a disk nibble. It should write a checksum of the 256 data bytes, and the checksum should be a data byte.

Here's how the checksum fails: Because of the way that RWTS translates data bytes into disk nibbles, you very frequently end up writing the disk nibble $96 onto the disk. Unfortunately, $96 has two consecutive 0 bits. Because of the way the hardware works, the second 0 bit in a row is the most likely type of bit to be read incorrectly as a 1 bit. This will most likely happen if the motor speed is too slow (for instance, during motor start-up). If this happens once, it changes the checksum and is detected. Now, if you've got 342 disk nibbles in a sector that are all $96 and you've got a marginal read situation (that is, a slow motor), there's a fairly good chance you will read that second 0 bit incorrectly two times. In other words, if conditions are right for it to happen once, it frequently will happen twice. But if it does happen twice, the second error will change the checksum back to the correct value and the error will be missed!

What does this mean in practical terms? I first discovered the problem when I tried eliminating the motor startup delay for disk reads. The catalog came up instantly and text files were read much faster on my Micro-Sci drives, which are good at reading 0 bits. With some other drives, however, I sometimes got 256 bytes of garbage in the middle of a program without a read error! Needless to say, I put the motor startup delay back in.

Writing a technical letter like this is a little like writing a program. It seems there's always a bug somewhere! This is an important generalization to keep in mind when reading a column like Open Discussion.

Bill Basham, Diversified Software Research, Rockford, IL

In case anyone still has any doubts, it has always seemed to us that Bill Basham does know what he is talking about. Which is not to say that David Wagner doesn't. The issues they are arguing about are very low-level considerations. There are very few people who can follow the ins and outs of DOS at this level.

Wagner also cast doubts on the reliability of Diversi-DOS *that we feel are unwarranted. He merely speculated about the potential for* Diversi-DOS *to crash a file; he wasn't relating actual ex-*

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perience. In our experience, Diversi-DOS *seems every bit as reliable as DOS, and readers have frequently praised Basham's support of the product.*

Rethinking Reinking

Bill Bethke's reinking procedure (January Open Discussion) is worth the annual subscription cost. Do I have to resubscribe to get the answer to his cliffhanger? He says, "I clean and lube my printer when I replace the ribbon." What does he put where? Sewing machine oil in the gizmo? White grease on the quampus? Alcohol in the estomago? Details, please!
William F. Ackerman, Aptos, CA

Reader Bill Bethke outlined his satisfactory experience with regard to reinking an Epson printer ribbon. Another little trick that he and other readers might like to know about is this: A very light spray with one of the many varieties of penetrating oil available in spray cans (such as WD40) will loosen up the ink and provide new life for a ribbon. After a light spray it is probably best to let the ribbon sit overnight before using it. This alone can double the life of a ribbon. After this trick has been used several times, it would probably then be appropriate to add more ink as described by Bill Bethke.
A. Kleider, Sioux City, IA

Graphically Packaging

I have read valid complaints in past Open Discussions about deceptive promotional graphics for software. It is my theory that this stems from the fact that the computer graphics created by programmers whose purchase of a graphics utility has led them to consider themselves artists won't bear exposure in any other medium. The quality is too poor.

The cover art of my first published software program, *Heartbeat/Heartwork/Heartflow*, is my reaction and has been developed directly from a printout of the actual screen image without alteration. Computer-graphics artists should have enough pride in their work and control of their publicity to let the public see what they are expected to buy.
Roy Alexander, Evanston, IL

Still No Software Glut

I have long been distressed by the lack of software usable in the scientific/academic community. At last there is a simple yet robust graphics program applicable for our purposes: *MasterChart*, by Spectral Graphics Software. Anyone who has fumbled with *Apple Business Graphics* will be amazed at what this little program will do at a tenth the price. Business folks and scientists alike will really appreciate how user-friendly it is; I was able to produce my first three-dimensional, multicolored, labeled bar graph within five minutes of booting the disk—without reading any documentation. I would have had to pay a scientific illustrator much more than the whole program costs just to produce that one graph. If you use bar graphs, pie diagrams, or linear plots (among many other things) in your presentations, you can't do without this gem.
John B. Iverson, Richmond, IN

In Store for Scott

If he doesn't mind a four-hour drive from Wakefield, Massachusetts, Scott McCullough (January Open Discussion) can find the computer store he's looking for. The prices are competitive; the service department is capable; the "little person" is welcome—indeed, most Saturday afternoons the place is crowded with neighborhood kids.

At least a dozen times, I have gone to these folks with problems—hardware, software, programming, the gamut—and they have been unfailingly helpful and patient with this non-corporate, non-big-spending customer.

So take heart, McCullough. I too made the rounds of all those citadels of arrogance and ignorance, savored the indirect lighting, admired the salesmen's blow-dried haircuts. I was underserved, overcharged, brushed off, turned off, and ticked off. Alas, it wasn't until after I had bought my system that I discovered my computer store. Now I know where I'll buy all those peripherals, and where I'll send friends. The store is Logical Computer Systems in Simsbury, Connecticut. They'll be around when those other clowns have long since been shaken out of their Ralph Lauren wardrobes.
C.H. Simmonds, Lakeville, CT

The Way to the Dump

In reference to Roy Freborg's question (January Open Discussion) on saving Logo pictures to disk so that they may be printed out on a graphics printer without a graphics interface card, probably the most straightforward approach is the following: First create your picture and then hide the turtle. (Remember, the turtle is in hi-res too and it will be saved with your picture if you don't hide it.) The next step is to put in a DOS 3.3 slave disk (one that has not been mastered using the System Master disk) into the disk drive connected to slot 6, drive 1 and type *.printer 6*. This boots the slave disk. When the drive light goes off, type *bsave <filename>, A$20000, L$2000*. That's all there is to it. Now the picture is saved on the disk so you may use a graphics dump program to print it.
Steven Bergerson, Virginia, MN

In response to Roy Freborg, it is now possible to save Apple Logo pictures as pictures rather than as procedures. To do so you will need the *Apple Logo Toolkit* from Logo Computer Systems. You can obtain both the *Toolkit* and a sample program disk with accompanying documentation from your dealer or from LCS for $12.95.

This is a nifty little combination package and the documentation is also on the back side of one of the disks so that you can print out select portions or the entire listing. In addition to printing pictures, there are several other interesting utilities that LCS encourages you to list and modify to meet your individual needs.

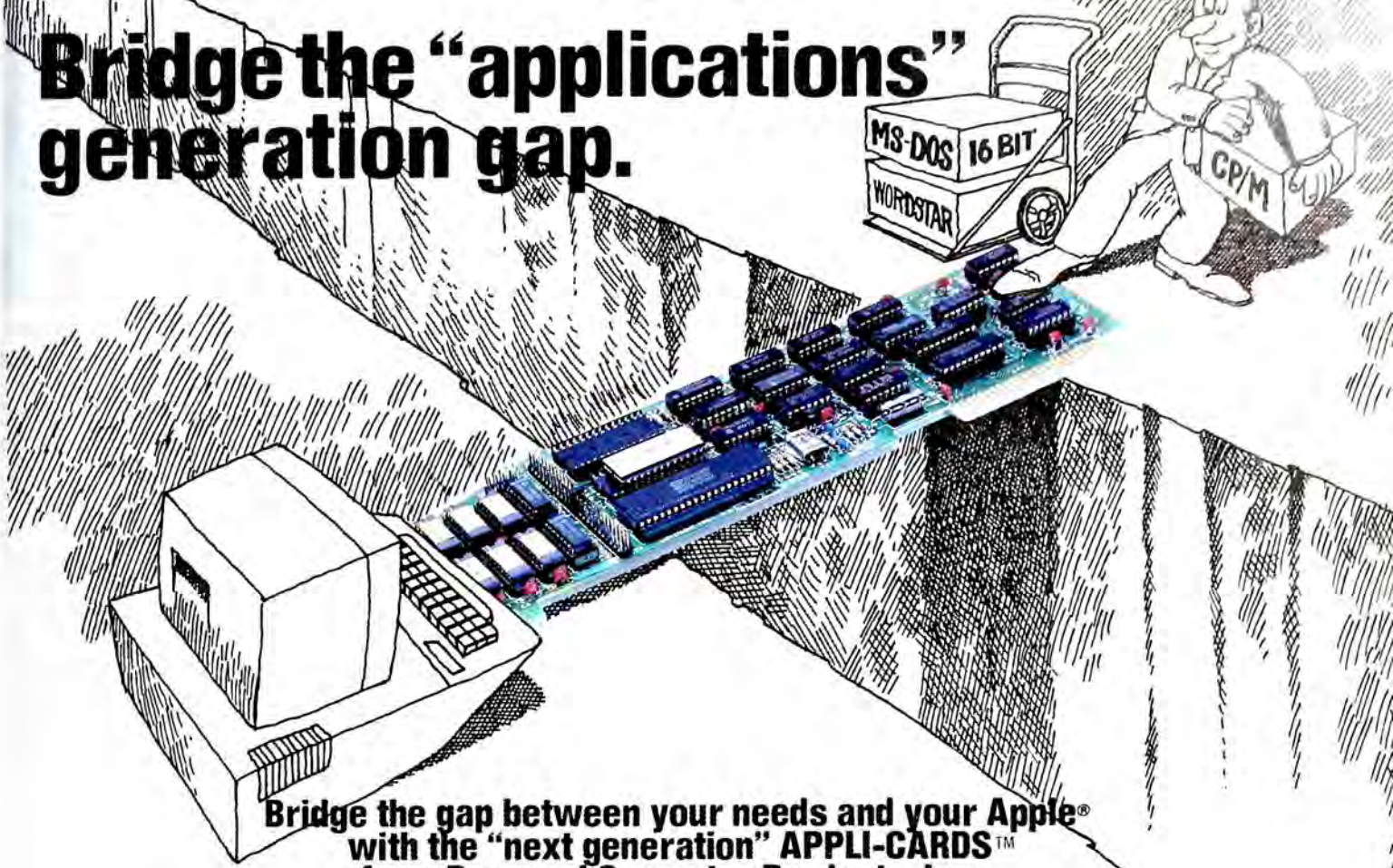
I had intended to end this letter by sharing with readers my favorite *Softalk* departments, but alas, there are too many. It is a very fine publication and I am grateful for the hours of enjoyment and the wealth of knowledge *Softalk* has provided me.
Pam Hale, Spring Valley, NY

Hey, Herb!

To Herb Weisberg (January Open Discussion): I do not know of a word processor that prints out Cyrillic, but if your Okidata prints graphics and you have Apple's *DOS Toolkit* I can make a suggestion. Brun LOADHRCG and load in Cyrillic.Set. Clear the screen and type what you want, spacing over syntax error messages. Switch to the text page and save the graphics page (type *bsave <name>,A$2000,L$2000)*, and then dump it to the printer (inversing it so it's black on white instead of white on black).

I owe a large thank-you to BudgeCo, but I keep putting off writing. My copy of *Pinball Construc-*

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tion Set had a bug in it, so I called BudgeCo in California and they accepted collect charges. They listened to my problem and suggested that I send the disk in. I received it back about a week later, glitch-free, postage paid, and accompanied by a *PCS* poster. I was amazed at how quickly I got it back and how they stood by their product.
Adam Gillitt, Newton, MA

I would like to help Herb Weisberg in Columbus, Ohio. There is a word processor called *The Gutenberg* that comes with Cyrillic, Greek, and French fonts in addition to English ones. In fact, if you have a dot-matrix printer, you can create any foreign fonts, mathematical symbols, or whatever you want with the graphics utility. *The Gutenberg* is made by Micromation (Toronto, Canada) and supports many Epson, Apple, C. Itoh, NEC, Centronics, and Qume printers. I do not know whether your Okidata 92 can cheat *The Gutenberg*.

The Gutenberg is a very powerful, almost perfect word processor. It is also quite complicated, but it offers more than you will ever need. I have not seen it yet, but there is also a version called *The Gutenberg Junior* that seems to be less complicated. However, I do not know if it has the same features as the original.
Edward Mayorca, Natick, MA

This is in answer to Herb Weisberg's question in the January Open Discussion. Computer Station publishes a package called *Combined Graphic Writer* that allows the use of *DOS Toolkit* compatible with character sets from a word processor. The disk comes with twenty-odd sets ready to use, including the Cyrillic set. The only thing you would have to do is determine which keys correspond to which characters of the set. Unfortunately, the version I have does not list the Okidata series of printers among those supported. Mine, however, is a very early version, and the newer version may support a wider selection of printers.

For Marcia Herweyer, also in January: Suntronics sells a disk controller that claims the ability to use standard "Shugart-compatible" drives on an Apple. *Caveat emptor.*
Hal Scoggins, Lake Jackson, TN

For Marcia, a Sun/Tan . . .
In the January Open Discussion, Marcia Herweyer asked for information about interfacing Tandon 100 disk drives and other drives used on the IBM with the Apple IIe. I am currently using the Suntronic disk controller and a Tandon drive on an Apple II with complete satisfaction. One item to be noted about the Suntronic controller is that it will not half-track. This is no problem with disks formatted by DOS 3.3, but disks with copy-protection schemes that utilize half-tracking will not boot. Also to be noted: While the Tandon drives may be interchanged between the IBM and the Apple, the disks on one computer cannot be read by the other computer.

The Diskmaster II by Data Cue is purported to be a controller allowing the use of Tandon drives and other drives from three inches to eight inches. The Diskmaster II has optional operating systems that will allow the Apple to read the disks of IBM and other computers. I have no experience with the Diskmaster II and cannot verify this information.
Edward P. McNally, Granada Hills, CA

. . . Or a Quadlink
To Marcia Herweyer: Try the Quadlink, a card designed to run Apple software on the IBM PC. Before making the purchase, refer to the December 1983 issue of *Creative Computing* (page 53) for a comprehensive discussion of Quadlink applicability.
A.E. Ward, Dallas, TX

Blood-and-Guts Flow Charts
First off, to Mary Jensen (February Open Discussion) and anyone else who wants to do flow charting on their Apple, there is a program just for us. *Flow Charting* by Patton & Patton (San Jose, CA) is just what you're looking for. It is excellent, well documented, and easy to use. See the December 1983 *Softalk* for a review.

I'd also like to thank Sierra On-Line for their superior user support. A while back I managed to trash my wordbook disk from *The Dictionary*. Of course I had not made a backup. I sent them the trashed disk with a note repenting my sins and my Visa number. One week later I received not only a new wordbook disk but the new updated program disk at no charge. In this day and age this type of user support is incredible.
Eric P. King, Mountain View, CA

Through the Magic Window
I would like to direct this letter to Dean A. Park (February Open Discussion). To get *Magic Window II* to recognize a non-*Magic Window* file, you must rename your *Apple Writer II* text files to include a ".MW" at the end of the filename. (This method will work only with text files made by other word processors, not with binary files.) After renaming the file, you must then select "load unformatted file" from the filer subsystem. I use this method all of the time for editing data captured by my terminal program. I also use it to write exec files in DOS. I hope this answers your question.
Scott Linder, El Toro, CA

Lone Star Printing
To Barbara Shapiro (February Open Discussion): If your TI printer is a model 855 or a model 850, like mine, you can coax graphics out of it with any program designed to use an Epson printer. It seems that many if not all of the commands used by the printer are compatible with the Epson. It has been working flawlessly with a Grappler+ and an Apple Super Serial Card. I chose it over the Epson because of its printing speed (150 cps, not to mention the fact that it has a fast line feed), its ability to work in both parallel and serial, and its comparably low price.
Ken Greenlaw, Saint Charles, MO

Underlining Concerns
Reader John Johnson (February Open Discussion) asked how to underline in *Apple Writer IIe* without having to underline periods, commas, or question marks as well. There are several simple solutions. If you are in the left-justify mode, typing control-V control-H control-V after the trailing backslash completely solves this hassle. Alternately, you can embed a control-H (backspace) in a glossary on the backslash key. This lets you use open apple-backslash to do the same thing.

Another way that works in all modes is to let an intelligent printer do the underlining and justifying for you. For instance, on an expanded Diablo 630 daisy-wheel printer, an embedded escape-E starts underlining and an escape-R shuts it off. An embedded escape-M starts microjustifying while escape-X stops it.

The Gila Valley Apple Growers Association maintains an *Apple Writer IIe* voice hot line at

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602-428-4073. They also have a major (six disk sides!) technical documentation package available for the program. The package even lets you capture your own source code for customization and modification.
Don Lancaster, Thatcher, AZ

My solution for fellow South Carolinian John W. Johnson is to get a different word processor. I purchased my Apple IIe in November 1983, and, although I had never used any type of computer before, I have already produced over one hundred pages of manuscript containing a great amount of underlining. The only word processing system I have used is *PFS:Write*, and I really do not see how a program could be easier to use or provide any service not included in this system. Underlining is done almost exactly as on a standard typewriter, the difference being that you depress both the control and shift keys with one hand while depressing the underline key with the other. The underlined words are highlighted on the screen so there is no question about whether or not a particular item has been underlined. Position within a sentence does not matter.
Richard E. Petit, North Myrtle Beach, SC

And Say Hello to Bert
I have a gripe. *Softalk* is a great magazine and I look forward to receiving my copy in the mail every month. My gripe: Why does my mailed copy come at least two weeks after the magazine appears at computer stores? It is very frustrating to see the magazine at the store and wait to receive my copy.

I also want to say thank you to Beagle Bros. Their software is terrific! Not only is it inexpensive, it's copyable, easy to use, and very practical. I had occasion recently to phone the company about use of the text formatter on the *Silicon Salad* disk. Bert Kersey was extremely nice and very helpful. I also asked about possible use of some of their utilities in any commercial educational software I might try to market in the future. To my very pleasant surprise, they do not require a licensing fee—only acknowledgment of use of their product. Many congratulations to Beagle Bros.

Thanks and congratulations also to Penguin Software for selling copyable programs. I would not dream of giving or selling any copyable program to anyone.
Dorothy Wooley-McKay, Phoenix, AZ

Power-Down Plus?
I would like to know if there is an enhancement available for the Apple II Plus that will allow a real power-down reset like the IIe. The problem I have encountered is wiping out my Autostart ROM. I think the major cause was due to having to cycle main power when the keyboard gets locked up. A real power-down reset from the keyboard would save a lot of wear and tear on the machine. Please share any thoughts or comments.
Brian Austin, Chesapeake, VA

Pascal PR
Does anyone know how to do a PR#1 in Apple Pascal? I want the output to appear on both the printer and display. Specifying the printer in every writeln statement is just too cumbersome. It makes the program inflexible.
Kevin Tso, San Francisco, CA

Positively Negative Ions
We have a few Apple computers in our office. However, some of us in the office smoke cigarettes, so we have one or two negative ion generators to clear the office of smoke and other pollution. The negative ion generators are very good; I think they work better than the fan and filter type of air cleaner.

Here is my problem. A few weeks ago the disk drive on my Apple IIe would not work, so I brought it in for repair under my maintenance contract. One of the things the service person mentioned was that there should not be any static electricity near the computer disk drive, and he thought that that may have been the problem causing the disk drive to malfunction. The serviceman showed me the chip on the top of the disk drive and explained that one of the ways to keep it working was to keep it away from static electricity.

Once I got the computer back to the office, I looked around for sources of static electricity and thought that maybe the negative ion generator was the culprit. So I disconnected it and haven't used it since. But now my secretary misses the ion generator and wants to know if it can be reconnected. I miss it too. The trouble is that I am not sure if the ion generator poses a problem to computers, and I don't know how to test it to see if mine is creating a dangerous static charge. My ion generator is supposed to be bipolar, which means that it emits positive and negative ions to prevent electric shocks.

There must be thousands of us who have combined a negative ion generator with an Apple computer. In fact, I have seen at least two computer-supply catalogs that combine the sale of computer supplies with these negative ion generators. Are we destroying our computers?
Robert P. Gasparro, Philadelphia, PA

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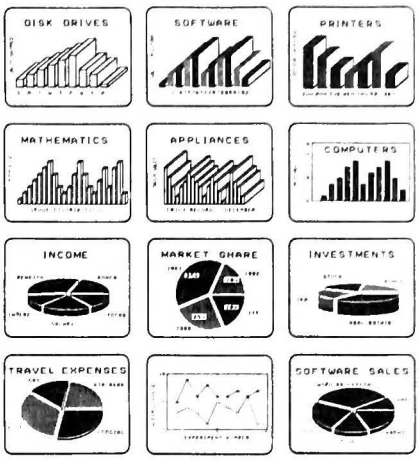
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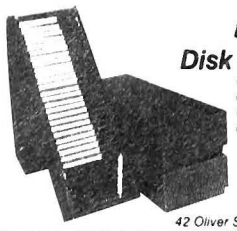
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S O F T A L K



Softly Comment

BUSINESS

The Double Hi-Res VisiSuit

Pioneers VisiCorp and Software Arts are fighting for custody of the first microsoftware giant, while a saddened industry looks on.

by Al Tommervik

Remember the last time you heard that a close friend or relative had died? You wept.

You didn't cry for them, but rather for yourself. You cried for your loss and you cried because the event reminded you of the frailty of the human condition. It's always a shocker to get the harsh reminder that your stay on earth is temporal.

On a lesser scale, remember when your favorite married couple broke up? Intellectually, you knew it was probably best for each of them, but that didn't make you like the event better. You wished time could be reversed to when everything was good. You wished time could be turned back to when everybody would say, "They're just perfect for each other!"

Unfortunately, the clock never moves backward. Time marches inexorably on—bringing with it the deaths and dissolutions that rend the heart.

The microcomputer industry has been remarkably free of those events that bring "real life" so close to home. Other than the death in a car accident of the president of Eagle on the day his company went public, the industry hasn't lost any of its leading citizens. And the spirit of friendliness and cooperation that pervaded the industry in its early days has tenaciously hung in there, even as the cottage companies have grown into small and medium-size firms.

It's because this openness and spirit of generosity have been so pervading that the current legal squabble between VisiCorp and Software Arts has come as such a shock to the industry.

Where could you have found two companies whose interests seemed more closely aligned than the author and the publisher of *VisiCalc*? And how could it be otherwise?

Dan Bricklin had the idea, Bob Frankston had the technical expertise, and Dan Fylstra and

APRIL 1984



Peter Jennings had the cash. Propitious circumstances of geography and opportunity led to *VisiCalc*.

It may be only this writer's opinion, but any just history of civilization must accord the development of *VisiCalc* a position of high honor. *VisiCalc* took the personal computer out of the realm of being a curiosity, a toy, or a special-interest machine and proved that the micro could be a versatile tool for people with wide-ranging interests.

VisiCalc should stand with the printing press, the steam engine, the harnessing of electricity, the development of immunizing agents for virulent diseases, and with computers in general and the microcomputer specifically as a milestone along the path of progress.

Whatever vicissitudes the product henceforth suffers in the marketplace, its place in history should be assured. It's difficult to conceive of an IBM Personal Computer, of *SuperCalc*, or of *1-2-3* without first conceiving of *VisiCalc*.

In that light, it's particularly saddening when the partners who brought us this advance go in different directions. Like your favorite married couple who decide that the imperatives of their personal interests no longer conjoin, the companies have determined that business imperatives dictate a parting of the ways.

Apparently it was VisiCorp that first came to that realization. At least it was VisiCorp that fired the first shot, filing a lawsuit seeking damages because Software Arts was allegedly dilatory in getting upgrades to *VisiCalc* ready for market. Software Arts countersued and then amended that filing to demand the rights to the product back.

Court action is fast and furious. The nifty legal complication is that *VisiCalc* is a copyright of Software Arts but a trademark of VisiCorp. In the last round before this was written, VisiCorp attempted to prevent Software Arts from using the trademark. The court rejected a requested injunction to this effect, and Software Arts promptly announced that it would begin selling *VisiCalc: Advanced Version* for the IBM Personal Computer.

Our hearts go out to the legal combatants. We refuse to believe that Dan Fylstra, Peter Jennings, and Terry Opdendyk acted with anything other than a heavy heart when they determined that it was in VisiCorp's best interest to pursue legal remedies. And we know the anguish of Dan Bricklin, Robert Frankston, Julian Lange, and Tracy Licklider at Software Arts that things have come to this pass.

But while our hearts are saddened, our minds turn to others. At Apple, a group of the original employees attempts to keep alive the spirit that originally pervaded the company and tries to imbue newcomers with that same pioneering and helpful attitude.

At trade shows and anywhere else convenient, some of the pioneers of the software and peripheral industry discuss how to maintain the openness and cordiality that obtained back in the good old days of 1980. The central question at such huddles is whether conducting a sound business necessarily entails stooping to some of the pejorative activities of big business.

Now, looming large behind that question is the issue of whether *VisiCalc* has become the catalyst for a different way of doing business in the microcomputer industry. For all of our sakes, let us hope that this lawsuit is not paving a road upon which the rest of the industry will rush to tread.

Such activities are counterproductive in the macroeconomic sense that they take funds from research and development and put them in lawyers' pockets. Nobody wishes the legal profession ill, but microcomputer owners have got to be more interested in being the beneficiaries of exciting new software products than in the enrichment of a few attorneys.

It's a sad thing to see former compatriots now at odds. The saddest thing about it is the milieu. The microcomputer is supposed to be a tool of the intellect, the tool that will help mankind elevate itself by its bootstraps. Lawsuits revolving around software remind us of the frailty of that hope.



JOURNALISM

Fortune Shines on Mac While Timely Rags Stumble

Macintosh's debut got lots of notice, but, of the major magazines, only a few did all their homework.

by David Durkee

It's a rare event in the computer industry that attracts as much attention in the mainstream news and business press as last January's Macintosh introduction did. In fact, it's unprecedented. It also gives us the irresistible chance to observe and comment on the journalism establishment's coverage of our turf.

Some of the Macintosh stories, it seems, suffered from occasional problems of nearsightedness. At times they seemed to be looking in the wrong places entirely. Of course, major magazines should not be expected to sell the Macintosh to the public, but they might have covered more of what was newsworthy about the Macintosh release. The real news was the innovative approach to computing that the Mac embodies, not the rest of the industry's subservience to the Big Blue standard or the pseudo-Zen aphorisms of Steve ("True artists ship") Jobs.

The PC-compatibility question was a major stumbling block. Yes, most of the industry is dutifully marching behind IBM's standard like sheep to an *abattoir*, but since when has that concerned Apple or its million-plus customers? Nevertheless, *Time* felt compelled to point out that the Mac won't run the IBM PC's software. Did it mention that the PC won't run the Mac's either? *Newsweek* also addressed the compatibility issue in one sentence: "In addition, the Macintosh is not compatible with the IBM PC, the industry's de facto standard." Mammals weren't compatible with dinosaurs, either, but they seem to have survived.

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NOVATION

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the sales of the nearest competition, being developed for Macintosh, the issue of IBM *compatibility* is a somewhat moot point. As Doug Clapp pointed out in his *Infoworld* column (February 27), what the public wants is a computer that runs *1-2-3* and other popular and useful software, not MS-DOS.

When you want to know about Apple or the Macintosh, you get tired of reading over and over again how much people hate/love/fear/admire Steve Jobs. This was another big problem in the *Time* and *Newsweek* articles. Jobs's personality, while perhaps part of the story behind Macintosh, is not the story of Macintosh. Jobs journalism, however, must be the kind of colorful copy that makes some editors happy. *Time* was full of it, practically to the exclusion of telling us about the Macintosh itself.

Newsweek's story took some of the same angle, although its writers did a better job. *Newsweek* also managed to get a little of the spirit of Apple into the story. Quoting a member of the Macintosh team: "We let IBM have the big computers; if we let them have personal computers, a creative human resource might have just been fizzled away." Much of *Newsweek*'s story captured the Apple attitude of trying to change the world.

Newsweek did manage to tell us some about the Mac in its Macintosh story. A sidebar called "Reviewing the Mac" talked about the icon/windows structure of the machine and elicited informed opinions from *1-2-3* author and Lotus president Mitch Kapor. Nevertheless, while *Newsweek* gave an adequate description of *MacPaint* (with picture), its total summary of *MacWrite* was "a word processing program."

To highlight the importance of the Mac's success to Apple, *Time* got this incisive comment from the chairman of Tandy, maker of the TRS-80 line: "If Mac doesn't take off, Apple has to watch out." What made *Time* think that quoting someone from Tandy, even the chairman, would have any relevance to Apple's market? Wouldn't Mitch Kapor return their calls?

Why does *Time* feel compelled to put *mouse* in quotes? Do they have some reasonable doubt that that's the right word? An article on the IBM PC in the *Los Angeles Times* once referred to "the so-called MS-DOS." The mainstream press must think that the computer industry is trying to put one over on them with all the funny technical terms.

The occasional factual errors are also worthy of note. *Time* reported, "But unlike the more expensive Lisa, Mac cannot swap information between different programs." MacWriters who have been gleefully transferring *pictures* from *MacPaint* into their word processor will be amused to hear this bit of news. *Time* also called Lisa's twiggy disk drive a "slimline," which it definitely is not.

The factual errors in *Popular Science*'s Macintosh cover story were outstanding: It reported the Mac's height at twenty inches (off by half a foot) and said the addition of 256K RAM chips would give the Mac more than two megabytes of memory; the larger chips will actually up the Mac's memory to a healthy but more modest 512K. *Popular Science* called the Mac's printer a "modified C. Itoh Image Writer," but Imagewriter is actually Apple's name for the dot-matrix printer, not Itoh's. It even managed to list incorrectly the names of Microsoft's first software packages for the Mac, Microsoft Basic and *Multiplan*, calling them *MicroBasic* and *MicroPlan*.

Fortune, on the other hand, did a fabulous job. Ann M. Morrison, the *Fortune* editor who wrote its Macintosh story, and her research associate, Nancy J. Perry, did their homework. They wrote not only a detailed report on the Macintosh, but they also included a superb analysis of Apple's history, its entire product line, its strengths, and the problems it faces in today's market. They talked about why the Apple IIe, which is based on a design that is now nearly eight years old, is still one of the country's most popular computers. Absent was the usual *People*-type puffery about Steve Jobs. They addressed the issue of IBM compatibility head-on and reduced it to what it was worth: "The Macintosh is deliberately not compatible with the IBM line because, according to Apple, the Mac with its 32-bit microprocessor can do more things better than the PC."

They also aptly pointed out that computer retailers don't necessarily want to live in an entirely IBM world. IBM can afford to set loyalties aside for immediate gain, as it demonstrates by such actions as bypassing independent dealers—establishing its own product centers—and pulling the rug out from under Microsoft and the compatible computer manufacturers—the companies that helped make IBM the de facto standard—by introducing its own proprietary operating system.

For the record, the best coverage of the Macintosh from within the computer magazine industry (Softalk publications excepted, of course) came from *Byte*. Its exhaustive (not just extensive) article covered the computer in great depth, including technical information to interest the engineer, software description to entice the potential user, and coverage of the immediate and long-range market for software and hardware to give any intelligent individual a reasonable picture of where the Macintosh will go.

The article included a sidebar on the system architecture by its designer, Burrell Smith, and one on the system software by Andy Hertzfeld, another first-string member of the Macintosh team. Furthermore, there was a Macintosh memory map with the article, the first such map published for public consumption. A related twenty-page interview with twelve Macintosh principals, including Steve Jobs, offered a ton of fascinating insights into the history, design, and philosophy of the machine.

But the major kudos still goes to *Fortune*. Its Macintosh coverage reeked of objectivity. Such objectivity in journalism is accomplished not just by taking an objective attitude, but by knowing the subject well enough that author biases don't get through and source biases are offset by facts. *Byte* can be expected to know enough about the computer field to accomplish that. *Fortune* managed it even with one foot outside its own turf.

THE MARKET

If at First You Don't Succeed, Pay, Pay Again

To offset the obfuscation in its WordStar and other product manuals, MicroPro is offering tutorial software—at a price.

by Al Tommervik

Gather round, folks; it's time for a lesson in marketing. Today's text is taken from the first book of Rubinstein, chapter MicroPro, verse *WordStar*.

Let's start by giving credit where credit is due. Seymour Rubinstein is certifiably one of the great microcomputer pioneers. Back in the days when micros were young, hackers were hardy, and software publishers thought it was cute to offer a reward to the person who found the most bugs in their commercial programs, Rubinstein saw a niche. It was called word processing, and nobody took it seriously.

Rubinstein did. He studied all the commercial word processors in the micro and other worlds and combined all the best features into one product. This product did everything except put hula girls and warm South Sea breezes on your computer screen. He called it *WordStar*. He built a company called MicroPro around it.

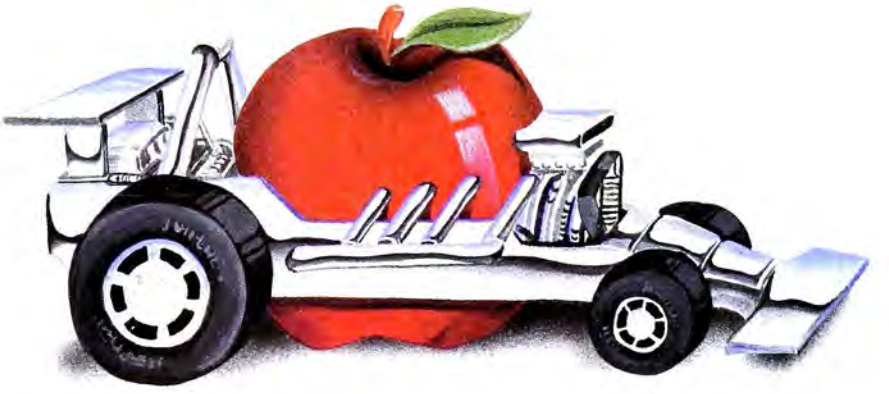
WordStar did more than anything else to validate the microcomputer in the CP/M world. In other venues, *VisiCalc* was the motivating and validating force. In the CP/M world, it was *WordStar*. No matter what slings and arrows of outrageous fortune greet Rubinstein from this time forward, he deserves praise and credit for that pioneering contribution.

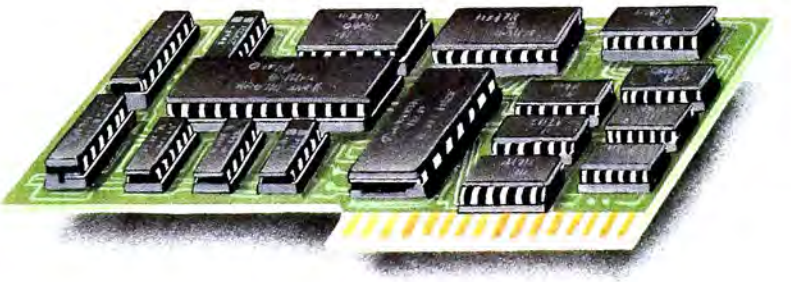
There was only one thing wrong with *WordStar*: You had to be a Phi Beta Kappa Mensa member to learn to use all its features. It helped to be a contortionist, because *WordStar* wanted you to do such things as hit Control-Shift-Escape-Z-P to get one command. That's only a minor exaggeration. It helped to have a finger span as wide as Wiit Chamberlain to put *WordStar* through its paces.

MicroPro aggravated this complexity with some of the most impenetrable user's manuals extant. Some folks have a wonderful time making fun of bureaucratic pronouncements from Washington. They were documents of perfect clarity compared with early *WordStar* manuals. Being conversant with the English language was

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What does a fireman know about designing software? Nothing. Usually.



Meet Dennis Jarvis, a fireman from Southern California. About five years ago, Dennis was injured in a fire-related accident and was confined to the house for about six months. To keep him occupied, Dennis' wife bought him a gift. A computer.

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It was brilliant. Naturally.

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You can print checks of any size and format.

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Dennis? He returned to the Department soon after his leg healed, but remains the spearhead of Firefighter Software.

In fact, in his never-ending efforts to make Firefighter the most personal, most supported software, Dennis has set-up a telephone hotline especially for you. Standing by to answer your questions and provide consultation. That's just Dennis' way of insuring Firefighter remains superior, always simpler yet smarter.

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CA Hotline: (818) 991-8200

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a definite handicap.

Whole other companies now make a major portion of their living supporting *WordStar* with tutorial disks. Among the best are Cdex and ATI. Whole books are written on how to use it. The *WordStar* subindustry is almost as large as the *VisiCalc* and the *dBase* subindustries. Peter McWilliams has made a publishing career out of damning computers that aren't *WordStar*-friendly.

So if you were Seymour Rubinstein and you had a couple of million dollars lying around, what would you do—make *WordStar* easier, or go into competition with the folks who really support the product? Plug into the equation that you're about to take MicroPro public, allowing other folks to get a piece of the action for as little as eleven to thirteen dollars a share.

Obviously, a broader product line is desirable in the public's eye. So what line to get into? Tutorials. What to teach? How to use *WordStar*!

Published estimates are that MicroPro has spent a cool two million creating tutorial programs on how to use its products. The company will let you in on the secret for only $80, plus or minus sales tax. Of course, that's only after you've spent the $495 to buy the product in the first place, in all probability assuming it was comprehensible.

One ponders two critical points. How far would the two million have gone toward making *WordStar* easy to use? How hypocritical is it to charge $495 for a program that requires another eighty bucks to learn how to use it?

Personally, I don't care. I'll buy MicroPro stock anyway and hope the public is as ignorant as H.L. Mencken always assumed that it was. If it isn't, my investment will have tough sledding. But not as tough as MicroPro will have.



PETER McWILLIAMS
Personal Computers

PERSONALITIES

McWilliams: He Costs Too Much

Computerdom's self-appointed guru of product value, syndicated columnist Peter McWilliams shuns progress for comfort and fact for feeling.

by Matt Yuen

We definitely need more writers like Peter McWilliams. Better still, we need more *people* like Peter McWilliams.

McWilliams is strong; McWilliams is bold. He's not afraid to tell things the way he sees them, regardless of possible repercussions. He's willing to help us understand things using his logic, rather than developing logic of our own. And heaven knows how much we hate making decisions.

What makes McWilliams such a great writer is that he writes from the gut. Not that he lets ego get in the way of objectivity; rather, he goes to his heart for information instead of relying lazily on facts and truths. Any responsible person with concern for the reader can consult experts, read manuals, and check facts before recording accurate information on paper. Only the intrepid McWilliams has the courage to "search his feelings," as a Jedi master once put it, for subjective opinions.

In his syndicated newspaper column last February, McWilliams demonstrated this style superbly. When he could find virtually nothing wrong with Macintosh, he ignored facts and introduced some opinions of his own to fit his purpose. What a skillful writer.

A favorite was his reference to the Mac brochure, which shows a blank IBM monochrome display, captioned "Business graphics before Macintosh," and Mac's screen with bar charts galore, captioned, "Microsoft's *Chart* for Macintosh." McWilliams wonders what Mitch Kapor, whose *1-2-3* program does fine graphics on the IBM, would say about a lie like that. He might say, "Gee, Peter, I guess you didn't know you need a special graphics adapter on the IBM to do the graphics of *1-2-3*. It's in the manual." (Apple did mention that the comparison used an IBM monochrome display. How sneaky of them to put that at the bottom of the page!)

Give McWilliams a break; after all, he's a respected writer. Just look at the back cover of his books and you can see how the critics love to praise him.

On word processors, McWilliams "names names and suggests exactly what to look for," according to the *New York Times*. *The Word Processing Book* is exactly what people who can't think for themselves need. To say he takes readers by the hand and tells them what to buy isn't accurate. Instead, he shines generous light on what he does like, throws eggs at what he doesn't, and says, "Which would you prefer?" Freedom of choice is what makes this country great, and it's the foundation of McWilliams's style.

TV Guide called McWilliams's *The Personal Computer Book* "the most useful and amusing computer book available today." It didn't say what it was useful for or why it was amusing, but we'll just assume the expertise that goes into television magazines is sufficient to judge computer books.

Admirable and respectable man that Peter McWilliams is, how come so many people who have anything to do with computers think such nasty things about him? Is it because his books have more to do with himself than they do with computers or word processing? That can't be it. If they were titled *The Peter McWilliams Books*, they'd never sell. How else does he expect people to read about him unless the book's title makes it sound like something it's not? The United States is a capitalist country, and old McWilliams is capitalizing on people who want to learn about computers. You can't hate a guy who's doing his part to strengthen the backbone of America.

Or is it because he's making a lot of money selling the books? Nope. Some guy made a lot of money by putting rocks in boxes and selling them as pets. Nobody hated him.

Truth is, it's envy. We envy McWilliams. This holds true especially for members of the microcomputer community who wish they were able to take an ignorant public and milk it for every dollar possible. And nowhere does envy rear its ugly head more often than in the print medium. A lot of professional writers would like to abandon ethics and social obligations just long enough to crank out some books like McWilliams's and have them hit the bestseller list like his did.

InfoWorld's Kathy Chin may be one such writer. Unfortunately, as a reporter for a respected weekly computer journal, Chin happened to make an egregious error. In a review of McWilliams's *Questions & Answers On Word Processing*, she was honest.

Her review started by instructing readers,

"Don't read [the book] if you want to learn something about word processing. Do read this book if you like Doonesbury cartoons, lithograph prints, and photos of old movies." She accused McWilliams of talking too much about himself and apologizing for his misinformation in *The Word Processing Book*. Her accusations were all valid, but what place does validity and truth have in journalism?

In response to the review, McWilliams said that some people liked the chatty style in *The Word Processing Book*, while others didn't. The ones who liked it wrote nice letters. "It is for those people that *Questions & Answers* was written," replied the writer extraordinaire. You see, Kathy? Again, the book wasn't written to inform, despite its title; it was meant to satiate the hunger of McWilliams's cult following who already like him. The purpose of the *National Enquirer* isn't to tell about issues important to the world. Give McWilliams a break.

Apple owners, the group of people who growl at McWilliams the loudest, should shut up and start loving the guy. While his complaints about microcomputers in general are that they're too limited, the display looks fuzzy, and that they don't do word processing well enough, his main complaint about Apples is how much they cost.

McWilliams uses *overpriced* a lot when talking about the Apple, and he deserves high praise for doing so. Sure, people are buying IIes like crazy, but McWilliams feels Apple is charging too much for them. His premise: the Commodore 64 costs about $599 and the Atari 1200XL about $799. Conclusion: Apple can obviously afford to sell the IIe for $800 less than its list price of $1,395.

Why McWilliams stops there must be because of modesty. He could be phoning up the Rolls-Royce people and saying, "Look, an '84 Ford Escort goes for $5,496. Don't you think you're asking a bit much for your cars?"

And what about his own books? They're about as funny as *Mad* magazine, and they cost many times what *Mad* costs. Probably the only reason he doesn't call up his publisher, Prelude Press, and tell them to charge less for his books is because it's his publishing company, and he doesn't like to get angry phone calls.

Last February, McWilliams almost said something nice about Apples in his column. But after he told us some more about himself (four of the first five paragraphs began with *I*; but then, we never do get enough information about him), he underlined the position that Apples in general, and Lisas and Macintoshes in particular, cost too much. Hooray! Finally Western civilization has given birth to a person who has the wisdom and guts to say that the basic laws of economics are a crock of bull. And all this time economists were telling us that if consumers are willing to pay what the producer charges, and both parties are generally satisfied, we have an equilibrium. What fools we were to swallow that nonsense!

Apples *are* overpriced. But then, so are condominiums, Mediterranean cruises, World Series tickets, Bel-Air mansions, Jaguars, private jets, parachuting lessons, lift tickets, space shuttles, diamonds, mink stoles, bottles of Moet et Chandon, and Beatles paraphernalia. If the typical consumer can't afford it, it's overpriced. What could be simpler?

"Apples, for most people," he says, "are not a good value. Almost any task can be performed better, and for less money, on another computer." Since he doesn't mention any specifics, we can safely assume that he means spreadsheet analysis, word processing, graphing, and programming on the Commodore, Atari, TRS-80, Timex, Texas Instruments, Coleco, and Heathkit computers. And since this is McWilliams's opinion, we can take it as truth. After all, he's published a whole lot more books than most of us.

Macintosh comes with a single 3 1/2-inch drive, a thirty-two-bit processor, and 128K of memory. It costs $2,495. A "comparably equipped" IBM PC sells for $3,135. "Given IBM's reputation and support, which would you choose for your business?" he asks. IBM, of course. Why would anyone of sound mind want to pick a technologically superior machine that costs less? There must be something wrong with it.

"The IBM PC*jr*" (with color—Mac has only black and white in 512-by-342 resolution) retails for about $1,800. "Which would you choose for your home?" asks McWilliams. Obviously the Junior. Forget that Apple isn't aiming Mac at the home market. You wouldn't buy a Ferrari to teach your kids how to drive, would you? Kudos to McWilliams for opening our eyes.

We all owe McWilliams a bundle of thanks. Without the wisdom and deep insight he's given us, we might have walked blindly into a hell of no return. He's saved some of us from possibly discovering how fun and intriguing computers can be; he was too late for people with names like Blank, Lebling, Budge, Gorlin, Kapor, Woodhead, Greenberg, Kersey, Lutus, Garriott, Bricklin, and Frankston, who were seduced by them long ago. Tragically, the list goes on. Such a waste.

Heroes come around too seldom and in few numbers. For those of us who don't care about the public's need for solid information, for the few who truly appreciate a person who dauntlessly relies on personal feelings rather than on facts, and for the mindless masses who need someone else to form opinions for them, thank you, Peter McWilliams.

APRIL FIRST

Exec Slipshod: Dusting a Soft Crop

The well-known publisher of Cropduster *stoops to working out of an RV in the plains of South Dakota.*

by Andrew Christie

George Spelvin grins, the mellow flickering firelight reflecting off his teeth.

"Watch this," he says.

He pulls up his right pants leg and plucks a small nickel-plated derringer from the top of his sock. He aims casually and pulls the trigger. A flat crack echoes through the canyon, and a bullet whines off a granite outcropping two feet to the left of a young programmer's head. The programmer jumps several feet in the air and lands in a trembling heap.

Spelvin leans back and laughs hysterically.

"Gawd, George," screams the programmer, "Whadja do that for? I wasn't doing anything, I was just standing there! Gawd ahmighty, George—"

"You were silhouetted against the horizon, Plantowsky," Spelvin roars back. "I could see you as plain as a goddamn oil painting! I'm not gonna tell you about that again."

The programmer scuttles away like a panicked hermit crab.

Gotta Be Starting Something. Many legends began in the Black Hills of South Dakota. They're a strange and magical place—the mystic sanctuary of the Great Manitou of the Oglala Sioux. Born here were the tales of Paul Bunyan, mighty lumberjack; Joe Magarack, mighty steel-smeltin' man; Mike Fink, ace keelboat hauler; and, in a later day, George Spelvin, computer entrepreneur extraordinaire and the founder of Slipshod Software.

To understand the whole Slipshod story, it is necessary to go back a ways, back to the early days, back to the beginning.

At the close of the Mesozoic era, the inland seas of the western hemisphere were growing shallow, depositing the sediments that would become the Great Plains. As the seas shrank, marshlands appeared, swamp gases collected; suddenly, there was a large belch, and the Black Hills were born.

Time passed, and the region became run down, degenerating into windswept mesas and deep, twisting ravines where the sun never penetrated to the valley floor.

It was, frankly, boring. Spelvin points out the sluggish sales activity of this period, and has several graphs that chart a dramatic change from the time the dinosaurs came in.

"The dinosaurs livened things up," Spelvin says. "They got things done, and they did things no one else could do. They had the strength. They had the clout. Nobody pushed them around."

To Spelvin, the disappearance of the dinosaurs marked the beginning of a long decline for the North American land mass. He points out that their disappearance has never been adequately explained, and hints darkly at possible forces that may have wanted the saurians out of the way. He also thinks that some of them—"the smart ones"—escaped,

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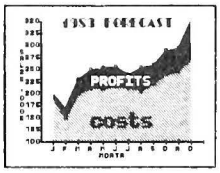
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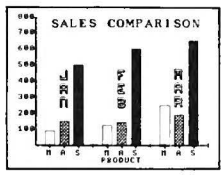
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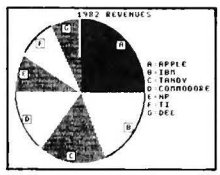
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and are hiding out in the Badlands.

That's where Slipshod Software is tonight, its modest campfire sheltered in the lee of a Windstream trailer and the dark, hulking shape of a motor home.

"They're out there," murmurs Spelvin, "waiting. . . ."

Some say George Spelvin is one of them. He takes that as a compliment. He is a survivor.

In My Life. George Spelvin came into the world in the depths of the Depression. His father, Phineas, was an unemployed Rapid City stonemason; his mother, Cora Lee, was one of the first telephone operators in the South Dakota Bell system.

For young George, the seeds of the future were sown when Phineas Spelvin joined the WPA Dinosaur Park project in Rapid City. The elder Spelvin formed the molds and poured cement for the left haunch and tail of the brontosaurus. A freak accident on the site hospitalized several workers and caused considerable bad feelings among the crew, who blamed management for hazardous working conditions. Arrested as a ringleader in the subsequent Dino Park Strike, Phineas Spelvin was jailed for a time and his case became such a cause celebre in the Rapid City papers ("Dino Man: Anatomy of a Frame") that the judge declared a mistrial, ruling that Spelvin could not receive a fair hearing due to pretrial publicity. Shortly afterward, Phineas Spelvin perished in another mysterious industrial accident.

George Spelvin traces his lifelong distrust of authority to this time.

To help support his mother, Spelvin took a job as a teacher's aide in the South Dakota School of Mines. He held the position for the next twenty years, during the course of which he had occasion to observe the geologists: "I watched the big-deal scientists with their oscilloscopes and generators and stuff; I saw them playing with their computers."

He was particularly attentive the day the School of Mines got its first Apple. Fascinated, he borrowed it from the school one night, quit his position the next day, and went off to teach himself programming. He discovered he had an aptitude for engineering and took apart the Apple to see what made it tick. Shortly afterward, he developed the Crazy Horse, the grandfather of the Apple-compatible computers and spiritual prototype for all those that followed.

Men Who Made the West. Slipshod's nomadic existence has given the company a fluid quality in terms of staff, but there is a hard core of regulars. The hardest of these is Slipshod's chief financial officer, George "the Fixer" Snoozeoff.

Spelvin first made the acquaintance of Snoozeoff, consigliere to one of the largest and most influential of the Rapid City "families," while making the rounds with the Crazy Horse in search of a potential distributor. During their initial meeting, Snoozeoff noticed that Spelvin would frequently break off in the middle of conversation to scribble notes furiously on napkins, then stuff them into his pockets. Finally, confronted with threats of bodily harm, Spelvin shyly displayed his notes on designs for various games, calling them "just a little hobby." Snoozeoff convinced Spelvin that his future was in software rather than in the Crazy Horse, and the two were in business.

Snoozeoff convinced Spelvin to hire Slipshod's technical manager and play tester Uriah R. Stukk shortly after seeing Spelvin's first finished games. In the earliest effort, *Stegosaur Chase*, programmed in Fortran, the player has to avoid lumbering saurians in a ticktacktoe-style maze. Spelvin blamed disappointing sales on limited distribution and Slipshod's lack of a mailing address. *Migrant Farm Worker*, *Dinos in the Snow*, and *Death Race 1957* followed, receiving much the same reception, before Spelvin hit on *Cropduster*, Slipshod's first arcade business simulation adventure.

George Snoozeoff's tough-minded business acumen contrasts dramatically with the boyish enthusiasm of Slipshod's vice president of creative development, George "Punk" Plantowsky. The energetic five-foot, four-inch, 280-pound programmer has a permanent nook in a corner of the company Windstream trailer, which is largely occupied by a complete set of Marvel comic books, mixed media artworks in various stages of completion, and a five-inch Sony television connected to an earth station dish antenna bolted to the top of the Windstream. Plantowsky watches *Bonanza* reruns beamed in from around the world, seven times a day, in several different languages.

Cora Lee Spelvin, having risen to an executive position with South Dakota Bell, continued to look out for her son's best interests in the early days of the company, keeping his various phone numbers unavailable to the overcurious. At one time, she succeeded in having George appointed, in absentia, to the board of directors, assuring a steady flow of income at a time when his company desperately needed it. These arrangements accidentally came to light in the AT&T divestiture, and Ms. Spelvin now frequently joins her son on the road, which he allows in acknowledgment of her past service.

For the near future, Slipshod plans to continue to build on what it learned from *Cropduster*, following its now-well-established software policy of producing involved, complex, obtuse, slightly obnoxious programs that present a single point of view and have some relevance to social issues. Major upcoming releases include *Miner 1939er*, simulating unsafe working conditions in Appalachian coal mines of the day; *Boplifter*, in which the player must save an avant-garde musical form from commercialization; *Val Gal*, Slipshod's first "talking" game; and *Cropduster Utility Pak 3*, out in time for the 1983 tax returns, and free to those owners of *Utility Pak 2* who send in their $170 update fee.

What's in a Name? The stars are out over the Badlands, their celestial light making Slipshod's Windstream headquarters, squatting in the shadow of Vampire Peak, look like a gigantic, dully gleaming alien chrysalis attached to a motor home. Crickets scrape listlessly in the sagebrush.

It is at such moments that George Spelvin is wont to pop the top on a jug of Thunderbird, pour a drink for the dead men, and expound on his business philosophy: "Give the customer what you have."

Spelvin considers himself a pioneer, a lineal descendant of those who stampeded the Dakota prairies and overran Sioux reservation land just after the French Creek gold strike, in the last and most illegal gold rush of the Old West.

"There's a lot of crap out there, excuse my French," says the plain-spoken CEO. "Most of it's either irritating or useless and there are very few exceptions, including us. You've got to be an idiot to buck the trend. I'm here to take the money and run. Don't talk to me about customer support and three-month beta-test periods. That's a *drag*, my friend. That is a stone misery. I don't move the product out the door, I don't eat. We'll have fifty-eight new programs out for the third quarter of this year. One of them is bound to be okay, and several at least halfway decent. When they hit, I know I've got three to five weeks of solid sales before word of mouth starts to kill me. Then it's time to move again. Hey, are you recording this?"

Moving Right Along. Blasting down U.S. Alt. Rte.16, somewhere between Spearfish and Kedoka, Spelvin is at the wheel; Brubeck is on the tape deck; Plantowsky, as always, is in the back of the Windstream, programming, listening to Little Joe shout a warning to Hoss in gruff Japanese; a half-finished sculpture of singer Debbie Harry lies on its side in the kitchenette. Slipshod Software is in its element.

George Spelvin is evidently content with the way things have turned out, though it was a long, occasionally hard road from the South Dakota School of Mines. He still carries the scars from the bitter court battle with CE Software over *InvisiCalc*. (CE got the program; Slipshod maintained the rights to the Kick-Ass Operating System on which it was developed.) His wife, immortalized in the semiautobiographical *Cropduster*, left him for the seductive lights of Hollywood when he was struggling to make Slipshod into a going concern. He still thinks of her.

"Georgina was special. At least I thought she was special. She wasn't, though. She was just like all the rest. They're all the same. May she rot in hell for what she did to me. Ha-ha, just kidding. Really, I hope she's happy now. She certainly seems happy."

For a moment, his eyes appear to mist over, then they harden and narrow into thin slits.

He grabs the CB mike in one fist and thumbs the send button.

"Snoozeoff, whattaya got for me?"

"The locals are getting itchy, Georgie. Drop down to Denver and cool it for a while. And see if you can squeeze some juice out of operations there."

"Who's the capo?"

"Little Iggy. He's getting soft. Rapid City wants you should talk to him a little. If he can't listen like a reasonable fella, they figure he's due for some reprogramming."

"Check. What about the magazine guy?"

"Ditch him. Pat him down for a wire first."

Dwindling from view against the majestic sunset until it is just a silver speck in the darkening, increasingly chilly vastness of the Great Plains, the whine of its mighty diesel turbine fading until it seems no more than the sleepy buzz of a lonesome mosquito, Slipshod Software drives on, passing from its wholly remarkable present into a thoroughly unguessable future. ■











EXEC QUALITY SOFTWARE

At Home in Apple Manor

BY DAVID HUNTER

What can you say about a company that has successfully published arcade, board, strategy, and fantasy role-playing games, as well as utilities and books? What can you say about a company that was approached by Atari to perform some of those all-important machine-to-machine software conversions? What can you say about a company that has just eleven employees five years after opening its doors and is not worried about the future? What can you say about a company that is concerned more with putting out products it likes than about making big bucks?

At first glance, Quality Software looks like a hundred other companies that have surfaced in the last six years—two ambitious aerospace engineers buy a micro, start a company, and achieve early success. But the similarities between Quality and other software companies are not half as interesting as the differences.

Two Guys Named Bob. The founders of Quality Software—Bob Christiansen and Bob Pierce—are bright, articulate, determined, and excited. The explosive growth, fame, and resultant large-scale problems of a company like Sierra On-Line have eluded the two Bobs to date. And the pair is happy with the way things have turned out so far.

"If anything I'm surprised at the more or less steady growth," says Pierce. "It hasn't really been fast."

Christiansen and Pierce met at Lockheed in Burbank, California, where both worked on the ill-fated SST project. When that project fell through for Lockheed, the pair moved on to military operations research, specifically, antisubmarine warfare.

Christiansen, who was born in Hollywood and grew up in Orange County, is a big, friendly guy, full of energy. The UCLA graduate can recall some of the mistakes he made and low points of Quality's history with a lively sense of humor.

Bob Pierce is a native of Huron, South Dakota. He attended Carleton College in Minnesota and went to graduate school at Harvard, where he studied math. Before joining the aerospace business, Pierce taught math at Wellesley College and Harvard.

In early 1974, Christiansen left Lockheed and joined a small engineering firm in Sherman Oaks, California, called SDP. While there, Christiansen did the same kind of military research that he had been involved in at Lockheed. Pierce joined him a year and a half later.

The Bobs worked frequently with mainframe computers at SDP and picked up some programming skills. When micros started to appear in the midseventies, the two friends were intrigued. Christiansen recalls visiting a Byte Shop and realizing that a new, exciting industry was just around the corner.

Compal Custody. Late in 1977, the pair bought a microcomputer from Compal, a local southern California company. Every other week, the two traded off custody of the machine, which was 8080-based and had 16K. Both Bobs had their own pet programming projects right at the start. Pierce worked on a chess program and Christiansen tackled backgammon.

After four or five months, Christiansen had a version of his backgammon game that played fairly smoothly. He talked to the owner of Compal and the game was brought out for that machine. Titled *Fastgammon*, the game was a minor success and the pair decided that they needed to get into a more popular computer. They borrowed a Radio Shack computer and began work on a version of *Fastgammon* for the TRS-80.

By late fall 1978, the pair started seriously to think about starting a company. They decided to place an ad in *Creative Computing*, but they lacked a name for the firm. "We wanted a name that was solid, that meant something . . . like quality," recalls Christiansen. "Well, we never came up with something better."

One of the triumphant moments in the early history of Quality, one of those whirlwind affairs that leave a company breathless and excited about the future, occurred at the West Coast Computer Faire in November 1978. The two Bobs had taken a modest

Quality's movers and shakers: top, executive vice president Bob Christiansen and president Bob Pierce; center, chief author and programmer Don Worth; bottom, marketing director Sandy Pierce and software development specialist Pieter Lechner.



Front row: Jeff Weinstein, Sandy Pierce, Denise Delgado, Donna Rohrer, Kathy Schmidt, and Louis Savian. Back row: Vic Grenrock, Bob Christensen, Don Worth, Mike Albanese, Pieter Lechner, Bob Pierce, and Jim Kingman.

booth and hawked the Compal and TRS-80 versions of Christiansen's *Fastgammon*. The positive response the program received from the software-starved masses was enough to convince the pair that they had chosen the right business.

At the same show, they also demoed a "kind of text" version of the game on an Apple, according to Christiansen. They had just started converting the game to the Apple II, another popular machine they had set their sights on. It was the beginning of a beautiful relationship.

The Apple version of *Fastgammon* first appeared on the market in January 1979. As for Pierce's chess program, the pair saw a well-entrenched *Sargon* and forsook the project. *Fastgammon*, which still sells copies each month, has only gone through one major update in its lifetime. That occurred late in 1979, when Gary Shannon, a local programmer, helped Christiansen add color to the already snappy board game. One reason that the game has remained unchanged for so long, according to Christiansen, is that the backgammon craze never really caught on.

Divination Derby. In those first years, Christiansen and Pierce decided to make it a company policy to divine what the next important computer would be and then go all out to become the chief supplier of software for that machine. Fortunately, they tried this only once and learned a lesson.

In 1979, a computer called Sorcerer came onto the market and caused a brief stir in the industry. Manufactured by a company called Exidy, with better graphics than the Apple, Sorcerer fit the criteria for "the next important computer" and Quality bought one of the first units sold. In a short time, all of Quality's product line was available for the Sorcerer and the company seemed indeed to be the chief supplier of software for the new machine.

Needless to say, the Sorcerer came and went like a medicine man's traveling caravan. For Quality, Sorcerer's brief rise and fall was no great disaster, but it caused Christiansen and Pierce to rethink their strategies. It wasn't so much that their powers of divination were inadequate, but that the whole approach was wrong. If Sorcerer had been a success, it would have taken Quality into waters the company was not equipped to traverse—word processing, personal finance, and small business.

The Sorcerer song and dance ended on an upbeat note. Christiansen and Pierce had picked up several products for the Sorcerer from a programmer by the name of Vic Tolomei. Working at first with Exidy and then on his own, Tolomei had written a software internals manual for the Sorcerer, which the two Bobs also picked up. While attending a computer show in New York, Christiansen and Pierce noticed that Tolomei's book sold like hot cakes.

"We had an inkling right there," says Christiansen, "that computer books were in great demand, specifically technically oriented books."

Tolomei was instrumental in introducing Christiansen and Pierce to the three founders—Bob Male, Frank Wood, and Don Worth—of the Software Factory, a small company based in nearby Newhall, California. The Software Factory is one of those classic one-year companies that end operations because the principals just don't have the black hearts of businessmen, the wherewithal to stick to it.

Newhall Haul. The Software Factory had a number of good entertainment products, but the daily business pressure was too much for Worth, Male, and Wood. They were looking for a buyer and found one in Quality. Late in 1980, Christiansen and Pierce acquired all of Software Factory's programs. The titles included Worth's *Beneath Apple Manor*, *Linker*, and *Babble*, and Male's *AstroApple*.

It's hard to find fault with Christiansen and Pierce's early moves in the industry. They picked up *Beneath Apple Manor* when fantasy role-playing games were just starting to capture the public's fancy. Quality came out with the first home/arcade game in the *Asteroids* genre in 1980. At first called *Asteroids in Space* (before Atari made them change the name to *Meteoroids in Space*), the program was more than a modest hit—grabbing the sixth spot on *Softalk*'s second Top Thirty bestselling software poll (November 1980).

Despite the success of *Asteroids in Space*, Quality has never brought out another arcade-type game for the Apple. "The kinds of projects we like are ones that have technical depth," says Christiansen. "Still, we've enjoyed all the things we've done."

Some might argue that the arcade game battle wasn't over yet and that Quality should have tried to capitalize on the success of *Asteroids in Space*. In retrospect, there is hardly any doubt that Christiansen and Pierce were right to leave that fickle market alone. Only a select few companies have had lasting success in arcade games, while many companies have sunk faster than they might have otherwise by risking too much on the difficult-to-predict games market.

Besides, Quality had a different scheme cooking—computer books—that shows they were not off the mark at all.

Beyond the Valley of the DOS. Quality's second book, *Beneath Apple DOS*, was intended to serve as a companion to Apple's DOS manual, and it's a comment of sorts on Apple's technical support that the book has sold more than eighty thousand copies. Written by Don Worth and Pieter Lechner, the book shows users how to achieve direct assembly language access to DOS, fix damaged disks, and customize DOS. It provides a lot of information that is not present in Apple's own documentation.

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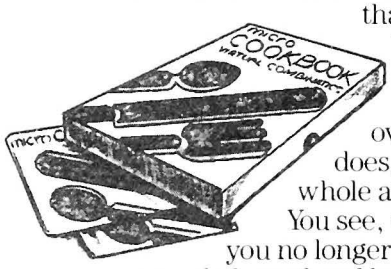
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Worth, a native of San Gabriel, California, was at the University of California at San Diego taking preengineering courses when he attended a free course on computers. He's been hooked on computing ever since, he says. In 1968 he transferred to UCLA and studied computer science. While at UCLA, he used the school's computers to create an astrology program in Fortran. *Babble*, a grammar generator, is another project that Worth worked on at UCLA.

After completing his studies, Worth became a consultant for the UCLA Academic Computer Facility. On the job, he met Bob Male, another computer enthusiast, and they each went halfway on the price of an Apple.

Worth wrote *Beneath Apple Manor* in Integer Basic with no disk drive and no printer. He made notes on program changes while watching different people play the game.

Worth, Male, and another UCLA buddy, Frank Wood, formed the Software Factory to sell their games to Apple and TRS-80 owners. When they turned the company's product line over to Quality, Worth calls it the "best decision I ever made." Since then, Wood and Male have gone off in their own directions; Worth is the only one of the three to continue a relationship with Quality.

Currently, Worth is putting the finishing touches on *Beneath Apple ProDOS*, a volume addressing Apple's new operating system for the IIe, while still holding down his full-time job at UCLA. "Right now, I'm comfortable," he says. "I prefer to work at home and I like the security of a paycheck every month."

Coauthor! Coauthor! *Beneath Apple DOS*'s coauthor, Pieter M. Lechner, bought an Apple in June 1978. He was working as a carpenter at the time. He says he's always been interested in technical things and bought the computer because he wanted "to see what it was about." Like many other pioneers in this industry, Lechner taught himself to program.

Lechner, a native of Buffalo, New York, attended Pepperdine University in southern California and studied math. Upon graduating, he went to work for TRW as an engineer. However, after a year, he was "laid off, along with about a third of the company."

Lechner spent the next two to three years doing odd jobs while trying to get back into aerospace. In 1979 ComputerLand of South Bay offered him a job as a salesman. He worked at the store for a year and a half—in that position and as a technical support person.

Lechner met Don Worth at a computer store in Burbank, where Worth was giving a talk on Apple DOS. The two got together after Worth's talk and struck up a friendship. It was Lechner who first tried to convince Worth to write a book about DOS.

"He said he'd write it, if I wrote half," recalls Lechner.

Lechner worked on *Beneath Apple DOS* while still at ComputerLand of South Bay. In late 1980 he transferred to his boss's other business, Continental Software. (His boss, of course, was Jim Sadlier.) While at Continental, Lechner worked on various programming projects, some of which appear in *Bag of Tricks*—Worth and Lechner's book/software follow-up to *Beneath Apple DOS*.

Worth introduced Lechner to the folks at Quality. "I agreed with Don that the two Bobs would do a good job with *Beneath Apple DOS*," he says.

Beneath Apple DOS came out in June 1981 and Lechner joined Quality in the early fall of 1981, after having worked at Continental for a year.

Nowadays, Lechner works on new book and software projects, as well as providing customer support on Apple products on Tuesday and Friday afternoons. He is busy right now with *Beneath Apple ProDOS*, which is due out in May.

"The Bobs make the final decisions, but they give me a chance to input my ideas," says Lechner, who seems content at Quality.

Quality Relationship. Sandy Pierce, Bob's wife, became Quality's first employee, when the company still had no official offices. "I remember packaging *Fastgammon* in my former sewing room," she says. In those early days, Sandy would do just about anything that needed doing at Quality, such as answering phones, keeping the books, and shipping products. She was a tad overqualified for the position.

Sandy had worked for eleven years in the data processing division and in marketing at IBM, retiring from Big Blue when the two Bobs asked her to help out with the business. The decision to work at Quality is one she's never regretted. "It's been great to be involved. It's easier to be more understanding when I know what Bob's doing and why."

Sandy Pierce is now Quality's marketing director and "make a lot of decisions on my own," she says. She handles most of the administrative details in the office, in addition to running her more or less one-woman marketing department.

As the chief marketing person, Pierce is more than willing to talk about Quality's future directions.

"We'll definitely be putting out more technical books. I've been pushing for education, but I don't see it happening any time soon because we just don't have the expertise. Arcade games? Zip. Likewise, business is not an area we want to pursue."

Sandy believes that Quality can keep pace with the changing industry, though marketing is still a tough area to figure out.

"When we started, even if we ran a small ad, all the dealers would call us," she says. Now it is the software company's job to reach the dealers. Software marketing has become a battle for shelf space, like it has been in the book industry for decades.

"*Beneath Apple DOS* was a product that was very badly needed," she explains. Today, more than ever, "the quality of a product is really going to make it a success or a flop."

Quality Control. Kathy Schmidt, Quality's second employee, joined the firm in September 1980—a year after Christiansen and Pierce had moved the company into an office in Reseda, California. Schmidt, whose background is biology and theater, helped Sandy Pierce with the myriad details of operating a publishing house.

"Sandy and I did what five people do now," she recalls.

Schmidt is one of those energetic young people who are so much a part of this industry, who give it life and fresh ideas. But she almost sacrificed too much. In large part because of a terrible incident she had the misfortune to be caught in, Schmidt left Quality in the fall of 1981.

Schmidt calls it the "most exciting experience" she's had in the software business, but a better description might be the "most horrible experience imaginable." Schmidt attended the Fall Comdex in Las Vegas in November 1980. She stayed at the MGM Grand Hotel and came perilously close to being a casualty in the fire that broke out in the hotel's casino on November 18.

When the fire started a little after 7:00 a.m., Schmidt was asleep in her eighteenth floor room. Bob Pierce, who was staying on the fifth floor, got out quickly. Schmidt wasn't so lucky.

"I heard people screaming and I saw people breaking windows. I looked down and could see that, yes, the casino was on fire." Schmidt tried to leave the room, but when she opened the door she couldn't see the room across the hall because of the smoke. She went back in her room, but did not break her windows because she saw the smoke climbing up the side of the hotel and right into rooms where guests had done just that.

With no real alternative, Schmidt just lay down and waited.

"I passed out several times. The firemen finally showed up at

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10:00 a.m." Schmidt was rushed to a hospital, but did not suffer any serious physical injury.

Nonetheless, coming so close to death left a mental scar as disquieting as any physical hurt. "It's taken a certain amount of adjusting. That experience is one reason why I left Quality early."

After taking a year off to settle her nerves, Schmidt returned to Quality in November 1982. Since then she has taken over the coordination of the firm's advertising and become involved with the editing of Quality's books. Schmidt is still winding down from the monumental task of putting together *Understanding the Apple II*—a technical book on the inner workings of the Apple II by Jim Sather.

Bobbing for Books. In addition to *Beneath Apple ProDOS*, Quality's future book titles will include *Understanding the IIe* by Jim Sather and *The Other Epson Manual* by Bill Parker. Parker's book—which includes information on the FX-80—is a completely new version of his popular alternative Epson manual. Also, Pierce says work has begun on a spreadsheet book by Jeffrey Jacques that will address users of such popular spreadsheet programs as *VisiCalc* and *Magicalc*.

Quality has three Apple software products in the works. *Return of Heracles* is an adventure game originally written for the Atari computers and is due out this spring. Also, a bridge game by Thomas Troop called *Bridge Baron* should be released by early summer. A utility called *Universal File Conversion*, which addresses four different operating systems, will be published this summer.

"We have no Macintosh projects going right now, but we're convinced it'll be a good seller," says Pierce. While both Lechner and Worth are impressed with Apple's new machine, they're content for the moment to see how the market for Macintosh develops.

Quality is working on software conversions for Atarisoft, and the arcade game *Battlezone* is currently being readied for the Apple. Quality has already finished *Ms. Pac-Man* for the IBM PC.

Valley Bobs. Quality Software recently moved into new quarters on the western fringe of the San Fernando Valley. Christiansen and Pierce seem comfortable and at ease, not about to start jumping through hoops to please the marketplace. Pierce feels the company could stand to be a little bigger to achieve greater efficiency. But both partners are confident that small companies like theirs will continue to be important factors in the software industry.

"Think of the economy ten or fifteen years ago," muses Bob Pierce. "The only outlet for creative energy in an individual was to write a book. Now there's a different way individuals can devote their energy and talent and produce something people will want to use. It doesn't always take big capital to produce good software.

"The industrial revolution brought people into factories," Pierce continues. "But I think factories are the wrong approach for software. It's hard to find team efforts that work really well. Large companies have the center of the market, but there is still a tremendous amount of room for exciting, innovative stuff."

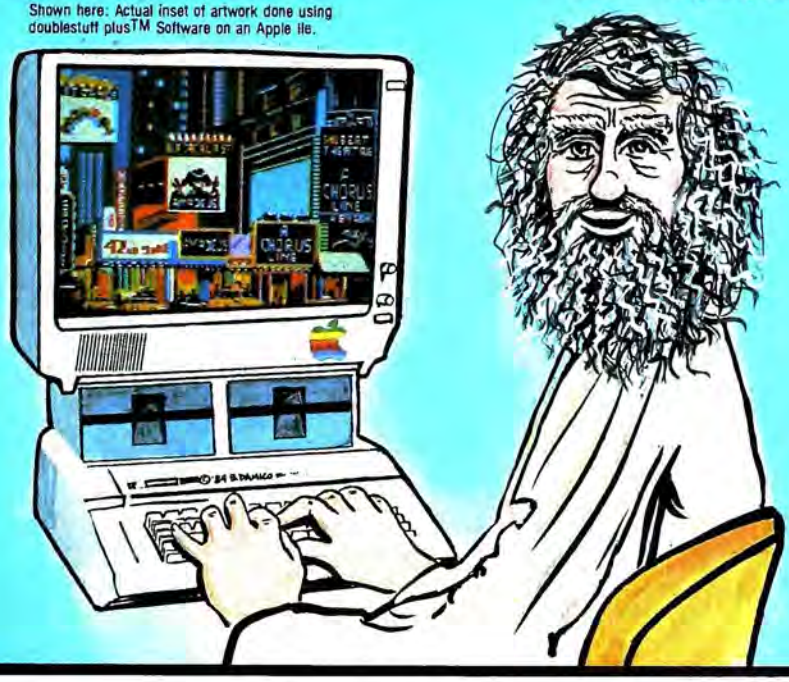
One scenario that has been played over and over in the ongoing drama of the software industry is that of one or two technically oriented professionals breathing the intoxicating fumes of microcomputer revolution and jumping into the fire. Another common scenario which, usually follows on the heels of the first, is that of a small company's early successes leading the founders to believe they have the golden touch—that they can compete in many different markets, even if they have to "buy" the required expertise.

"It's hard enough to do a good job on stuff you like," says Pierce about the frequent temptations to steer Quality into untested waters. "We tend to gravitate toward things we like."

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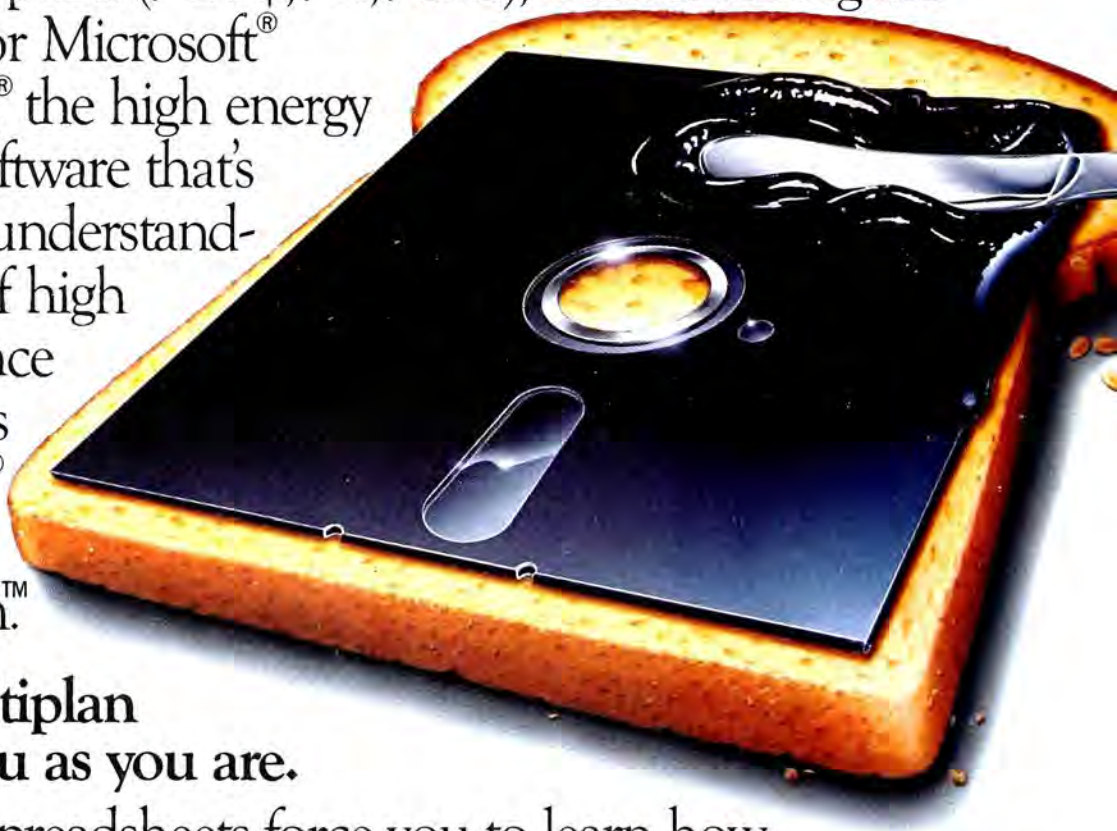
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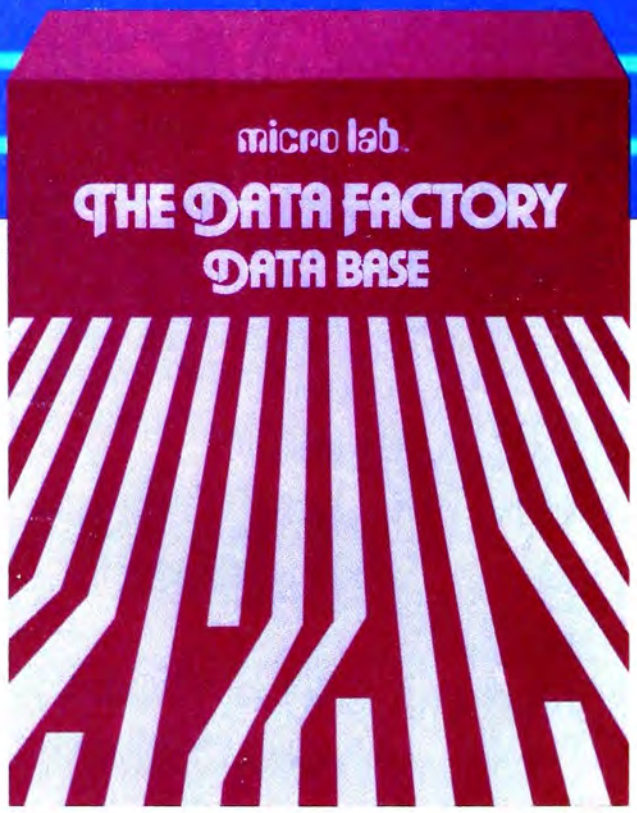
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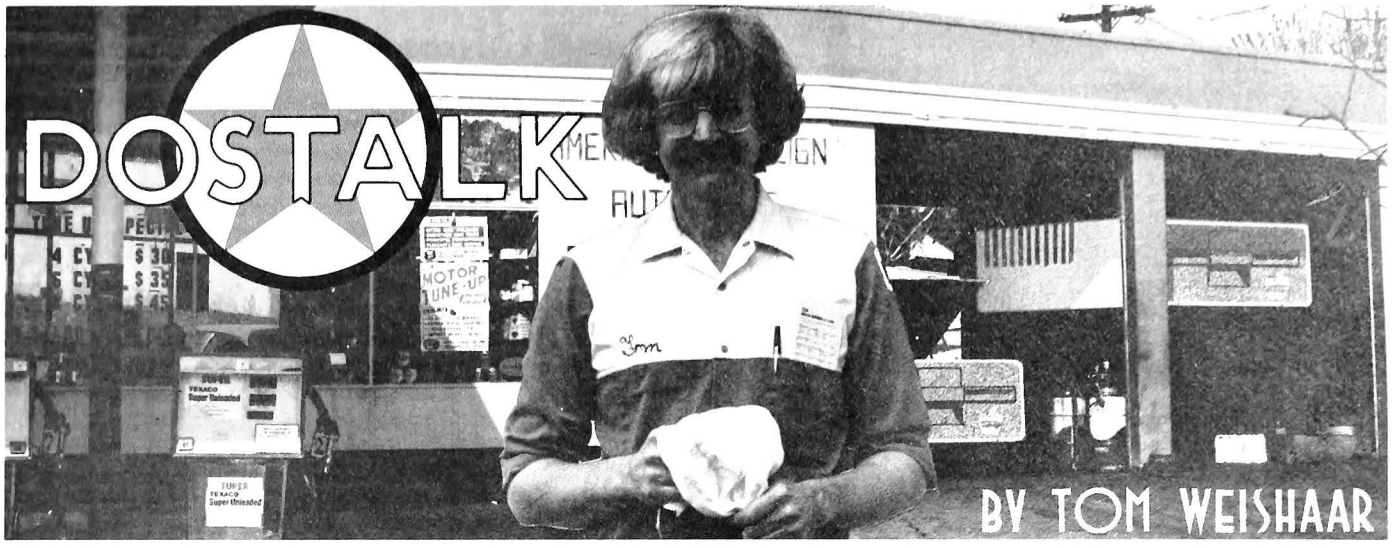
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Uncle DOS Plays God

Artificial intelligence has our vote for the most interesting area of computer work. This month DOStalk presents a new, public-domain artificial intelligence program, written in Applesoft, that you can use to give your own computer some humanlike qualities. Later in the column we'll discuss something that's really, rather than artificially, intelligent—when to use a word processor as a database manager.

People argue a lot about artificial intelligence. At one extreme are the anthropocentrics. Just as an ethnocentric believes in the innate superiority of the way things are done in his or her home town, an anthropocentric believes in the innate superiority of the human race. Machines will never be able to duplicate the feats of the human mind, they say.

At the other extreme are the "mitologists." These folks compare humans to mitochondria, which are little beasts that live inside our cells. Without mitochondria we would be unable to convert food into energy. Yet they are independent creatures, with DNA and RNA quite different from our own. In a similar way, say the mitologists, the manifest destiny of humans is to convert silicon into intelligence.

Uncle DOS Is a Mitologist. Here at DOStalk we feel more comfortable with the mitologists. The anthropocentrics have a tendency to lash out at anyone who attributes human qualities to a computer or computer program. Since we find characters with human qualities in our computers all the time—good friends like Uncle DOS and the Captain—these people scare us.

However, they do score points with some of their examples of the problems with machine intelligence. One of their best goes like this—how long would it take you to answer a friend who asked, "What day of the week was George Washington born on?" Most humans can answer this question in a split second. They immediately realize they don't know the answer and say so. Computers with any intelligence at all, on the other hand, go check through all their data banks, which may take from a few seconds to a few days, before coming back with the same answer—they don't know either.

In order to prove that this problem is not insurmountable, we have developed the following demonstration Artificial Intelligence Program (AIP). This program is designed to communicate and interact in a completely natural and humanlike way. Because of a limited amount of time, however, we have thus far only been able to raise the intelligence of the program to that of a two-year-old. Nonetheless, those of you who have recent experience with two-year-olds will immediately recognize the program's incredible ability to reflect the reasoning ability of young human minds.

```
10  REM  **----------**
11  REM  **          DOSTALK AIP          **
12  REM  **   ARTIFICIAL INTELLIGENCE PROGRAM   **
13  REM  **            APRIL 1984            **
14  REM  **----------**
40    FOR I=1 TO 8 : READ Q$(I) : NEXT
45    DATA LIST, CATALOG, WHY, BECAUSE, HUG, RUN,
      HOME, NEW
50    FOR I=1 TO 8 : READ A$(I) : NEXT
55    DATA TICKLE ME., I WANT TO GO OUTSIDE., I NEED A
      BAND-AID., CAN I HAVE A COOKIE?, WHY?, I
      DROPPED MY MILK., THERE'S A MONSTER
      IN MY BEDROOM., YOU SMELL FUNNY.
60    FOR I=1 TO 8 : READ B$(I) : NEXT
65    DATA GET DRESSED., PLAY THAT., EAT THAT., GET IN
      THE CAR., PUT MY SHOES ON., TAKE A
      BATH., GO POTTY., GO TO BED.
100   REM ** GET INSTRUCTIONS FROM KEYBOARD **
110   GOSUB 1000 : C=0
120   FOR I=1 TO 8
130   IF LEFT$(C$,3)=LEFT$(Q$(I),3) THEN C=I : I=8
140   NEXT
150   REM ** ANSWER UNINTELLIGIBLE INSTRUCTIONS **
160   IF C>0 THEN 200
170   PRINT "I DON'T WANT TO ";B$(R)
180   GOTO 100
200   REM ** ANSWER INTELLIGIBLE INSTRUCTIONS **
210   ON C GOTO 400,500,600,700,800
220   PRINT A$(R)
230   ON R GOTO 250, 275
240   GOTO 100
250   A2$="AGAIN." : GOTO 300
275   REM ** GO OUTSIDE **
285   A2$="I WANT TO COME INSIDE."
300   A1$=A$(R) : OLDR=R
310   GOSUB 1000
320   IF R=OLDR THEN 100
330   PRINT A2$
340   GOSUB 1000
350   IF R=OLDR THEN 100
360   PRINT A1$
370   GOTO 310
400   REM * LIST *
410   FOR I=1 TO 8
420   PRINT SPC(3),A$(I)
430   NEXT
440   GOTO 100
500   REM * CATALOG *
510   PRINT : PRINT "DISK VOLUME 002"
520   PRINT
530   FOR I=1 TO 8
540   PRINT "*A 00",R," I DON'T WANT TO ";B$(I)
550   NEXT
560   GOTO 100
600   REM * WHY *
610   PRINT "BECAUSE I WANT TO!"
620   GOTO 100
700   REM * BECAUSE *
710   PRINT "BECAUSE WHY?"
720   GOTO 100
800   REM * HUG *
810   PRINT "GOOD NIGHT, FOO-FOO."
```

```
 830    END
1000    REM ** INTELLIGENT INPUT ROUTINE **
1010    PRINT : INPUT "]";C$
1020    IF LEN(C$)=0 THEN PRINT "NO!" : GOTO 1000
1030    R=INT( (PEEK(78)/32) + 1)
1040    RETURN
```

A few words of explanation are in order. The key to the program is the subroutine at lines 1000 through 1040. This subroutine prints a right bracket (]) on the screen and asks for input. It looks just like an Applesoft prompt. When you run this program, nothing will *appear* to happen. But your computer now has all the reasoning ability of a two-year-old.

In line 1020 the subroutine checks to see if anything was entered. If the user simply presses return without entering anything else, the routine automatically responds with "No!" and returns for more input. So like a two-year-old.

The real magic, however, occurs in line 1030. This line picks a random number between 1 and 8 that will determine the response our program will give to the user's input. Random response is also quite typical of two-year-olds.

Some Random Words on Random Number Generation. Rather than use the Applesoft *RND* function, AIP uses a separate but less well-known means of generating random numbers. While RND probably would have worked well enough for AIP, you wouldn't have learned anything new, and what kind of fun is that?

If you do programming that requires truly random numbers, such as games or simulation studies, you should know that Applesoft's random number generator has a few bugs in it. You can prove it to yourself with the following little program:

```
10 HGR : HCOLOR=3 : POKE 49234,0
20 HPLOT RND(1)*280, RND(1)*192 : GOTO 20
```

This program puts "random" dots on your hi-res screen. Eventually the entire screen should turn white. But it doesn't. After running a few minutes, no more new dots appear. It means RND has started to repeat the same sequence of not-so-random numbers.

For a complete discussion of this problem and a proper solution, see "RND Is Fatally Flawed," by David Sparks and "A New Pseudo-Random Number Generator," by Tom Hare, John Russ, and Gary Faulkner in the January 1983 *Call −A.P.P.L.E.* For an alternative solution built right into the Apple's operating system, keep reading.

Whenever you have a cursor on your screen and your Apple is waiting for you to press a key, it twiddles its thumbs. This thumb-twiddling causes the values stored in bytes 78 and 79 (in hexadecimal that's $4E and $4F) to change extremely rapidly. When you actually press a key the thumb-twiddling stops, and these bytes hold values that are about as random as random can get.

The *peek(78)* in AIP's line 1030 picks up one of these numbers, which can be anything between 0 and 255. When we divide this number by 32, add 1, and use Applesoft's integer function on the result, we come up with a random integer between 1 and 8, inclusive.

There are two limitations to this technique. The following program demonstrates them both:

```
10 HGR : HCOLOR=3 : POKE 49234,0
20 GET A$
30 HPLOT PEEK(78), PEEK(79)/2 : GOTO 20
```

The first limitation is that only a few ranges of numbers are available. You can't, for example, get a perfectly random number between 1 and 6. This is because the number of different random values available (256) can't be evenly split into six groups. You're left with ranges of 2, 4, 8, 16, 32, 64, 128, or 256 (sound familiar?) numbers. Thus our sample program can't fill in the entire hi-res screen, but only the portion between coordinates 0,0 and 255,127.

The second limitation is that somebody has to press a key every time you need a new random number. Since 32,768 keypresses would be required to turn this portion of the screen white *without* random numbers, final testing of the program is incomplete. If you would like to help, simply count the number of keypresses required to fill in the screen, write your answer on a post card, and send it to Matt Yuen, Head Random Number Generator Tester, in care of this magazine. (Note: Using the Apple's repeat-key feature will generate nonrandom numbers and is not allowed.)

Fortunately, neither the range nor the keypress limitation is a problem for AIP.

Only Exit For-Next at Next. AIP begins by loading some string arrays with instructions a typical user might type on an Apple displaying an Applesoft prompt and with responses typical of two-year-olds.

Next lines 100 to 140 get the user's instructions. First comes a call on our "intelligent" input routine, which collects the user's input in C$ and chooses a random number for R. Lines 120 to 140 compare the first three characters of our user's input with the first three characters of the strings in the Q$ array (see line 45). If a match is found in line 130, then the variable C is set to indicate which of the strings was found, and we exit the for-next loop.

You may learn something new if you study how the exit from the for-next loop was accomplished. You should use this technique whenever an *if* statement may cause an exit from a loop. Here's the wrong way to do it:

```
120 FOR C=1 TO 8
130 IF LEFT$(C$,3)=LEFT$(Q$(C),3) THEN 160
140 NEXT
160 IF C<9 THEN 200
```

This may seem much simpler at first. If a match is found, C will indicate which string was found. If we get to line 160 and C equals 9, then we know nothing matched.

The problem with exiting from the middle of a loop like this is that we leave Applesoft expecting a next that never comes. When we execute these lines (or any other loop using C as the index variable) again, Applesoft will resolve the problem. But if you sequentially exit from the middle of eleven loops with different index variables, Applesoft expires with a nasty *out of memory* error. Try it!

The solution to the problem is to exit the loop properly. AIP does this in line 130 by setting the loop's index variable (I) to its maximum value (8). Thus, when the *next* statement in line 140 is encountered, Applesoft will exit the loop and fall through to the next statement (line 160).

Line 160 looks to see if a match was found (C is set to zero in line 110 and left there if there are no matches). If there was a match, execution continues at line 200. In the quite likely event that no match was found, line 170 uses our random number to select a response from the B$ array (line 65). Then the line sticks an "I don't want to" onto the front of the chosen response and prints it. After that we go back to line 100 for more input.

If the user's input was recognized, lines 200 to 830 use *on goto* statements to select an appropriate response. When the user enters the word "hug," the program says good night and goes to bed. AIP's no fool.

Database Processing. If you ignore random digressions such as last month's discussion of disk free space, 1984 is shaping up as the Year of the Text File here at DOStalk. Text files are used to store data—your work. Since data storage is one of the primary reasons most people have for buying a computer in the first place, text files are pretty important.

When you find yourself in the situation of being the proud owner of both an Apple and some data that could be filed away in computerized form, lock your checkbook and credit cards in the safe-deposit box, sit yourself down, and do some serious thinking.

You have three choices: *Write* a database program that fits your needs, *buy* a database program that fits your needs, or *use* a program you already have that fits your needs.

Only the Needy Need Buy. What are your needs? Are you driven by the fact that you have a *computer* and you want to use it for something? Or are you driven by the fact that you have some *data* and you want to use it for something? The difference is subtle but extremely important.

Is your data *already organized*? If not, the task ahead of you is massive. Moving data from a well-organized paper-based system to a computer is far easier than collecting and organizing the data to begin with, whether you put it in your computer or not.

Does your data have a lot of *inherent structure*? For example, a library's "card catalog" consists of thousands of index cards. In database language, the entire card catalog would be called a *file*. Each of the cards holds relevant information about one book in the library. In database language, each card is a *record*. The information on the cards is stored in a standardized format. Every card includes the book's title, author, year of publication, and so on. In database language, each of these items is a *field*.

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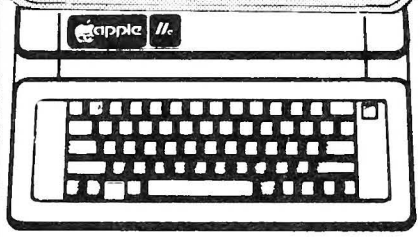
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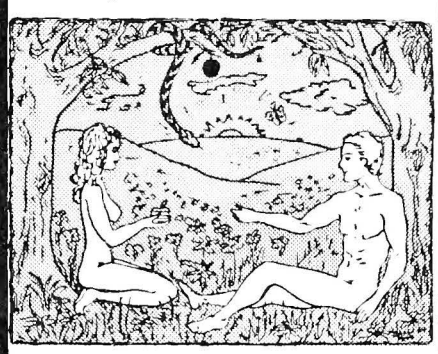
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or a computerized stock portfolio—allows you to quickly *see* any card or record in the file. This is great if your data can be organized into records and fields. But lots of information *can't be organized this way*. Neither an encyclopedia nor an Applesoft tutorial, for example, can be usefully organized in a record/field format.

In addition to *seeing* each record, database programs also allow you to *add* records, *modify* records, and *delete* records. These four functions are the foundation of any database system.

Further powers you will find in many systems are the ability to *select* specific records, to *sort* the records, and to *summarize* the records in printed reports. Which, if any, of these capabilities do you need?

Perseveration and the Floppy Barrier. Last December, DOStalk broke the story of the Computer Perseveration Syndrome. If you feel a need to create an electronic catalog of your book, butterfly, or recipe collection, you may have this disorder. Most of us *spend* far more time creating a database like this than we ever *save* using it. On the other hand, if you actually do have enough books, butterflies, or recipes to justify an electronic catalog, you probably have more than will reasonably fit on today's typical Apple.

The usefulness of personal computer databases is severely limited by the capacity of a floppy disk. A standard ProDOS thirty-five-track disk can hold a file with 138,240 characters of information. The biggest file you can get on a DOS 3.3 disk will hold 133,888 characters—and you have to remove DOS from the disk to get that many. Depending on how many characters you want to allocate to each book or recipe, the maximum number of entries you can keep on a single disk is shown in the accompanying table.

Size of Each Entry		Maximum Number of Entries Per Disk	
Characters	Words	DOS 3.3	ProDOS
30	5	4,462	4,608
60	10	2,231	2,304
150	25	892	921
300	50	446	460
600	100	223	230

Data Storage Limits for Floppy Disks.

Here you see the catch-22 of personal computer databases. If you design a database with enough *different* entries to be useful, each entry is so small it's useless. On the other hand, if you make the individual entries large enough to be useful, the maximum number of entries quickly drops below what's needed for many applications.

One way around this problem is to use more than one disk. But this greatly increases the complexity of both designing and *using* the program. Another solution is to use higher-capacity disk drives. As time passes and these devices become less expensive, this will be the best solution. Right now, however, the price of high-capacity drives is a little steep for recipe collections.

Now that you are beginning to have a feel for the difficulty of managing databases, you must be wondering how Apple ever managed to sell so many Apple IIs. How, you might ask, do at least a couple of database programs show up on *Softalk*'s Top Thirty every month?

Well, there are *some* applications that have no problem with the limitations of small floppy disks. Small business payrolls, accounts payable, and accounts receivable immediately jump to mind. In these applications the total number of entries in any given month is less than 200; keeping the entries on a computer saves people time because, unlike your recipe collection, the information is constantly changing. Another example of data that can be easily managed on Apples is a mailing list too small to put on a bigger computer but too large to handle by hand—100 to 1,200 names.

Now, let's ask the central question again. What are *your* needs? Do you have some data that can be kept up to date more efficiently by storing it on an Apple? Is the amount of data limited; is it already collected and organized; is it structured in records and fields? Do you need to be able to sort the data and summarize it in printed reports? If you can answer yes to *all* of these questions, unlock your checkbook and go *buy* a database program; you are excused from reading the rest of this column.

The Word Processor Connection. If you can't answer yes to all of the above questions, an alternative solution may be to store your data in a word processor's files. This won't help much if your data is a ten-thousand-name mailing list, or if your data has to be sorted seven ways from Sunday, or if what you really want is automatic computerized summaries of the data.

But if your data can't be structured easily or if it isn't collected and organized yet, a word processor is a far better solution to your needs than a traditional database program.

A word processor gives you all the fundamental capabilities needed to store data. You can *see* the information, you can *add* to it, you can *modify* it, and you can *delete* parts of it.

While you can't *sort* or automatically *summarize* the data in reports, you can, using the *string search* function available on most word processors, quickly *select* or find any information that is of interest to you. Note that this will be a *full-text* search, too—every word in the file will be scanned. With most database programs, on the other hand, searches are limited to the data in a *single field*.

If you like, you can use a record/field structure to organize your word processor-based data. But you aren't *forced* to. If what you're saving is facts about the French Revolution, a record/field structure may be totally inappropriate.

If you do decide to use a record/field structure, one of the great advantages of using a word processor is that you aren't locked into the one you start with. With a standard database program, it can be hard or impossible to change the structure once it has been defined. Say, for example, you store the names, addresses, and telephone numbers of all your acquaintances using a standard database program. After entering this information and using it for a month, you may realize it would be helpful to store the birthdays of a few friends as well.

With a word processor, you just do it. New fields and new records can be added anywhere. With standard database programs, on the other hand, adding a new field may be out of the question.

Saves Space Too. Not only does a word processor allow you to add new fields and records anywhere, they can all be different sizes. With standard database programs, each field and record usually has a fixed length. If your friend's address is longer than the allotted field, you must abbreviate it. If the address is shorter than the field, the extra characters are "wasted" space on your disk. With some programs, *every* record uses as much disk space as the *largest* record. This can waste lots of space quickly—even though, as we have seen, there's usually not a byte to spare.

With a word processor, on the other hand, file structure is free-form. Records and fields can use as much space as needed, and no space is ever wasted. If you are collecting information and organizing it at the same time, a word processor is often the best software to start with because it allows you to make exceptions to record/field rules or to revise them as often as necessary. Only after you have collected a significant portion of the data, organized it, and convinced yourself that it is compatible with a traditional database program should you move it over to one.

Storing information with a word processor rather than a database program is not always a viable alternative, but in many cases it is—in some cases it even works better. If you don't yet have a word processor but you're interested in this technique, you may now unlock your checkbook and go buy one. Make sure the one you buy has a string-search function.

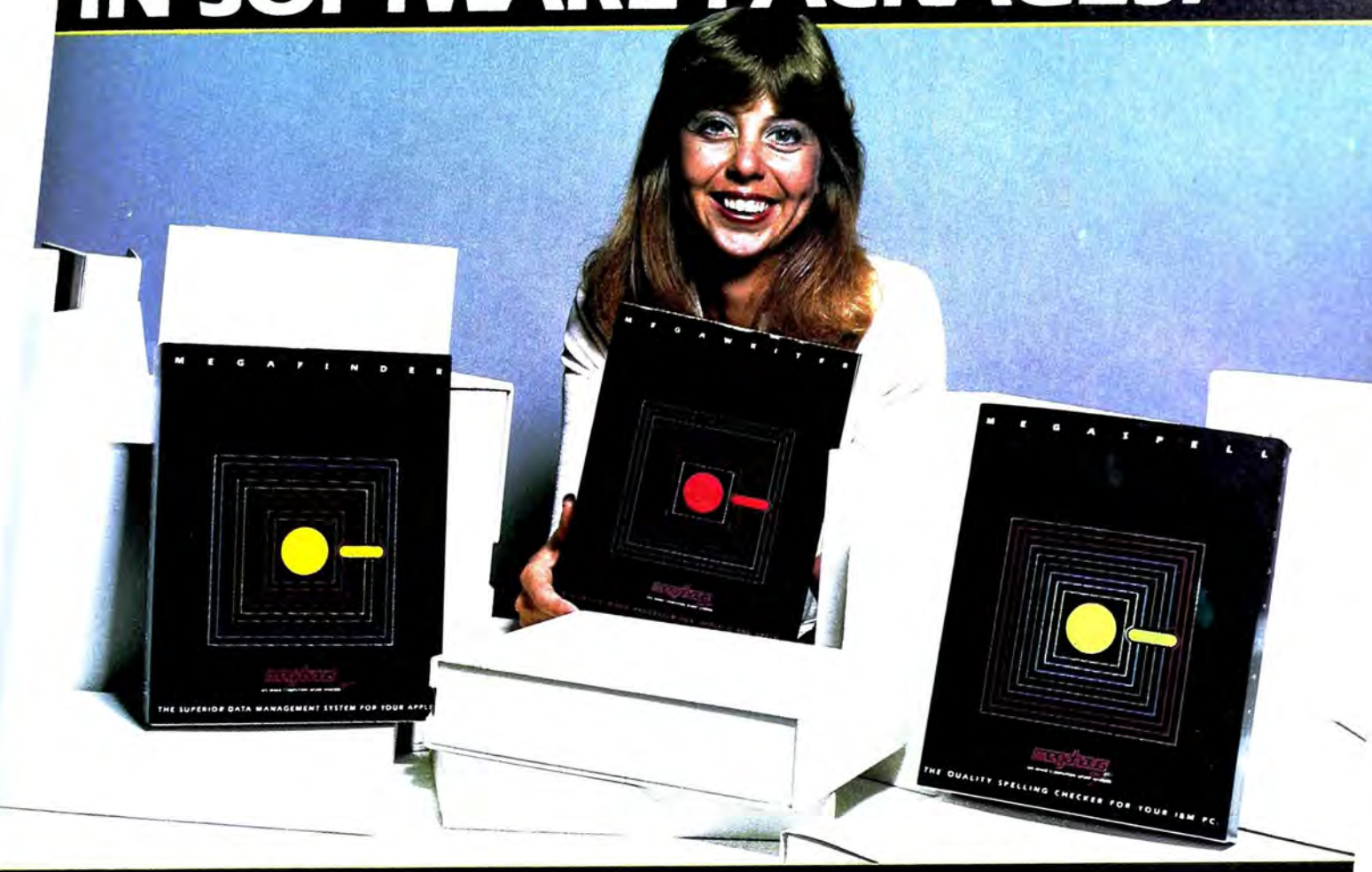
Also take careful note of how large a file the word processor can access. It will almost certainly be smaller than 130,000 characters. But word processors that can handle files of 25,000 characters or more are readily available; use that for a standard. Finally, it will be helpful in the future if your word processor saves your work in text files. That way your data will be accessible to programs you write yourself.

Moving Write Along. At the beginning of this discussion, we asked you whether you were attracted to computerized information storage because you have a computer you want to use for something or because you have information you want to use for something. We've now taken care of all the data-driven people.

If you're still reading, we can only assume that you, on the other hand, have a computer that you'd like to use for something. If so, just leave your checkbook in the safe-deposit box (where it will be write-protected). If you take it out now, there's a serious chance your accumulated wealth will pass through that slot on the front of your disk drive. Don't do it.

Instead, just keep reading DOStalk. In the coming months, we'll help you with various tips on how to *write* database programs. There's nothing wrong with storing the secrets of your butterfly collection in your computer if you're just doing it for *fun*. Long live the Computer Perseveration Syndrome! ◨

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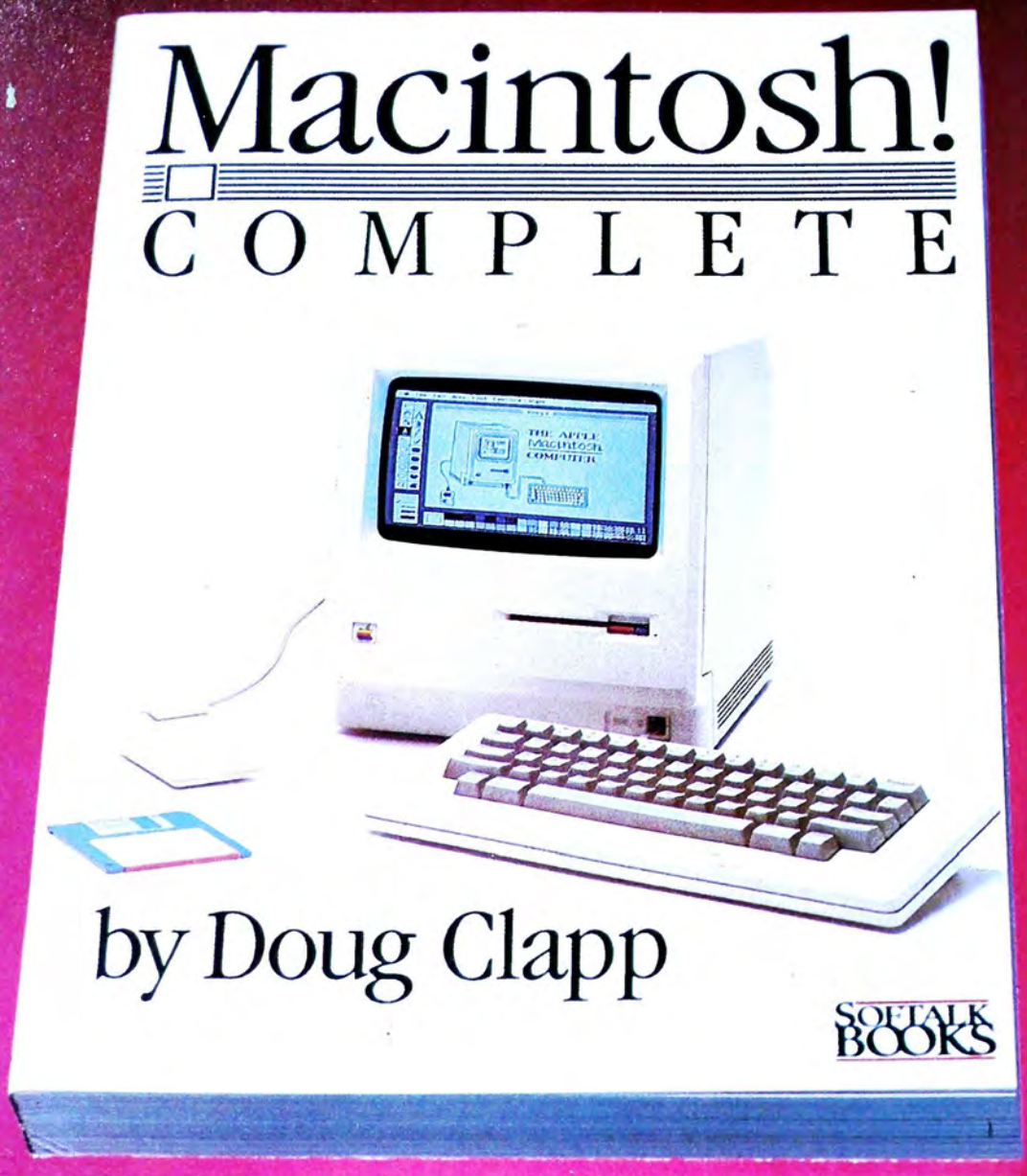
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Winning on Wall Street Reviewed.

Last time we looked at *Trader's Data Manager*, which is one-third of Summa Software Corporation's *Winning on Wall Street* series. This time we'll examine the remaining two-thirds of the package—*Trader's Forecaster* and *Trader's Accountant*.

Winning on Wall Street, Summa Software Corporation (7885 S.W. Cirrus Drive, Building 25, Beaverton, OR 97005; 503-644-3212).
Trader's Forecaster: $250; *Trader's Accountant*: $350; complete system (with *Trader's Data Manager*): $700.
Backup policy: Backups available from Summa Software for a minimal charge.
System requirements: 48K Apple II, II Plus, or IIe with 16K RAM card, two disk drives, eighty-column printer.
Optional: Grappler+ or compatible interface (recommended), D. C. Hayes Micromodem II.

Summa Software has paid special attention to the menu design, program operation, and user interface of all three *Winning on Wall Street* modules. The result is a series that's easy for investors to learn and use.

Let's look first at *Trader's Forecaster*. This module brings together technical and classical analysis tools, a point and figure charting routine, and a proprietary analysis technique known as the "matrix projection formula." The forecasting module must be used in conjunction with the *Trader's Data Manager*, since the historical quote information stored on *Data Manager* is what *Forecaster* uses in its analysis.

All analysis done by *Trader's Forecaster*, with the exception of that performed by the proprietary tool, is presented graphically. The "forecasting" techniques the program incorporates are moving averages, exponential smoothing, adaptive filtering, and least squares fit (regression analysis). Many investors would argue that these techniques are technical analysis tools, not forecasting tools as the documentation labels them. No matter; they work the same way no matter what you call them.

The point and figure chart and the proprietary formula are on the main menu. The other options the program provides are accessed via the graphic display screens.

To begin working with any of the analysis tools, the user must enter the period of time the analysis is to cover, the type of graph (choices here are the same as those in *Trader's Data Manager*), and the stock code. *Trader's Forecaster* responds by retrieving the necessary information from disk and building the graph. Because of space limitations on-screen, the program can graph no more than ninety data points (which can represent daily, weekly, monthly, quarterly, or yearly data) at a time.

As you'll recall from last month, the *Trader's Data Manager* module has the wand, display, graph, print, vertical, horizontal, erase, and quit commands. These commands are also incorporated into *Trader's Forecaster*, along with four new ones: *left*, *right*, *forecast*, and *tool*. These new commands provide access to either the forecasting menu or the technical analysis tools menu and the means to specify time boundaries for the analysis. The investor can analyze the entire time period selected earlier or use the left and right commands to zoom in on a selected part of a chart.

Last month we described how the interactive keys at the bottom of the *Trader's Data Manager* screen work; this month let's spend our time exploring the theory underlying a few of the techniques used in *Trader's Forecaster*.

As we've discussed before, moving averages are used to smooth out graphs in order to make them easier to read and more meaningful. In a moving average, all data is weighted equally. An event that happened ten, twenty, or thirty days ago has the same impact on an average as something that happened yesterday. Constructing an index or average that gives more weight to recent information is done by means of a technique known as exponential smoothing. This technique requires that the investor choose the calculation's weighing measurement, which is known as the alpha factor.

The more volatile a security, the more heavily you'd want to weight the most recent information (and the higher the alpha factor you'd specify). The less volatile the security, the more equally you'd want to weight the information (and the lower the alpha factor would be). The alpha factor can range between 0 and 1; 0 places a weight (or significance) of 0 percent on the last data point, while 1 weights the last data point at 100 percent. If you're good at picking the alpha factors, the resulting smoothed average or index can be a valuable tool for isolating turning points in the market.

Another technique available in *Trader's Forecaster* is adaptive filtering. The term comes from, of all places, the telephone industry, and it refers to a method of filtering noises out of a telephone signal. The analytical technique used in *Winning on Wall Street* does much the same thing—it filters out "noise" (extraneous information) surrounding a security's movement. The basis of this technique is a comparison of past predictions generated by the technique against their actual values. The residual data, or variance, is then used to calculate a weighting factor, which is in turn used to average the data. Because these variances are analyzed by means of an iterative process, the more data you have, the better. But as the amount of data increases, so does the number of calculations, as well as the time required to perform them. To prevent the computer from running forever, *Trader's Forecaster* automatically computes the optimum number of iterations.

Adaptive filtering can yield more accurate information than either straight moving averages or exponential smoothing, especially when the security whose performance you're evaluating has very complex behavior patterns. Adaptive filtering is a valuable technique, and this is the first investment software we've looked at that has it.

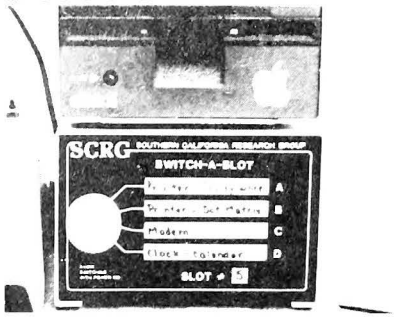
The least-squares-fit method is nothing more than a standard linear regression model. Linear regression is used to analyze a security's trends or cycles. To learn more about this technique, refer to any basic statistics text or technical analysis handbook.

According to the *Winning on Wall Street* documentation, the matrix projection formula "generates a highly accurate trend line on the daily highs and lows (of a security) around which it constructs trading bands (standard deviations). The area between the trading bands is called the trading channel. Predictions of prices that fall below the lower boundary, called the next low, signal that the time may be right to buy those particu-

SCRG

NEW PRODUCT

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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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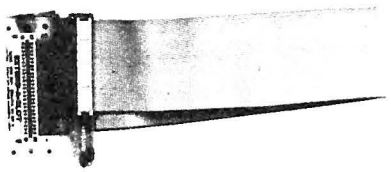
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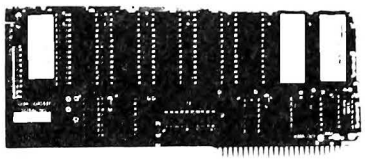
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quikLoader



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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.

CONVENIENCE

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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SYSTEM REQUIREMENTS

The quikLoader plugs into any slot of the APPLE] [+ or //e. If used in a] [+, a slightly modified 16K memory card is required in slot 0. A disk drive is required to save data.

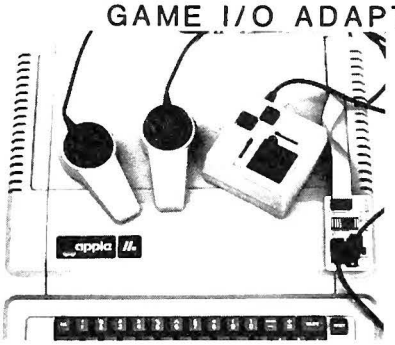
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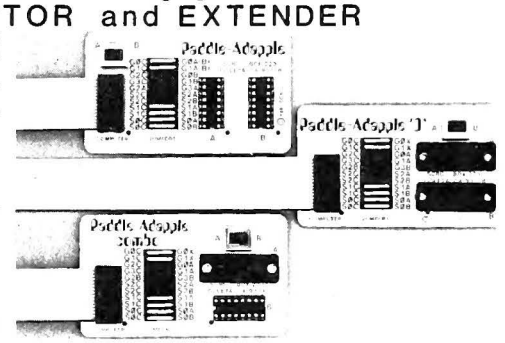
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lar stocks. Price predictions exceeding the upper limits, called the next high, may suggest that it's time to sell." The documentation goes on to say that some people find the matrix projection formula "extremely useful in short-term trading" and that although it's a very accurate method, it won't predict "extraordinary events or outside influences, which can cause major deviations from past performance of a particular stock."

This formula did indeed perform well during our testing period, but because it can easily be misinterpreted, we hesitate to recommend it as a tool for any but the most sophisticated investors. Also, it's distressing that the algorithm for the technique is not included in the documentation. In past columns, we've condemned "black box" investment techniques, and the matrix projection formula comes close to looking like one of these.

Trader's Forecaster considers all the techniques we've discussed so far to be forecasting tools. It calls the next group of tools we'll look at technical analysis tools; they're accessible via the tool choice on the program's graphic display.

The first choice on the tool menu is 1/3-2/3 speed/resistance lines. This technique is useful to Dow theorists who wish to isolate the Dow signals we discussed in last month's tutorial. *Trader's Forecaster* first constructs a horizontal line at the beginning or end of a trend. The system then calculates and graphs diagonal lines that intersect points one-third and two-thirds of the distance between the base horizontal line and the peak or valley of the current stock activity.

The next technique we'll discuss is midchannel support/resistance lines. Trading channels are composed of straight lines. Securities usually fluctuate in price. The top boundary of these oscillations is called a resistance line, the bottom boundary a support line. On a graph, the resistance line looks as though it's deflating the price of the stock each time the stock's price approaches it, while the support line appears to be supporting the price of the stock. The area between these two lines is referred to as a channel. The midchannel line, then, is the high value plus the low value divided by two.

In *Trader's Forecaster*, channels can be constructed only for high, low, and close versus volume graphs. The support and resistance lines are constructed based on the standard deviation of the security's movement. Using the wand feature we described last month, you can construct a series of these channels that can quickly isolate patterns or cycles in a security's behavior. This is another analytical technique not normally found in investment software.

Trading bands are lines that track another indicator, but at an investor-specified difference above and below that indicator. In *Trader's Forecaster*, trading bands can only be used with moving average calculations. The "difference" must be specified in standard deviations.

As we've said many times, volume is an important technical signal. The volume indicators in *Trader's Forecaster* are as easy to use as the rest of the program, and they work very well.

Forecaster charts the following volume indicators: negative volume, cumulative volume, price-volume trend, and daily volume. (In a future tutorial section, we'll discuss how these various indicators are constructed.)

The last technical tool provided is another unique feature: point and figure charting capability. Point and figure charts are plotted based on a security's high, low, and closing volume. Technical traders use them to gauge a security's volatility. Plots are made vertically, with Xs representing an up trend in the security and boxes indicating a down trend (see the accompanying figure). As long as the security is moving in the same direction (up or down), the plot stays in the same column. When the trend shifts, *Trader's Forecaster* starts a new column and begins plotting one row below the previous high or low.

Many traders draw forty-five-degree lines on point and figure charts to aid them in judging the volatility of a particular stock. The "new row" printing convention makes this form of analysis easy to do. At the top of the screen, you'll notice two variables displayed—point per unit and unit reversal. These variables are specified by the investor for each point and figure chart.

Points (or dollars) per unit affect a chart's vertical axis. The smaller the denomination the investor chooses, the taller the graph. Adjusting the unit reversal variable allows the investor to specify how much of a price change ($2, $3, $5) is required to trigger a change in the graph (a new row).

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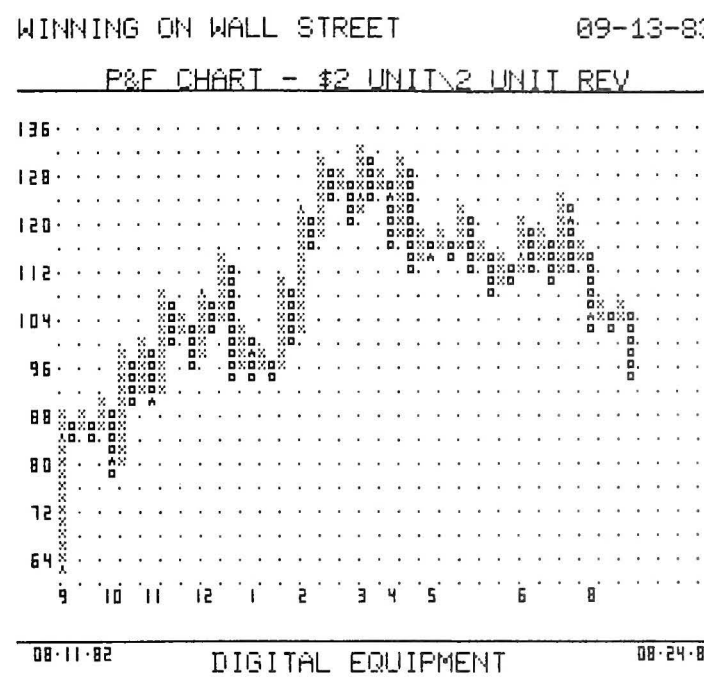
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Trader's Forecaster works very well. The one thing we'd like to see added to the program is a way to get a catalog of the securities stored on disk. If you don't remember what securities you've stored and the period of time for which you've stored them, the only way to find out is by going back into *Trader's Data Manager* for a listing. These two programs are provided on the same disk, so it would seem a simple matter to add a menu choice for this feature to *Forecaster*.



Point and figure chart for a security (Digital Equipment). Xs represent uptrends and boxes indicate downtrends.

Trader's Accountant. Let's look now at *Winning on Wall Street*'s portfolio module, *Trader's Accountant*. The menu conventions and operation of this program match those of the other two modules in this series; this means, of course, that an investor who has used some other element of the package doesn't have to learn a whole new set of conventions in order to work with this one.

Trader's Accountant can accommodate up to five portfolio accounts per disk, and up to 999 accounts can be put on the system. The investor must specify a number (from 001 to 999) for each portfolio. Unfortunately, even though you can store a description of a portfolio when you create it, none of the reports that the program generates relate the portfolio descriptions to the account numbers you've assigned.

Each portfolio file has three parts: the cash account, the margin account, and the stock files. The cash account is the pool of funds within the portfolio that's used to purchase securities at 100 percent of their purchase price. The investor may deposit or withdraw funds from this account, and these funds may earn interest.

The margin account tracks two sources to funds: the cash deposited into the main account to pay the nonmarginable portion of securities transactions, and the margin balance. When a security that's been on margin is sold, the margined portion is automatically repaid and the remaining money is deposited to the margin cash balance. If the sale of the security doesn't realize enough cash, the program withdraws funds from the margin account's cash balance. As is possible with cash account funds, money can be directly deposited or withdrawn from the margin account's cash balance, and these funds may earn interest. The margin percentage may be set between 0 and 50 percent.

Trader's Accountant won't automatically transfer cash between the cash and margin accounts. If you want to transfer funds, you must do so

manually.

The stock files within a portfolio store all the information concerning each security. *Trader's Accountant* differs slightly from most portfolio accounting programs in that a distinct stock file must be created by the investor for each security within the portfolio before any information on that security may be entered. Even though the files are referred to as "stock" files, *Accountant* can handle a diverse number of instruments including options, warrants rights, bonds, and so on.

Trader's Accountant can maintain one special fund account, called a liquid fund, per disk. The liquid fund account tracks the movement of liquid funds (cash in money market funds, savings accounts, checking accounts, and so on) to stock investments. Whereas the cash account for a portfolio affects only that portfolio, the liquid fund account can affect all portfolios on the disk. The liquid fund is a "master" fund that can feed cash into a portfolio or have deposits made to it directly from a portfolio.

This module tracks broker's fees and commissions. Some programs allow the installation of your broker's commission schedule and then automatically calculate the commission on a given transaction. This program takes a different approach, allowing you to enter the gross commission or transaction fee when you enter the stock transaction. It then stores that information and summarizes it in a number of its reports.

Trader's Accountant can track the various types of cash transactions you'd expect to post to a portfolio, such as dividends, interest earned, and interest paid. The program can also track the various types of cash transactions you'd generally post, such as dividends, interest earned, and interest paid.

Portfolios can be updated via Dow Jones News Retrieval (in much the same fashion as the database in *Trader's Data Manager* can) or via the keyboard. *Trader's Accountant* can also use files from *Data Manager* to update its pricing information. The investor does not have to update each program separately. Once *Data Manager* has been updated, bringing *Accountant* up to date is simply a matter of swapping a few disks in and out of the drives. It's fairly fast, and it's very easy to do.

One of the most noteworthy features of this series is *Trader's Accountant*'s simulation mode. This mode allows the investor to test the effects of various transactions on the health, tax position, and structure of the portfolios carried in *Trader's Accountant*. Simulated transactions don't affect actual transactions. The word "simulation" appears on the screen and on any reports generated while this mode is activated. The simulation feature is an outstanding aid to the investor who needs to plan tax liabilities and evaluate the effects of trades on a cash position.

As we've often said, a portfolio accounting system is only as good as the reports it produces. This accounting module gives you reports on stock transaction detail, liquid fund transactions, profit/loss-unrealized detail, profit/loss-unrealized summary, profit/loss-realized detail, profit/loss-realized summary, cash account transactions, and tax data/stock transactions. All reports cover an investor-defined period and are divided into account numbers (portfolios) by disk. There's no facility for summarizing information across disks, however.

The stock transaction detail report is an audit report by portfolio of all transactions posted to that portfolio. The transaction code (buy, sell long, sell short, buy to cover), transaction date, number of shares, price per share, total cost of shares, broker's fees, dollar amount of margin owned, percent of margin owed, and any memos recorded for the transaction (transfer transaction or stock split) are displayed on the report. The report is well formatted, clean, and easy to read.

The liquid fund report displays all transactions within the liquid fund, the date they occurred, whether they were a deposit or a withdrawal, and their effect on the balance of the fund.

The profit/loss-unrealized detail report shows the profit or loss on all open positions in the portfolio, including the margin owed (if any) and the equity in the position. The summary report is a recap of the detail report that consolidates all like-security positions (for example, two Apple positions) and computes the percent gain or loss on the combined positions.

The profit/loss-realized detail report and the profit/loss-realized summary report are the counterparts to the realized gain/loss reports for the closed positions. The major difference is that in these two reports the margin-owed computation is now a margin-paid figure, the stock value is now the stock's sale price, fees for the closing transaction are carried, and the net gain for closing the position is calculated.

The cash and margin account reports show the activity for these two accounts, carrying the detail of each transaction, its nature (deposit or withdrawal), the date of the transaction, and the account balance. The cash report also reflects the taxable nature of the transaction code (D for dividend, P for interest paid, E for interest earned, B for buy, S for sell short, C for buy to cover, L for sell long), while the margin report shows what type of transaction occurred, using the same transaction codes as the cash report.

The tax report lists all taxable transactions that have taken place within the portfolio. The particulars of each transaction, the nature of the gain or loss, and a recap of interest earned, interest paid, and dividend income are all displayed. *Trader's Forecaster* is also the first program we know of that has the ability to track earned but not yet collected income. The program indicates whether the gain is long- or short-term, but it doesn't compute the overall short- or long-term loss or gain on the portfolio. A program this sophisticated really should make those calculations.

Because *Trader's Accountant* handles all transactions similarly and doesn't have entry screens specially designed for warrants, options, and so on, it can't track due dates or expiration dates for these types of instruments. One of the advantages of a computer is that it can track dates well; we'd like to see some form of built-in notification system in *Trader's Accountant* that would keep track of important dates for each security. Also, it would be nice to have an overall portfolio net gain calculation with the individual security net gain calculations.

What can you say when you've just seen a package that's clearly state of the art? *Winning on Wall Street* is an exciting series of programs that can be a tremendous asset to any investor. It's not inexpensive, but it's not expensive for what it does. And it's not for everybody, but it could be. So if you're serious about investing, ask your dealer for a *Winning on Wall Street* demonstration. You have nothing to lose and everything to gain. ■

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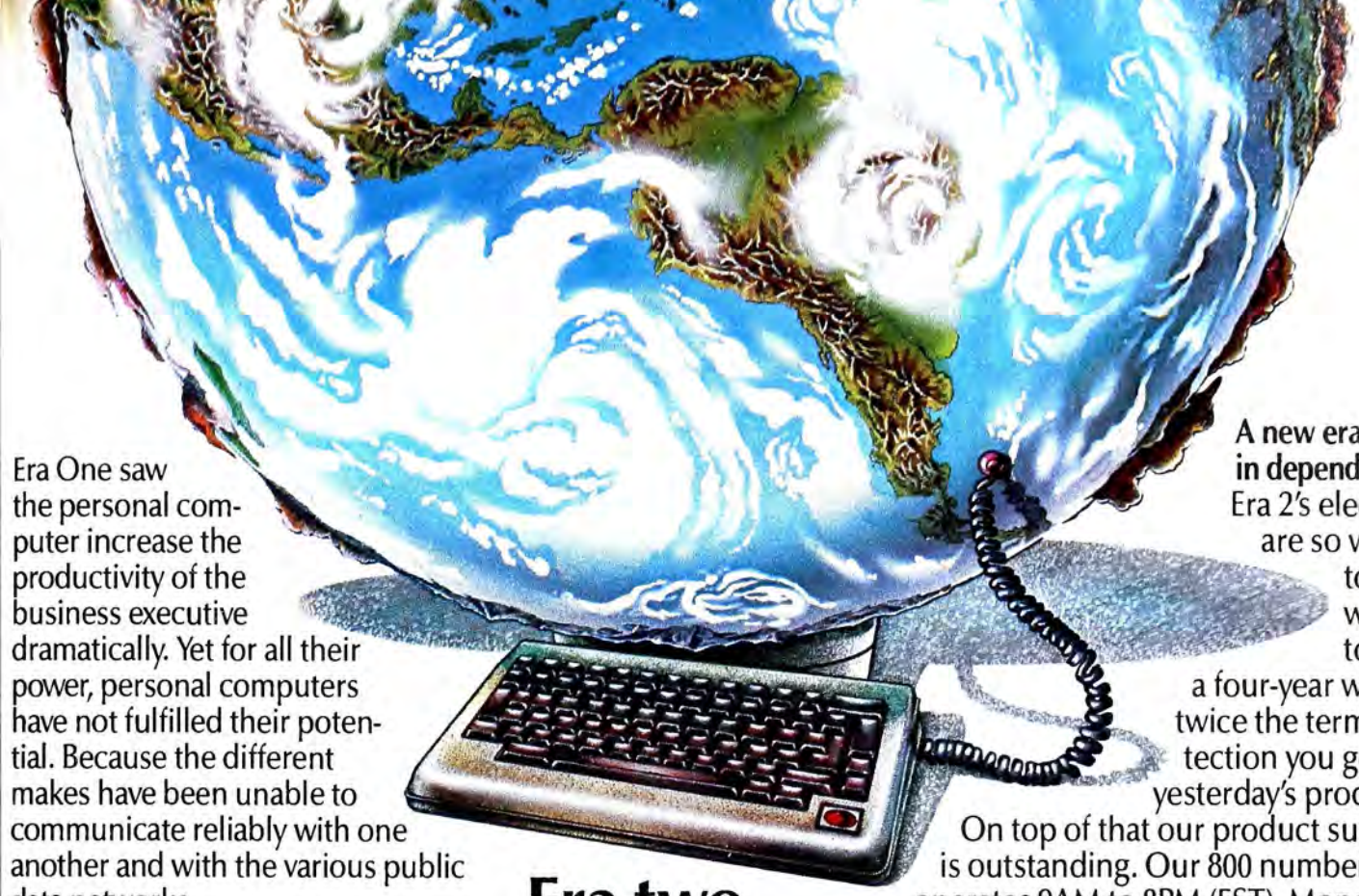
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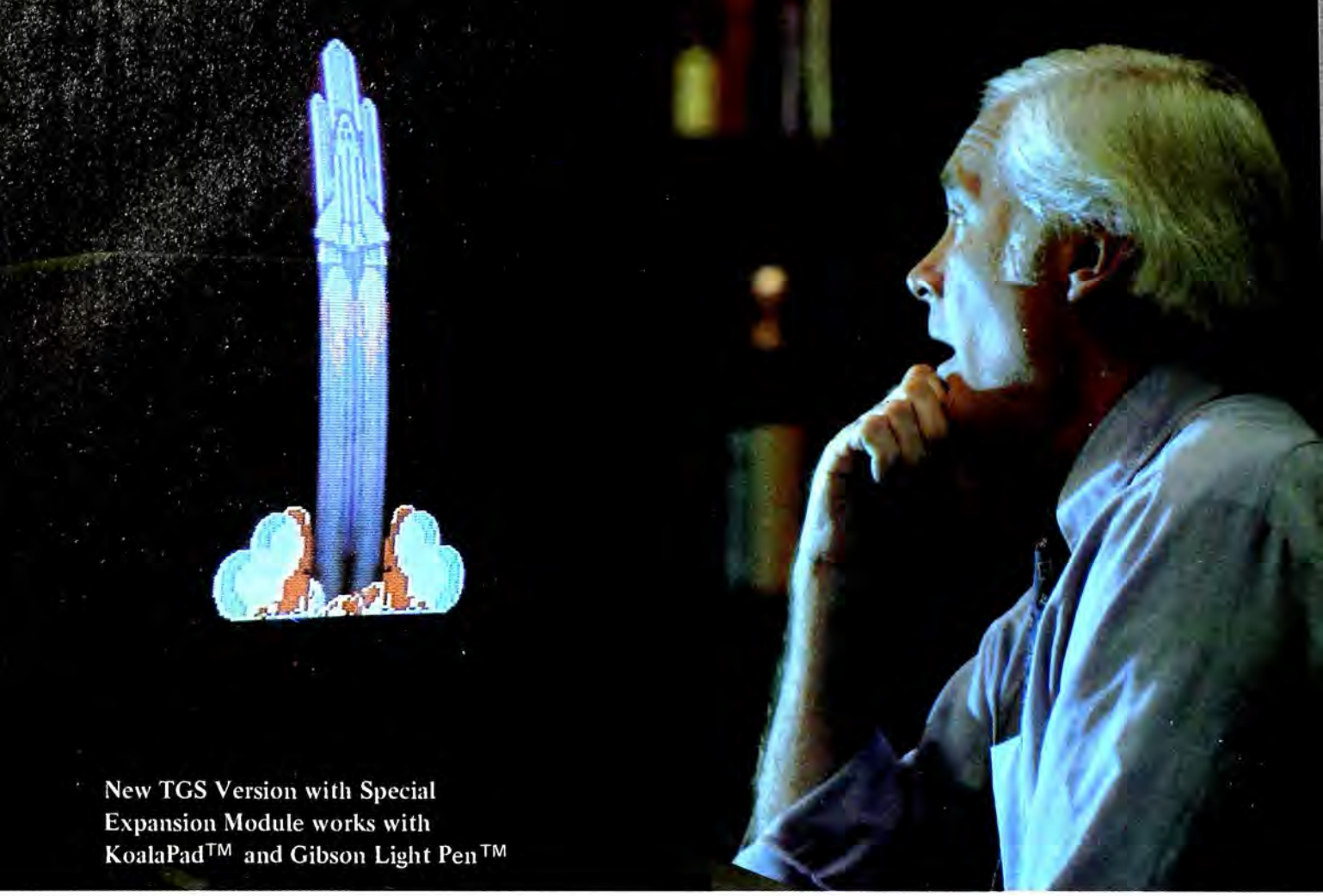
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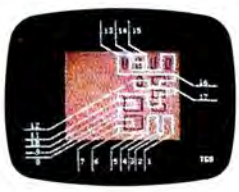
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IF Perhaps you can take a look at this one for me—not much software support here in Cairo. I am working on a library program that will use four disks for storing data. In order to identify a given disk's volume number, I use a peek (43622). This seems to work fine if the disk you want to check has been catalogued first. Consequently, my program has to catalog (followed by a home command to cover this approach up) each disk I want the program to check the volume number on. Can you suggest a different approach or some different way to use the peek (43622)? Much obliged for any assistance you may offer. If it helps, I'm using an Apple II Plus and DOS 3.3 (which, incidentally, has been customized to work in Arabic—right to left, and in Arabic script). *Scott Bellows, Cairo, A.R.E*

THEN The standard method for testing the volume number of a disk is to use the "V" parameter. *Print D$;"open datafile, V33"*, for example, will return a *volume mismatch error* if the disk in the drive has a volume number other than 33. The volume parameter, incidentally, is ignored by the catalog command—catalog will never return a volume mismatch error.

Peek (43622) will return the last volume number you specified with the V parameter, except after the catalog command. After catalog it holds, as you have discovered, the volume number of the disk catalogued.

Peek (47094) will return the volume number of the last disk accessed by DOS with any DOS command. You can use this peek after a volume mismatch error to find out the volume number of the disk that is actually in the drive. *Tom Weishaar*

IF I buy lots of stock and commodity data for my Apple II Plus. These figures always come to me in sequential text files. I prefer to work with read-data files. Is there any way to transform sequential text file data to read-data files? I could exec them except that the text file data never includes line numbers. Can they be execked without line numbers? *Charles M. Larson, Whittier, CA*

THEN It sounds like what you want to do is change a sequential text file holding lines of numerical data into Basic *data* statements that would live, along with your program, in an Applesoft file.

If you have a word processor that can read your text files, load a file and insert a line number and the word "data" in front of each line. Save this as a new file. Then exit your word processor, load your Basic program, and exec the new file. Its lines will be added to your Basic program as a series of data statements.

I suspect you prefer the read-data technique of Basic to the open-read-input technique of DOS because Basic allows you to see your data—thus it's easier to know what you are doing. Using a word processor to check out the contents of a file often makes it easier to work with the file directly. Once you've seen how the file is organized, you may find you don't need to do the conversion to data statements after all but can easily write a routine to read the file directly. *Tom Weishaar*

IF Is there any way I could take a machine language hello program I've written, load it under DOS, and then not only initialize my disk with the program but also extend DOS a page or two so that when it booted it would automatically load the program in with DOS? If there is a way, would one be able to break out of it by hitting a control-C before it was able to run the program? *Peter McMurray, Ithaca, NY*

THEN The simplest way to accomplish what you want to do is to set up DOS so that it will brun rather than run a greeting program. To do this, boot your system master, enter *poke 40514,52*, and init a new disk. This disk will have a Basic hello program on it that you'll want to delete and replace with your machine language program (give it the same name as the Basic file you delete). Then, whenever this new disk is booted, the machine language hello program will run. Control-C will not break the process.

It is also possible to have a machine language program load automatically with DOS; it's easiest to use the empty sectors in track 2 for this; however, the technique is much more complex than the solution suggested here. *Tom Weishaar*

IF A spooler for the Apple III by John Jeppson was presented in the October 1983 *Softalk*. I'm envious. Please tell me if it's possible to convert this program for my Apple IIe. How would I find the materials to create my own?

What kind of features on the Apple III make this spooler possible? Do these things exist in the Apple IIe? *Bryan Byles, Seattle, WA*

THEN Unfortunately a spooler of this type is probably not possible on the Apple II or IIe. The spooler is essentially a machine language program that operates independently while you are using the computer for other things. The spooler program is located in an installable driver, which is really part of Apple III's operating system.

Virtually all of Apple III's operating system is stored on disks and loaded into RAM memory. It is, therefore, not fixed; it may be altered and updated. Drivers are one part of this operating system; they are the machine language programs that operate the printer, console, and any



other devices attached to Apple III. By installing various different drivers, you can create a custom-made configuration appropriate for the specific task at hand. The spooler is such a driver and replaces the usual printer driver.

Installable drivers are not available on the Apple IIe. In that machine, much of the operating system is in ROM. Specifically, most output is handled by the Monitor, which is part of the machine firmware and cannot be altered. So if a spooler is possible at all, it would have to be of a radically different design.

The spooler program for Apple III was fun to write, and it illustrates some peculiarities of Apple III's operating system. But for practical use with either Apple II or Apple III you are probably better off with one of the hardware buffers that plug in between the computer and your printer. *John Jeppson*

IF I have an Apple II Plus and an Apple Dot Matrix Printer (Prowriter 8510A with a unique ROM). The printer manual calls for an escape-X ($1B 58) command to enable the underline mode.

Using the CHR$ function (CHR$(27); (CHR$(88)) from Basic, I can enter this mode and everything works fine.

Under *Apple Writer II* control, I can enable the underline mode using a variety of methods. For example, using the control-V (embedded print) command, I can use an escape-shift-X command, which results in $DC being used to enable underlining.

My question is this: Why is it that $1B 58, 1B D8, and DC will all enable underlining when the manual only calls for $1B 58? *Gary Wegner, Spring Green, WI*

THEN Your question, why $1B 58 has the same effect as $1B D8, concerns the way in which the Apple deals with ASCII data. The normal Apple character set is in a format called "seven-bit ASCII": It includes only 128 displayable characters, so each character can be specified by a unique seven-bit binary number. But the Apple normally thinks in eight-bit bytes, which means there is one extra bit in each character byte.

The character information is stored in the lower seven bits of each byte (bits 0 through 6), and the high bit (bit 7) is used for other things. For example, in keyboard input processing, the high bit is used as a "key-pressed" signal; in output processing, the high bit can be used to select inverse or flashing mode.

For this reason, many peripheral systems simply ignore the high bit of an ASCII code. Since the only difference between $58 and $D8 is the high bit, these two signals probably look like the same character to your printer control ROM.

The $DC you use in *Apple Writer II* isn't mentioned in your printer manual because it's a command to the word processor, not to the printer. It is the eight-bit ASCII representation for a backslash (\), which is *Apple Writer II*'s underline token. *Jock Root*

IF I am writing a program and I'd like to find a generic (public domain) copy program for one or two drives in order to provide for making backups in my program. Now, I have to make the user insert a DOS 3.3 disk, and then an exec file loads, modifies, and saves *CopyA* on the user's disk along with Copy.objo. It's not the most convenient, but I'm not that much into DOS, and I didn't want to steal someone else's copy program.

Can anyone give me a quick and dirty copy program? *Warren Michelsen, Page, AZ*

THEN I don't think a copy program more generic than *CopyA* is possible. While it's true that *CopyA* isn't a public domain program, Apple will license it to you for a small annual fee. You or your publisher will have to license Apple DOS for your programs anyhow. Just sign up for *CopyA* at the same time. This is the cheapest and easiest solution to your problem. After licensing *CopyA*, incorporate it into your programs however you like. For more information on licenses for Apple software, contact Vendor Support at Apple Computer, 20525 Mariani Avenue, Cupertino, CA 95014. *Tom Weishaar.*

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IBM Shark-Bitten at Softcon. Must Be Mac the Knife



☐ Having proved his ability to present the microcomputer industry to consumers, **Jerry Milden** (Northeast Expos) has taken on the retailer. **Softcon**, the first of what Milden would like to make an annual microcomputer dealer expo, debuted in the Superdome in New Orleans February 21–23, just a week before Mardi Gras. Whether it was expectations of a well-attended show, Jerry Milden's forceful personality, or the lure of N'Awlins (they even write it that way), a large contingent of software publishers and peripherals manufacturers came to hawk their newest wares in the heart of Dixieland.

Computer producers were represented too—**IBM** had enough booth space to floor a large home, with the new portable PC tucked away in the downstairs den. **Apple**'s island was smaller but boasted a mountain-sized model of a Macintosh, which looked like it worked—at least the huge monitor screen ran Macstuff and interacted with showgoers. The mouse stayed mouse-sized.

Real Macs were just about everywhere, and many booths where they weren't flew big, rainbow Apple-emblazoned "Macintosh Development Team" banners. Many exhibitors sported tiny buttons with the same message.

There was little new at Softcon. Even most of the Macproducts were simply translations of Apple II or IBM PC offerings. Perhaps the most intriguing, truly new product, and it's for the Mac, was a database-thinking-aid-organizing program from **Odesta** called *Helix*. It isn't finished, and while you could feed a Mac habit fiddling with its demos, you couldn't really do any of its functions. *Helix* was the talk of the show, but no one seemed to know precisely what it was, nor did they care that they didn't; it still looked great. *Helix* looks like it will go beyond spreadsheets and databases and word processors; it looks like it might be the first program that can usefully help you think.

Not enough dealers showed up for the show, it appeared, to warrant the tens of thousands of dollars put into the big booths on the main floor football field; but the dealers who came seemed to take seriously what they were doing, which probably made the show a profitable one for the people who stuck to modest booths on the sidelines or in the loge.

The undisputed masters of the text adventure, **Infocom**, showed up with a button-down attractive booth and a barker with a honeyed spiel. But president **Joel Berez** apparently missed the point of evenings during shows: reward, Joel; *fun*. And very profitable sometimes, too—*cf.* **Michael Berlyn**. (So no more staff meetings after six.) This was Infocom's first show appearance anywhere. Considering that the company ranks high on any industry list of the five healthiest software firms, one wonders which adventurer hitched up this cart and horse.

Quicksilva came from Great Britain, via San Antonio, and, tucked among rather undistinguished arcade offerings, the firm had cached a gem. Running on a Timex with a special hookup was *Ant Attack*, a beautifully made arcade-adventure built around saving people from the super-hi-res ants in Antescher Castle. Ant*escher*? You got it; the multiscreened three-dimensional mazelike castle is exquisitely Escheresque in style. You can shift among several viewpoints, do in some ants, and save lots of people—with practice. Plans for the game may include an Apple II version.

The class party of the show was **Mindscape**'s Wednesday evening riverboat ride. Upon boarding, guests received bags of chips to squander at roulette, craps, baccarat, and blackjack, while seemingly endless supplies of hot hors d'oeuvres and fingertip sandwiches surfeited the gamers. At the cruise's end, winners gathered to bid chips for prizes: $55,000 for a $500 airfare certificate; upward of $70,000 for a gumball-machine phone (**Broderbund** got outbid); more than $100,000 for fold-up travel bags. It's curious what happens when you know the floor is about to drop out of your currency.

The atmosphere belied the show's success. Since crowds were small, there was no dealing with slews of hot, impatient people waiting for demos or answers. There was time to chat, to demonstrate products at leisure, and to mingle. It helped that the exhibitors in general felt extraordinarily well fed; New Orleans has that affect on people.

Softcon sponsored a wealth of panel-type seminars on the processes of getting software from the minds of programmers to consumers. From the Apple world, you could garner words of wisdom from **Doug Carlston** (Broderbund), **Ken Williams** (Sierra On-Line), **Mark Pelczarski** (Penguin), **Bill Bowman** (Spinnaker), **Bill Gates** (Microsoft), **Fred Gibbons** (Software Publishing), **Frankston** and **Bricklin** (take your pick; Software Arts), **Trip Hawkins** (Electronic Arts), **Terry Opdendyk** (VisiCorp), **Seymour Rubinstein** (MicroPro), plus a couple of hangers-on called **Steve**. There were also magazine publishers and editors, distributors, venture capitalists, public relations people, lawyers, researchers, prognosticators, rich men, poor men, and . . . no, hopefully none of those.

The roster of attendees and exhibitors was impressive, far more than the show itself. If Jerry Milden truly wants Softcon to become an annual event, his best bet is to keep it in New Orleans. Or Acapulco. Or Paris. Or Gstaad. Or. . . .

☐ In a move that signals the entry of a new phase in software publishing, three companies—**H.A.L. Labs**, **Mind Games**, and **Software Entertainment Company**—have joined forces to form a new venture called **The Software Consortium** (Beverly Hills, CA). "By centralizing many of our operations, we'll be able to enjoy the advantages that go with being a large company while at the same time preserving the integrity and quality of product generally associated with the smaller software houses," says **Greg Segall**, the Consortium's president. Combined operations, volume purchasing, and special dealer policies will be possible with the new setup. Other small companies will be offered a chance to participate in the Consortium, "exposing them to channels of distribution they would not otherwise have penetrated," adds Segall.

☐ "Well equipped to seize the opportunity," **Thorn EMI Information Technologies Ltd.** (London, England) plans to "aggressively expand" into the software market with the formation of **Thorn EMI Computer Software** (Costa Mesa, CA). "We intend to be aggressive in building Thorn EMI into a major element in the microcomputer software publishing market,"

says **Louis A. Delmonico**, president of the new software firm. Considered the IBM of the music business, Thorn EMI's U.S. holdings include Capitol Records, EMI America/Liberty Records, Screen Gems, and Beechwood Music. With new product development and program acquisition under way, the software division's first product will be a set of games designed by the video arm of the Thorn EMI octopus, Thorn EMI Video Enterprises.

☐ In the company's first joint venture, **Apple Computer** (Cupertino, CA) has joined with **Grupo Manzana** (Mexico City, Mexico) to form **Apple De Mexico**, expressly for the manufacturing and marketing of Apples in Mexico and Latin America. Taking advantage of Mexico's liberal taxation policies on foreign investment and its plentiful cheap labor, the new company is expected to start up a manufacturing plant near Mexico City this month. Also, the design of a line of Spanish-language software is planned. In other news, a federal grand jury in Philadelphia has indicted five companies and six individuals on charges of smuggling counterfeit Apple computers into the U.S. According to the *Wall Street Journal*, this is the first time federal criminal charges of smuggling have been handed down for computer counterfeiting. Previously, the actions were filed as civil charges under copyright-infringement laws. To date, Apple Computer has filed fifty such charges. In the Pennsylvania case, counterfeit Apples were reportedly brought in from Taiwan by two Pennsylvania residents and then sold to two other businesspeople. Federal agents using an undercover operation bought fifty of the bogus machines last March. A search of the suspect's business address revealed enough parts for 300 more. If convicted, the alleged smugglers could receive up to twenty-five years in prison and a fine of $50,000.

☐ A new company called **InterSol** (Braintree, MA) is offering TechniCall Telephone Support, a fee-based service option available to purchasers of approximately thirty popular software products, such as *WordStar*, *1-2-3*, and *dBase II*. The service is also available through dealers.

☐ **Roger Schiffman** has been named the new president and chief executive officer of **Screenplay** (Chapel Hill, NC). Formerly a director of Fox Video Games, a division of 20th Century-Fox, Schiffman plans to make Screenplay "a leader in both entertainment and educational software" by taking advantage of the resources of its parent company, **AGS Computer**. He will direct the company's new marketing efforts from Chicago.

☐ The high-tech executive search and consulting firm of **Ryan, Miller and Associates** (Los Angeles, CA) has announced the appointment of former **Softsel** (Inglewood, CA) executive **Gary P. Rolfes** as president of its high-technology division.

☐ **Dow Jones and Company** (New York, NY) has purchased an equity interest in **Cdex** (Los Altos, CA), publishers of computer training programs. "We are enthusiastic about our association with Dow Jones," says Cdex president **Bruce J. Frisch**. "It will add more credibility to our presence in the marketplace." He adds that the company will be working closely with Dow Jones in producing additions to their current product line.

☐ **Verbatim** (Sunnyvale, CA) has announced the appointment of **Shely Saidman** to the account marketing manager post. His duties will include the creation, development, and implementation of special marketing programs targeted at commercial and public sector users. Saidman is a seventeen-year veteran of IBM.

Verbatim, in cooperation with the **American Camping Association,** is offering a free *Camps 'n' Computers* reference guide to one hundred computer camps nationwide.

☐ **Albert Vezza** has joined **Infocom** (Cambridge, MA) as chief executive officer. Vezza, one of the founders of the four-year-old interactive fiction firm, will continue to serve as chairman of the board. Vezza joins the company from MIT, where he has been associate director of the Laboratory for Computer Science. The Programming Technology Group he spearheaded developed one of the first practical artificial intelligence systems that produced the techniques used in many of Infocom's adventures. A new line of business software from Infocom is under Vezza's command.

☐ Computer show exhibitors will have more muscle when dealing with show management with the creation of the **Computer Exhibitors Association** (Corte Madera, CA). Headed by Raging Bear Productions president **David Russell**, the CEA will deal with "educating exhibitors, recognizing achievement, fostering communication between members and show management, and providing a reliable support group," says Russell. Show management participation is being actively sought. So far Computer Faires and National Trade Productions have shown interest.

☐ **Ashton-Tate** (Culver City, CA) has named **Cathy Bennett** sales and marketing manager of the company's newly created publications group. In her new post, Bennett will handle marketing strategy and manage sales efforts for the books and periodicals division. Prior to joining the company, she was in research and development and sales at Prentice-Hall. Also, **Julian K. Brantley** has been promoted to vice president of communications at Ashton-Tate. He will be responsible for marketing communications, public relations, advertising, and market research. Brantley joined the company in 1982 from Needham, Harper and Steers.

Ashton-Tate has announced an agreement with **Reston Publishing** (Reston, VA), a division of Prentice-Hall, to codistribute selected titles from each company's line of computer publications. The unusual arrangement signifies a trend toward increased selling of books through computer retail channels and selling of software in general interest bookstores. Reston publications that support the popular *dBase II* will be the first to be moved by Ashton-Tate in the deal. Eight Ashton-Tate titles will be picked up initially by Reston.

☐ **Micromedia Marketing** (Pasadena, CA) has agreed to distribute the full line of computer books and software published by **Chilton Books** (Radnor, PA). The technical publishers are best known for their bestselling automotive manuals, although they publish in all areas of technical information, including computers.

☐ The handling of direct marketing communications for **Sorcim** (San Jose, CA) has been awarded to **Wunderman, Ricotta and Kline** (New York, NY), one of the world's largest direct marketing organizations. Other agency clients include Book of the Month Club, General Foods, Avis, and L.L. Bean. With a new agency, Sorcim will be changing its marketing strategy from predominantly printed ads to direct mail.

☐ **Syntauri** (Los Altos, CA) has appointed **Allan J. Fedor** to the post of president and chief executive officer. Fedor will be responsible for aggressively leading the software developer's recent entry into the consumer musical products market. Company cofounder and past president **Ellen Lapham** now holds the position of chairman of the board.

☐ Louisiana's Secretary of State, **Jim Brown**, has announced new legislation that would make the state the first to prohibit the unauthorized duplication and distribution of computer software. The bill was introduced in the current session of the legislature by State Senator **William Atkinson** and Representative **Al Ater**, both Democrats. Louisiana is trying to lure high-tech companies to relocate there and it is hoped that strong, favorable legislation will help. The pending bill has Brown's "unqualified support" as the state's chief business officer.

☐ In addition to recently signing with three major software distributors, **Virtual Combinatics** (Rockport, MA) has taken advantage of unique distribution channels outside the computer industry. The company has announced success in selling its *Micro Cookbook* software through **Cook-A-Doodle-Doo** (Bellevue, WA), a chain of specialty kitchen stores.

☐ **Datacopy** (Mountain View, CA) is moving. The new address is 1215 Terra Bella Avenue, Mountain View, CA 94043.

☐ **DBI Software Products** (Mount Pleasant, MI) has relocated to new offices at One Energy Place, 5805 East Pickard Road, Mount Pleasant, MI 48858.

☐ **Advanced Ideas** (Berkeley, CA), formerly Computer Advanced Ideas, has recently moved its headquarters to 2550 Ninth Street, Suite 104, Berkeley, CA 94710.

☐ Europe's oldest microcomputer show is scheduled for May 22–26 at the Palais Des Congres in Porte Maillot, Paris, France. The ninth annual **Micro Expo** is primarily a business show, drawing a third of its attendance from the management ranks of European companies.

☐ **Silicon Age Awareness.** The North American Society for Corporate Planning (NASCP) will hold its 1984 annual conference April 29–May 2 at the Sheraton Palace in San Francisco, California. Titled "From Steel to Silicon: Planning in a Restructured Economy," the conference will feature a keynote address by Nolan Bushnell, chairman of Catalyst Technologies and founder of Atari. ■

Oh, Nuts. In the March Tradetalk, an item concerning **Orange Micro** and **Street Electronics** said, "Street Electronics will not concentrate on manufacturing the Echo II synthesizer." Ridiculous, of course. The line should have read, "Street Electronics will *now* concentrate. . . ."



THE PICK OF THE CROP

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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.

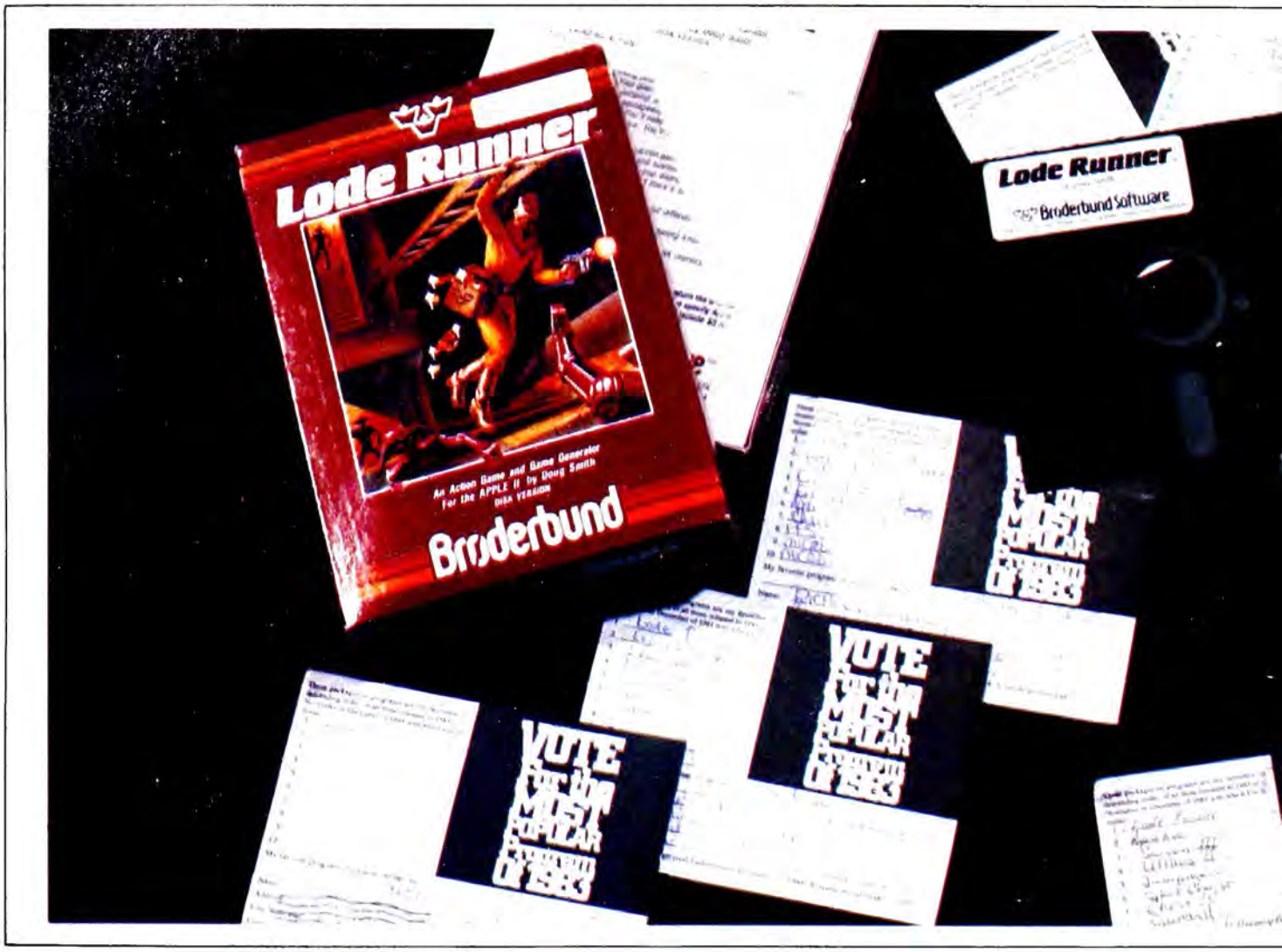
THE COMPLEAT APPLE™ CP/M, by Steven Frankel, is the first comprehensive guide for Apple™ CP/M users. It provides in-depth comparisons between two CP/M 2.2 versions, the Microsoft Soft Card and the Micropro Star Card/Applicard. It also examines the Digital Research ALS card utilizing CP/M, and reviews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

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LODE RUNNER RUNS AWAY



WIZARDRY REPEATS WITH ITS SECOND

In horse racing, it's called form.

Among ethnic groups, it's called tradition.

In the Apple market, you might call it business as usual.

Whatever label you place on it, software from Broderbund and Sir-tech were the most honored by Apple buyers for the year of 1983, repeating the 1982 results.

Lode Runner from Broderbund was the favorite program of 1983, following in the footsteps of 1982's winner, *Choplifter*. *Wizardry* from Sir-tech repeated as the all-time favorite program. For the Apple III, the *Catalyst* from Quark was the most popular program.

In the voting for all-time champ, there were parallels with the prior year. Like last year, it wasn't even close. *Wizardry* had a 3-to-1 advantage over second-place *Apple Writer II*. More amazing was that *Wizardry* duplicated its 4-to-1 lead over the most popular program of the year.

In last year's voting for the 1982 most popular program, *Choplifter* edged out *Wizardry* for the year's honor. But *Wizardry* scored an overwhelming victory in the all-time race while *Choplifter* came in fourth. That scenario was essentially repeated in that *Lode Runner* scored fourth on the all-time list and trailed *Wizardry* by the same 4-to-1 ratio that reflected the difference between *Choplifter* and *Wizardry* the year before.

Unlike *Choplifter*, with its narrow victory over *Wizardry* as the most popular program of 1982, *Lode Runner* won in a walk. It was named on 167 more ballots than runner-up *Pinball Construction Set* and tallied more than fifteen hundred more points. The race was close for second, however, as *Pinball Construction Set* narrowly edged *Ultima III*. *PCS* was named on 85 more ballots but racked up only a thirty-three-point decision.

For readers new to the magazine, *Softalk*'s one hundred seventy thousand subscribers were asked to vote for their ten favorite programs released in the time frame from October 1982 to December 1983. In addition, they could vote for one program released at any time as their all-time favorite.

Votes were tabulated by allotting ten points for a first-place vote, nine points for a second, and so forth down to one point for a tenth-place vote. Results for the most popular award for 1983 are measured by the most points, rather than by the most votes. Results for the all-time favorite are on the basis of most votes.

The omission of several of the bestselling pieces of Apple software—such as *VisiCalc*, *PFS:File*, *DOS Boss*, *Zork I*, *MasterType*, *Home Accountant*, or *Choplifter*—does not indicate a lack of popularity or lack of quality. As older releases, they simply weren't eligible for consideration in 1983.

Likewise, the relatively weak showing of such new programs as *One-on-One* and *Flight Simulator II* reflect their newness to the market. Rather than drawing negative conclusions, it's appropriate to marvel that they scored so well while being sold for such a minor portion of the eligibility period.

Charge of the Eight Hundred. For all the hoopla about the IBM

WITH '83



ALL-TIME HONOR

Personal Computer and Macintosh and other pretenders, this year's balloting again reflects a robustness in the Apple software market that those other markets can only envy. A total of 874 different programs were mentioned by voters as one of their favorites. That's up from last year's total of 848. It's true that some of the mentions were for ineligible programs—many voters couldn't refrain from listing *VisiCalc*, *Wizardry*, *Castle Wolfenstein*, and others—but no other software market can boast anywhere near 874 new programs in a fifteen-month period worth special mention by the software users.

Most voters had little trouble citing ten favorite programs, but there were the exceptions. One voter listed three titles and commented, "These are the only ones I have and like." That left the tabulators wondering whether he had more and didn't like them or whether the three programs represented his entire software library. Another voter for only three programs left no doubt. His comment: "I have fifty others I can't stand."

The year was perhaps best summed up by the voter who commented, "1983 . . . not a great year for software . . . but not a bad year either."

The changing emphasis in the use of Apple computers was in evidence in the final most popular vote. Last year, eighteen arcade games and twenty-five entertainment products made the 1982 Top Thirty list. This year eleven arcade games and twenty entertainment products made the list. That's still an overwhelming majority of the list, but perhaps as salient is the fact that nonentertainment programs doubled from five to ten in one year.

That trend was also noticeable in the All-Time Top Thirty listing. Last year, thirteen nonentertainment products were in the All-Time Top Thirty. This year there were fifteen nonentertainment programs making the list.

Repeat Business. As software gets more sophisticated, it's apparently getting more difficult to replicate success. Last year, there were several authors who had two programs on the most popular list. This year there were only three: Lord British with *Ultima II* and *Ultima III*, Mark Simonsen with *Double-Take* and *Beagle Basic*, and the team of Marc Blank and Dave Lebling with *Zork III* and *Enchanter*.

Only two authors were able to place two works on the all-time list—the same two that accomplished the feat last year. Andrew Greenberg and Robert Woodhead had *Wizardry* and *Legacy of Llylgamyn* on the list this year. *Legacy* supplanted their *Knight of Diamonds* on the All-Time Top Thirty. Lord British had *Ultima II* and *Ultima III* on the all-time list this year. *Ultima III* replaced *Ultima* as Lord British's second entry on the all-time charts.

Broderbund became the publisher champ this year after placing second last year. Four Broderbund packages were among 1983's most popular and three made the all-time list. Electronic Arts, which hadn't

THE TOP THIRTY-1983

	Index	
1	162.33	**Lode Runner**, Doug Smith, Broderbund
2	106.30	**Pinball Construction Set**, Bill Budge, Electronic Arts
3	105.44	**Exodus: Ultima III**, Lord British, Origin Systems
4	98.22	**Zaxxon**, John Garcia, Datasoft
5	95.44	**Legacy of Llylgamyn**, Robert Woodhead and Andrew Greenberg, Sir-tech
6	94.52	**Miner 2049er**, Mike Livesay and Bill Hogue, Micro Lab
7	84.22	**Apple Writer IIe**, Paul Lutus, Apple Computer
8	82.33	**Hard Hat Mack**, Michael Abbot and Matthew Alexander, Electronic Arts
9	60.85	**Bank Street Writer**, Gene Kuzmiak and the Bank Street College of Education, Broderbund
10	59.30	**Ultima II**, Lord British, Sierra On-Line
11	41.63	**Music Construction Set**, Will Harvey, Electronic Arts
12	41.26	**Multiplan**, Microsoft
13	38.15	**Stellar 7**, Damon Slye, Software Entertainment
14	36.93	**Double-Take**, Mark Simonsen, Beagle Bros
15	34.48	**Quick File IIe**, Rupert Lissner, Apple Computer
	34.48	**Zork III**, Marc Blank and Dave Lebling, Infocom
17	30.89	**Drol**, Benny Ngo, Broderbund
18	27.70	**Beagle Basic**, Mark Simonsen, Beagle Bros
19	27.56	**Mask of the Sun**, Alan B. Clark, Larry Franks, Christopher P. Anson, and Margaret Anson, Ultrasoft
20	26.67	**A.E.**, Jun Wada, Broderbund
21	23.37	**Pronto DOS**, Tom Weishaar, Beagle Bros
22	23.33	**One-on-One**, Eric Hammond, Electronic Arts
23	22.04	**Sargon III**, Dan and Kathe Spracklin, Hayden
24	21.07	**Beagle Bag**, Bert Kersey, Beagle Bros
25	21.04	**Rocky's Boots**, Warren Robinett and Leslie Grimm, The Learning Company
26	19.67	**The Quest**, Dallas Snell, Joe Toler, and Joel Ellis Rea, Penguin
27	18.59	**Sammy Lightfoot**, Warren Schwader, Sierra On-Line
28	18.22	**Planetfall**, Steve Meretzky, Infocom
29	17.41	**Fontrix**, Steve Boker and Duke Houston, Data Transforms
30	16.85	**Enchanter**, Marc Blank and Dave Lebling, Infocom

yet published a program in 1982, and Beagle Bros also placed four programs each on the 1983 list. Infocom had three packages on the list and Apple Computer, Sierra On-Line, and Microsoft each had two entries.

Microsoft tied Broderbund for the lead on the all-time list with three entries. Placing two programs on the All-Time Top Thirty were Electronic Arts, Sir-tech, Apple, Sierra On-Line, Beagle Bros, and Penguin.

Poll Vault. The most popular poll allows Apple owners to talk back to the *Softalk* Bestseller poll. The *Softalk* poll measures sales. The most popular poll measures user satisfaction. As usual, the owners liked some products that haven't registered so high on the sales charts.

Stellar 7, an arcade game that met with so-so success at the cash register, measured high in satisfaction, landing in thirteenth place. Two other arcade games, *Drol* and *Sammy Lightfoot*, scored higher than sales might indicate, although *Drol* is still new enough that it may make a bigger impression in subsequent Bestseller polls.

The biggest surprise was *Fontrix*, the revolutionary graphics system from Data Transforms. *Fontrix* has never been able to break through the dominance of Beagle Bros to place on the Hobby 10. Yet it outran dozens of better sellers to grab twenty-ninth on the most popular poll.

There were some surprises in the all-time list in that many programs that hadn't rated that high last year managed to make the list this year.

Magic Window, virtually ignored in last year's all-time contest, tied for twentieth in this year's balloting. *Adventure*, running neck and neck with *Global Program Line Editor* as the oldest program on the list, came from last year's also-ran position to tie for twenty-second. Among the programs that tied for twenty-sixth were *Flight Simulator*, *PIE Writer*, and *ASCII Express*, all programs that apparently benefited from upgrades between elections.

The top nine programs from last year's all-time list remained on the list again this year, but only four other of last year's favorites maintained positions on the list. New isn't necessarily better, however. Only *Lode Runner* and *Ultima III* of 1983's entries were able to crack the top ten.

The continuing popularity of *Castle Wolfenstein* is worth noting. Two years ago, when only a most popular poll for 1981 was conducted, *Castle Wolfenstein* placed second to *Raster Blaster*. Last year, it placed third all-time to *Wizardry* and *VisiCalc*. This year it scored sixth on the all-time list. With the exceptions of *Wizardry* and *VisiCalc*, this is the strongest showing of any program over the three-year period.

Buckaroo Buzz. Other than remarking on specific programs, voters most often commented on the intertwined issues of piracy and software prices. Some voters who failed to list ten programs pointed out that they didn't have enough money to buy ten programs in a year at today's prices. Others confessed to piracy while protesting that they'd quit if the software prices came down. Another regular refrain was to praise Beagle Bros and Penguin for their restraint in pricing and their policies of not copy-protecting their programs.

Another facet of the issue was presented by the voter who listed only business and utility programs on his ballot. His comment was that *Locksmith* was "my favorite game."

Two software genres inspired partisanship that cut both ways. While most comments on software would merely cite attributes of their favorites, voters had strong likes and dislikes when it came to arcade games and word processors. Arcade game players felt compelled to put down the programs they thought might be in competition with their favorite, as in, "I love *Zaxxon*, but I can't stand *Lode Runner*."

Word processing program adherents were even more vindictive. They'd let their vote represent the positive comment while taking advantage of the comment line to blast others.

The word processing category came up with an invisible program this year in *Sensible Speller*. Last year, it was rated best word processing program of 1982. It wasn't eligible this year, but it got more comments than any other program. The problem was that it was always in the second position, such as, "*Format II* and *Sensible Speller* have made my writing better."

Because the word processor linked with it was getting the all-time vote, *Sensible Speller* does not show up on the all-time list. But a straw vote of the comments would show *Sensible Speller* to be the most consistently highly thought of program in the word processing genre.

Eight Is Enough. One of the statistics *Softalk* calculates from the votes but doesn't print is the average value of each vote a program receives. A perfect average is 10.00, meaning that all of those who voted for a package made it their favorite. An excellent average is 8.00, meaning that on average a program is among the three best that the Apple owner has.

Programs receiving votes averaging 8.00 or higher were few and far between. Only *Apple Writer IIe* achieved that level among the 1983 Top Thirty. *Ultima III* was second at 7.75.

APPLE III TEN

1 **Catalyst**, Tim Gill, Quark
2 **Quick File III**, Rupert Lissner, Apple Computer
3 **Keystroke Database**, Brock Software Products
4 **Apple Speller III**, Charles Hartley/Sensible, Apple Computer
5 **Multiplan**, Microsoft
6 **Think Tank III**, David Winer and John Llewellyn, Living Videotext
7 **BPI General Ledger III**, John Moss and Ken Debower, Apple Computer
8 **Inkwell III**, Foxware
9 **Terminus**, Tim Gill, Quark
Payroll, State of the Art

MORE ARCADE TEN

12 **Minit Man**, Greg Malone, Penguin
13 **Spare Change**, Dan and Mike Zeller, Broderbund
14 **Bolo**, Elvyn Software, Synergistic
Repton, Dan Thompson, Sirius
16 **Cubit**, Abe Oswal, Micromax
17 **Super Taxman II**, Brian Fitzgerald, H.A.L. Labs
18 **Wavy Navy**, Rodney McAuley, Sirius
19 **Microbe**, Bob Clardy and Alan Zalta, Synergistic
20 **Bilestoad**, Mangrove Earthshoe, Datamost
21 **Evolution**, Don Mattick and Jeff Sember, Sydney Development

HOME EDUCATION TEN

1 **Rocky's Boots**, Warren Robinett and Leslie Grimm, The Learning Company
2 **Computer SAT**, Harcourt Brace Jovanovich
3 **Stickybear ABC**, Richard Hefter and Jack Rice, Weekly Reader Family Software
4 **Type Attack**, Jim Hauser and Ernie Brock, Sirius
5 **In Search of the Most Amazing Thing**, Tom Snyder, Spinnaker
6 **Early Games for Young Children**, John Paulson, Counterpoint
7 **Stickybear Numbers**, Richard Hefter and Janie and Steve Worthington, Weekly Reader Family Software
8 **Delta Drawing**, Computer Access Corporation, Spinnaker
9 **Fat City**, Richard Hefter and Steve Worthington, Weekly Reader Family Software
10 **Microzine**, Information Technology Design Associates, Scholastic

WORD PROCESSORS TEN

1 **Apple Writer IIe**, Paul Lutus, Apple Computer
2 **Bank Street Writer**, Gene Kuzmiak and Bank Street College of Education, Broderbund
3 **PFS:Write**, Sam Edwards, Brad Crain, and Ed Mitchell, Software Publishing
4 **HomeWord**, Ken Williams and Jeff Stephenson, Sierra On-Line
5 **Word Juggler IIe**, Tim Gill, Quark
6 **Apple Writer II Preboot Disk**, Kevin Armstrong and Mark Borgerson, Videx
7 **Megawriter**, Megahaus
8 **Lexicheck IIe**, Tim Gill, Quark
9 **Write Away**, Doug Stinson, Midwest Software Associates
10 **Cut & Paste**, Tim Mott, Norma Lane, Steve Shaw, David Maynard, Dan Silva, Steve Hayes, and Jerry Morrison, Electronic Arts

Among programs not making the 1983 Top Thirty, but receiving ten votes or more, only four other programs were consistently rated that high. *T.H.E. Spreadsheet* from A.P.P.L.E. tallied an 8.03 average, *VisiCalc: Advanced Version* for the IIe scored 8.41, *Format IIe* averaged 8.05, and *Word Juggler IIe* scored the highest average at 8.74.

Programs that scored high averages on five to nine votes were *ORCA/M*, 8.75; *Word Handler*, 8.29; *DataFax*, 8.14; *Bookends*, 8.33; *BPI General Ledger*, 8.33; *Agri-Ledger*, 9.8 and raves from every user; *Zardax*, 9.0; *Keystroke*, 8.6; *Big Mac*, 8.2; and *The CIA Files*, 8.2.

It's interesting to note that no entertainment program reached 8.00 as an average. The game players put their favorites in the Top Thirty, but there was no consistent consensus as to value, whereas the applications-oriented users seemed much more consistent in giving a good program a high appraisal.

Hard Talking Catalyst. Perhaps the supreme irony in the results was the naming of a utility program as the favorite program on the applications-oriented Apple III. *Catalyst*, a version of which is now available for the Apple IIe running under ProDOS, allows the user to move copy-protected programs onto the ProFile hard disk. The increased speed and efficiency of the programs on a hard disk have made *Catalyst* a must for III owners.

Even though it wasn't eligible, *VisiCalc: Advanced Version* drew the second greatest support among III owners. *Quick File III* was second among eligible programs, with *Keystroke Database* third and *Apple Speller III* fourth.

Had they been eligible, *Apple Writer III* would have followed *Quick File III*, and *Word Juggler* would have followed *Apple Speller III*.

Software Sorcery. Fantasy fans boosted their three favorite programs into the top ten of the most popular Top Thirty: *Ultima III*, *Legacy of Llylgamyn*, and *Ultima II*. *Wizardry* and *Knight of Diamonds* garnered enough votes that they would have been fourth and fifth if they had been eligible. As it was, *Chivalry* captured fourth and *Standing Stones* was fifth.

Strategic Simulations and chess programs dominated the Strategy list. *Sargon III* won the nod as the year's best and *Chess 7.0* scored as the third best. SSI placed five programs on the ten-rung listing. The fate of *Flight Simulator* is worth noting. Its original version was not eligible and therefore was deprived of the fifth place the voters accorded it. *Flight Simulator II* was too new to attract much support, ending up eleventh. Together, the programs would have been second.

As would be expected, Infocom dominated the Adventure category. They captured six places and *Zork III* was the big winner. Penguin scored two places with their hi-res adventures. Either adventure fans are more aware or 1983 was a great year for adventures: This was the only category where not even one ineligible program gathered enough votes to have earned a place on the list.

The Arcade 10 list actually picks up where the 1983 Top Thirty leaves off. Since eleven arcade programs made the major list, there was little purpose in merely relisting them. Broderbund and Electronic Arts dominated the list. Perhaps the biggest surprise was the appearance of *Evolution* as the twenty-first choice. It made few waves in the marketplace but apparently delighted its buyers.

Perhaps indicating the extra depth now required of arcade programs, 1983 marked the first year in which no author wrote two arcade games that successfully captured the fancy of the public. In the past, such names as Nasir Gebelli, Bill Budge, Ken Williams, Olaf Lubeck, David Snider, Paul Stephenson, and Jim Nitchals had contributed two or more of the top programs in a given year.

Word Wranglers. *Apple Writer IIe* and *Bank Street Writer* ran 1-2

ADVENTURE TEN

1. **Zork III**, Marc Blank and Dave Lebling, Infocom
2. **Mask of the Sun**, Alan B. Clark, Larry Franks, Christopher P. Anson, and Margaret Anson, Ultrasoft
3. **The Quest**, Dallas Snell, Joe Toler, and Joel Ellis Rea, Penguin
4. **Planetfall**, Steve Meretzky, Infocom
5. **Enchanter**, Marc Blank and Dave Lebling, Infocom
6. **Suspended**, Michael Berlyn, Infocom
7. **Sherwood Forest**, Dale Johnson and Dav Holle, Phoenix
8. **Starcross**, Dave Lebling and Marc Blank, Infocom
9. **Witness**, Steve Galley, Infocom
10. **The Coveted Mirror**, Eagle Berns and Holly Thomason, Penguin

FANTASY FIVE

1. **Exodus: Ultima III**, Lord British, Origin Systems
2. **Legacy of Llylgamyn**, Robert Woodhead and Andrew Greenberg, Sir-tech
3. **Ultima II**, Lord British, Sierra On-Line
4. **Chivalry**, Richard Hefter, Weekly Reader Family Software
5. **Standing Stones**, Peter Schmuckal and Dan Sommers, Electronic Arts

STRATEGY TEN

1. **Sargon III**, Dan and Kathe Spracklin, Hayden
2. **Germany 1985**, Roger Keating, Strategic Simulations
3. **Chess 7.0**, Larry Atkin, Odesta
4. **Broadsides**, Wayne Garris, Strategic Simulations
5. **Geopolitique 1990**, Bruce Ketchledge and Joel Billings, Strategic Simulations
6. **Space Vikings**, Mitchell Robbins, SubLogic
7. **Spitfire Simulator**, Ted Kurtz, Mind Systems
8. **North Atlantic '86**, Gary Grigsby, Strategic Simulations
9. **Pensate**, John Besnard, Penguin
10. **Galactic Adventures**, Tom Reamy, Strategic Simulations

BUSINESS TEN

1. **Multiplan**, Microsoft
2. **Quick File IIe**, Rupert Lissner, Apple Computer
3. **The Incredible Jack**, Business Solutions
4. **T.H.E. Spreadsheet**, Randy Wigginton, Guil Banks, and Steve Wozniak, A.P.P.L.E.
5. **Magicalc**, William Graves, Artsci
6. **Cdex VisiCalc**, Cdex
7. **Bookends**, Jonathan D. Ashwell, Sensible
8. **Agri-Ledger**, Dave McFarling, SBCS
9. **Supercalc**, Sorcim
10. **SoftGraph**, David Durkee, Softalk Publishing

HOBBY TEN

1. **Double-Take**, Mark Simonsen, Beagle Bros
2. **Beagle Basic**, Mark Simonsen, Beagle Bros
3. **Pronto DOS**, Tom Weishaar, Beagle Bros
4. **Fontrix**, Steve Boker and Duke Houston, Data Transforms
5. **KoalaPad Micro Illustrator**, Steve Dompier, Koala
6. **Tip Disk #1**, Bert Kersey, Beagle Bros
7. **Diversi-DOS**, Bill Basham, Diversified Software Research
8. **Einstein Compiler**, Dennis Goodrow and Shmuel Einstein, Einstein Corporation
9. **Flex Text**, Mark Simonsen, Beagle Bros
10. **Typefaces**, Bert Kersey, Beagle Bros

HOME TEN

1. **Music Construction Set**, Will Harvey, Electronic Arts
2. **Dollars and Sense**, Frank E. Mullin, Monogram
3. **Money Street**, Donald Hill and Robert Payne, Computer Tax Service
4. **Micro Cookbook**, Virtual Combinatics
5. **Smartcom I**, Hayes Microcomputer Products
6. **Softerm**, Lynn Stricklan, Softronics
7. **Think Tank**, Dave Winer and John Llewellyn, Living Videotext
8. **Know Your Apple IIe**, Muse
9. **Family Roots**, Steve Vorenberg, Quinsept
10. **Time Is Money**, Kenneth Tepper, Turning Point Software

on the Word Processing 10 list. The two newest entrants in the word processing sweepstakes—*PFS:Write* and *HomeWord*—were next. *Sensible Speller* would have followed *Bank Street Writer* if it had been eligible.

One clue to the competitiveness of the word processing genre comes with a look at the average scores of the programs. None averaged less than 6.02, that score indicating that the program was one of the voters' five most favored titles of the year. As mentioned earlier, *Zardax* actually averaged a 9.00, meaning that it ranked as one of the top two programs in the voters' libraries. Nine programs had averages higher than 7.00 but lower than *Zardax*.

Those figures carry with them two implications: that the word processing market is not an area for faint-hearted publishers and that the Apple user is being well served by publishers in that area.

Weekly Reader Family Software placed three titles in the Home Education 10 to lead that category. Spinnaker Software scored a double. The winner was from The Learning Company—*Rocky's Boots*. *Computer SAT* from Harcourt Brace Jovanovich was second. The monthly sales leader in the category, *MasterType*, was not eligible for placement but still got enough votes to have finished fifth.

One of the oddities is that *Typing Tutor*, another of the usual sales leaders, didn't have enough support to rate in the top fifty educational programs, but that could have been awareness on the part of the voters that the program was too old to be eligible.

Multiplan bested *Quick File IIe* as the most favored Business entry in 1983. *The Incredible Jack* was third and *T.H.E. Spreadsheet* was fourth. *VisiCalc* and *PFS:File* would have followed *Quick File IIe* had they been eligible.

The Business 10 was another area where Apple owners generally showed their satisfaction with the products being offered. Fourteen programs had average votes that exceeded 7.00, led by *Agri-Ledger*'s 9.80 rating.

Music Construction Set walked away with honors in the Home 10. Teenager Will Harvey's program had three times the points of second-place *Dollars and Sense*. *Money Street* just edged out *Micro Cookbook* for third. *ASCII Express* and *Home Accountant* would have followed fifth-place *Smartcom I* had they been eligible.

Sophie's Choice. As might have been expected, Beagle Bros dominated the Hobby 10 list with six entries. The company's control of the category is so complete that one voter, reflecting this year's mounting election fever, suggested Bert Kersey for president and Mark Simonsen for vice president. Simonsen's *Double-Take* took top honors, with his *Beagle Basic* a comfortable second.

All the non-Beagle nominees were surprises. *Fontrix* nailed down fourth place and *KoalaPad Micro Illustrator* got fifth. *Diversi-DOS*, sold only by mail order, nailed seventh and the *Einstein Compiler* got eighth.

Highest ranking of the ineligibles were *Copy II+* and *Graphics Magician*, which would have followed *KoalaPad* in the list.

Everyone's a Winner. Perhaps the best indication of the strength and depth of the Apple software market is that 261 different titles were cited by voters as being their favorite all-time programs. Even making allowances for the prejudices of authors and their mothers, that's an amazing number of software packages to be held in such high esteem.

Once again, it looks as though reports of the death of the Apple II market have been greatly exaggerated. ■

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ALL-TIME TOP THIRTY

Rank	Last Year	Index	
1	1	303.49	**Wizardry**, Andrew Greenberg and Robert Woodhead, Sir-tech
2	25	98.84	**Apple Writer II**, Paul Lutus, Apple Computer
3	2	75.58	**VisiCalc**, Software Arts/Robert Frankston and Dan Bricklin, VisiCorp
4		73.26	**Lode Runner**, Doug Smith, Broderbund
5		68.60	**Ultima III**, Lord British, Origin Systems
6	3	47.67	**Castle Wolfenstein**, Silas Warner, Muse
7	4	44.19	**Choplifter**, Dan Gorlin, Broderbund
8	9	41.86	**Zork I**, Marc Blank, Timothy Anderson, Bruce Daniels, Scott Cutler, Joel Berez, and Dave Lebling, Infocom
9	8	33.72	**Global Program Line Editor**, Neil Konzen, Beagle Bros
10	6	27.91	**Ultima II**, Lord British, Sierra On-Line
11		26.74	**Legacy of Llylgamyn**, Robert Woodhead and Andrew Greenberg, Sir-tech
		26.74	**Pinball Construction Set**, Bill Budge, Electronic Arts
	5	26.74	**ScreenWriter II**, David Kidwell, Sierra On-Line
14	7	25.58	**PFS:File**, John Page and D.D. Roberts, Software Publishing
15		24.42	**Multiplan**, Microsoft
	26	24.42	**WordStar**, MicroPro
17		19.77	**Bank Street Writer**, Gene Kuzmiak and the Bank Street College of Education, Broderbund
		19.77	**Copy II+**, Central Point Software
19	19	18.60	**Graphics Magician**, Chris Jochumson, David Lubar, and Mark Pelczarski, Penguin
20		15.12	**Miner 2049er**, Mike Livesay and Bill Hogue, Micro Lab
		15.12	**Magic Window**, Bill Depew, Artsci
22		13.95	**Adventure**, Crowther and Woods, Microsoft, Apple, and others
		13.95	**Quick File IIe**, Rupert Lissner, Apple Computer
		13.95	**The Coveted Mirror**, Eagle Berns and Holly Thomason, Penguin
25		12.79	**Apple Mechanic**, Bert Kersey, Beagle Bros
26		10.47	**ASCII Express**, Bill Blue and Mark Robbins, United Software Industries
		10.47	**Flight Simulator**, Bruce Artwick, SubLogic
		10.47	**Hard Hat Mack**, Michael Abbot and Matthew Alexander, Electronic Arts
	15	10.47	**Microsoft Decathlon**, Tim Smith, Microsoft
		10.47	**PIE Writer**, Softwest, Hayden

PROGRAMS THAT RECEIVED A FIRST-PLACE VOTE

Programs with no symbol received a first place vote for 1983 only. Programs preceded by a bullet received a first place vote in the All-Time category only. Starred programs received first-place votes in both categories.

APPLE III

• *Apple Writer III*
★*Catalyst*
★*Condor III*
Keystroke Database
★*Quick File III*
★*Think Tank III*
• *VisiCalc III*
★*VisiCalc: Advanced Version*
★*Word Juggler*

APPLE II

★*Accountant*
• *Adventure*
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• *Night Mission Pinball*
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Clipping and Windowing

At last, with HLine completed, we seem ready to actually draw something! As tempting as that might be, we still have some ground-laying that experience has shown makes for a much more powerful graphics package.

Of course, the natural thing for anyone who has finally figured out how the Apple screen is mapped and who has avoided all the pitfalls of programming in assembly language is to go ahead and blast that screen with drawings. We can certainly sympathize—after all that work, the poor programmer deserves a little fun.

In fact, the people who get this far usually indulge themselves by writing a graphics demo or video game to show off what they have accomplished. Sooner or later, though, they realize that there are many operations that are awkward or even impossible in their scheme of things.

The most common mistake made by beginners in graphics is to define the hi-res screen itself as the world in which their graphical objects exist. In such a scheme, it is only possible to talk about points whose coordinates are in the range of 0 to 279 for the X coordinate and 0 to 191 for the Y coordinate. More complicated objects such as lines, rectangles, and polygons are permissible only if all of their points are within these ranges.

To someone who has just spent a couple of weeks figuring out how the Apple hi-res screen works, identifying the picture with the hi-res screen might seem like the most natural approach. This is one of the dangers of fixing attention on the hardware, as we have done in our bottom-up design of HLine: We lose our perspective. Sometimes the hi-res screen does seem like the whole world. . . .

Experience shows that this naive scheme will eventually prove limiting. For example, it won't let us work with pictures that are bigger than the hi-res screen, or with objects that hang off its edges. It also won't let us divide the screen up into logically separate pieces, a feature central to the Macintosh and Lisa user interface.

A Graphical Universe. We would like to incorporate these features into our graphics package. To do this, we will have to take a few steps away from our Apple's hi-res screen and define a more abstract world for our graphical objects. This month's column is about this world, and about how we will convert objects in it into objects that can be drawn on the hi-res screen.

There's an infinite number of possible worlds that we could define to contain our points, rectangles, and polygons. If we were writing an arcade video game, we would probably define the simplest world we could get away with. We might adopt a two-dimensional space and use a pair of eight-bit numbers to represent the horizontal and vertical location of points in it. If we were writing a flight simulator, on the other hand, two eight-bit coordinates just wouldn't do. In that case we would have to create a more detailed three-dimensional world, where points would be defined as sets of three numbers of sixteen or thirty-two bits each.

Since we are writing a general graphics package, we have to walk a middle path, providing enough detail to allow most applications to work, but not so much that memory and processor are quickly exhausted. Since few programs use three-dimensional objects, we will define our graphics world to be two-dimensional. Furthermore, we will define the coordinates in this world to lie in the range from -32,768 to 32,767. In other words, the coordinates of points in our world are sixteen-bit signed numbers. See figure 1 for a picture of our graphics world.

Our choice would seem to rule out the possibility of ever doing three-dimensional graphics, but this is not the case. We will be able to extend our package so that three-dimensional objects and operations on them are possible. Our strategy will be to create a general two-dimensional package and then define a special addition that will break three-dimensional objects down into two-dimensional pieces, which can then be drawn by the general package.

There is another advantage in our choice of a graphics world: It is the same size as a GrafPort on Macintosh and Lisa. This will make the transfer of software and pictures between the Apple II/III and Apple 32 families that much easier.

A Window on Our World. We have defined a world that is much too big to fit all at once on the hi-res screen. How do we decide which part should be visible and where it should appear on the screen? Deciding what is visible is called *clipping*. Drawing the results of the clipping operation on a specific part of the screen is called *windowing*.

We will perform these two operations relative to rectangles. What this means is that we will define a *clipping rectangle*, which lies in our graphics world and determines the visible parts, and a *windowing rectangle*, which lies in the screen world and determines where things actually get drawn. These two rectangles lie in logically different spaces, but they are the same size and can be thought of as being coincident. Together, they define a window on our world. Figure 2 illustrates the situation.

The simplest object to clip is a point, which as we stated earlier is specified by two sixteen-bit numbers, its X and Y coordinates. To draw a point in our window, we first check that it is inside the clipping rectangle (clip). If it is, we convert its world coordinates into physical screen coordinates (window) so the correct pixel can be changed. This process is illustrated in figure 3.

A more commonly drawn object is the rectangle, which we can define using a pair of points. The first point stands for the rectangle's top left corner, while the second stands for its bottom right corner. A point can

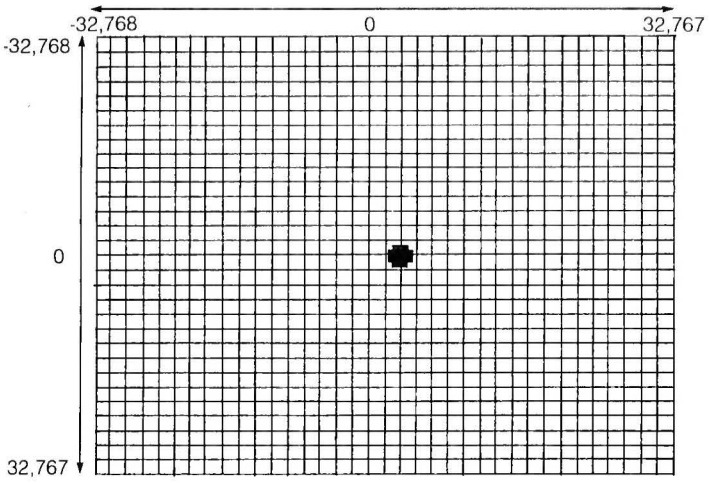


Figure 1. The graphics world.

be thought of as a special case rectangle, a rectangle of exactly one pixel. We will therefore concentrate on the problem of drawing the rectangle, since we can then apply our solution to rectangles and points.

Let us follow the process of drawing a rectangle in this new environment. The first step is to decide if the rectangle is visible at all. We do this by comparing its coordinates against the coordinates of the clipping rectangle (remember that a rectangle consists of two points, or four coordinates). If we can reject the rectangle on the grounds that it lies entirely outside the clipping rectangle, we will do so at this point.

If the rectangle cannot be so rejected, we must determine whether or not it intersects any edges of the clipping rectangle. If it doesn't, we can proceed to the next step. If it does, we have to cut off those parts that are invisible—that is, outside of the clipping rectangle. A nice property of rectangles is that this cutting always results in another rectangle. Figure 4 illustrates some of the different cases.

The result of all this is a rectangle that lies entirely within the clipping rectangle. All that remains at this point is to translate this rectangle from world coordinates into screen coordinates, which we do via simple arithmetic. For each of the two points of the result rectangle, we subtract the top left point of the clipping rectangle and add the top left point of the window rectangle. For a visual interpretation of this translation process, see figure 5.

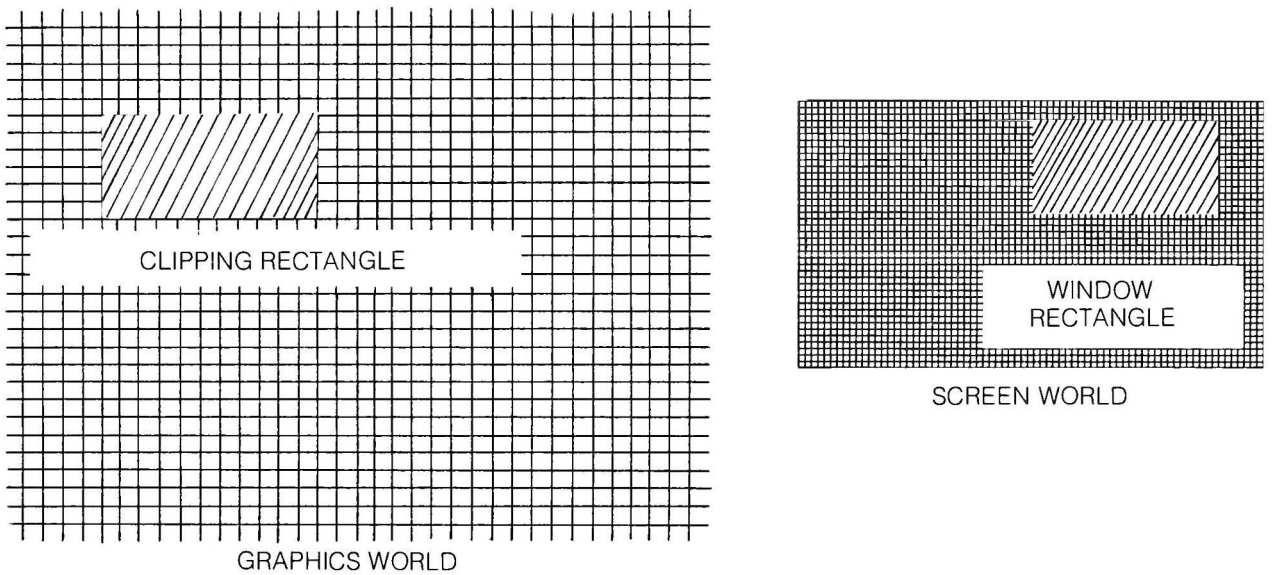


Figure 2. The clipping and window rectangles.

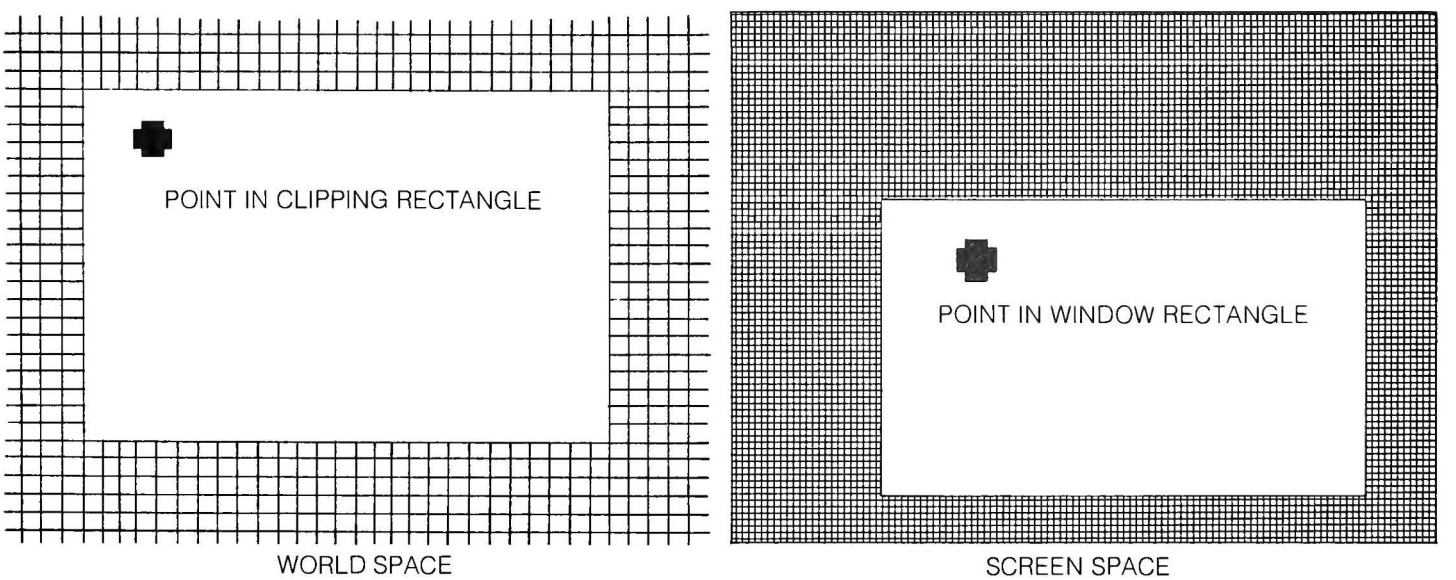


Figure 3. Clipping and translating a point.

This adjustment puts both points of the clipped rectangle on the screen, so we can draw it with HLine (see last month's column for the code). We can shorten this calculation, which has to be performed every time a rectangle is clipped and drawn, by subtracting the top left point of the clipping rectangle from the top left point of the windowing rectangle. This combined number is then added to any rectangle to put it into screen space. Since changing the clipping and windowing environment is usually less common than a drawing operation, this optimization will save a lot of time.

(*) **The Implementation of ClipRect.** Compared with HLine, the programs to clip and translate rectangles are straightforward. We will be assuming that the rectangle to be clipped is in the variables xl, yl, x2, and y2, which hold the four sixteen-bit coordinates. Similarly, the clipping rectangle is held in clipx1, clipy1, clipx2, and clipy2. The windowing rectangle is not required explicitly in the clipping process—the only time we used it was in the translation of coordinates prior to drawing, and then only in an implicit form (combined with the clipping rectangle). We will assume that this combined value is stored in the variables viewx and viewy.

One further note: During the clipping process, information becomes available about which edges of the subject rectangle have to be clipped, and by how much. Because some higher-level operations find this information very handy, we will save it. See the source listing for more of the specifics.

Next month: Going Cartesian—operations with rectangles.

```
51E5:                  138 ; Clip a rectangle: A,X - > rectangle
51E5:                  139 ;
51E5:A0 07             140 ClipRect    ldy  #7          ;get rectangle into x1,x2,y1,y2
51E7:20 AF 51          141 ClipRectB   jsr  GetRectB    ;entry for bitmap drawing
51EA:C8                142             iny              ;Y = 0 (clipping result)
51EB:                  143 ;
51EB:                  144 ; fast rejection of invisible rectangles
51EB:                  145 ;
51EB:A5 C3             146 ClipRectC   lda  clipx2+1    ;check left coordinate
51ED:C5 70             147             cmp  x1+1
```

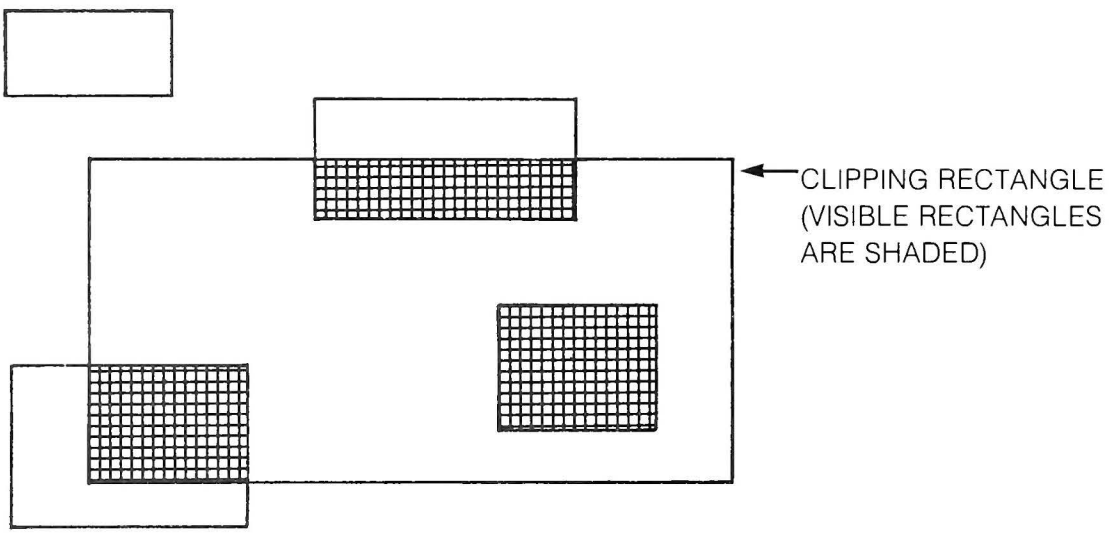


Figure 4. Clipping rectangles against a rectangle.

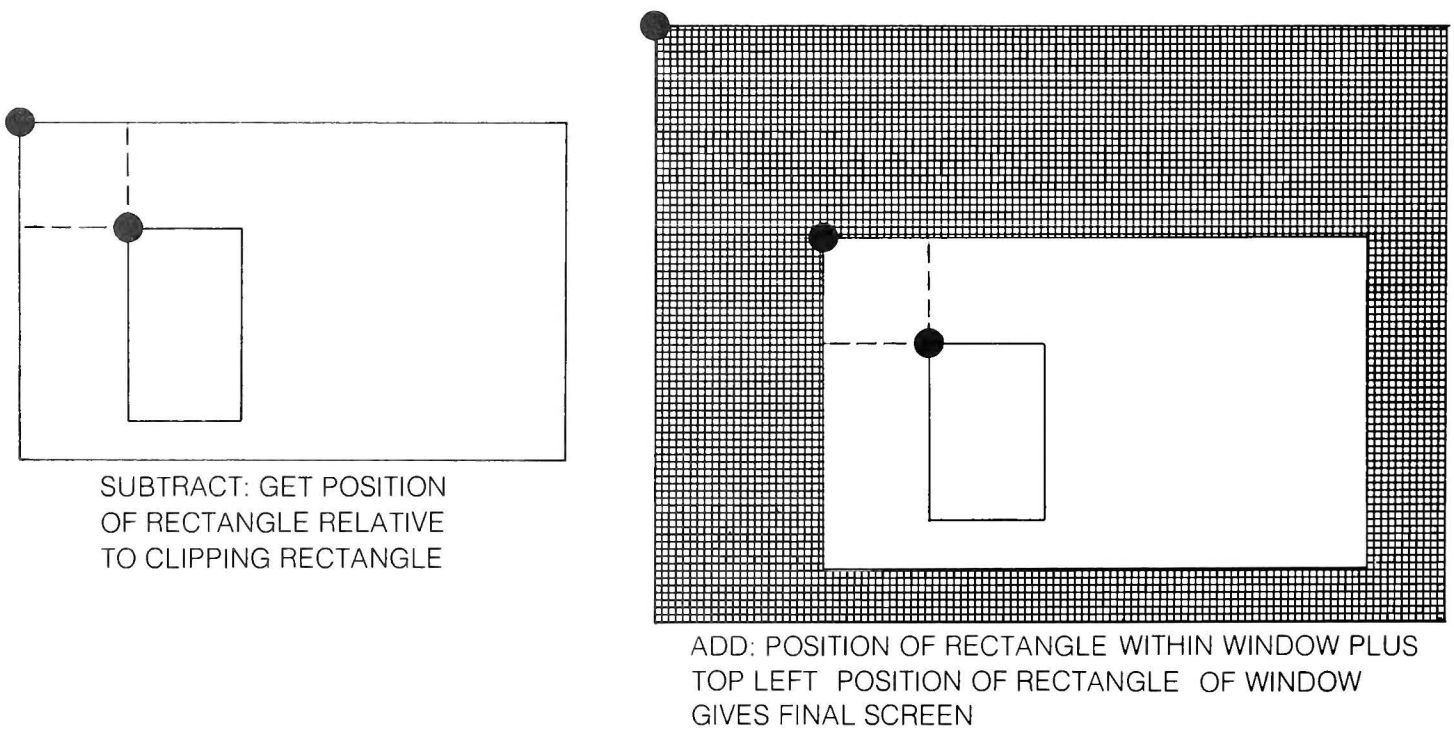
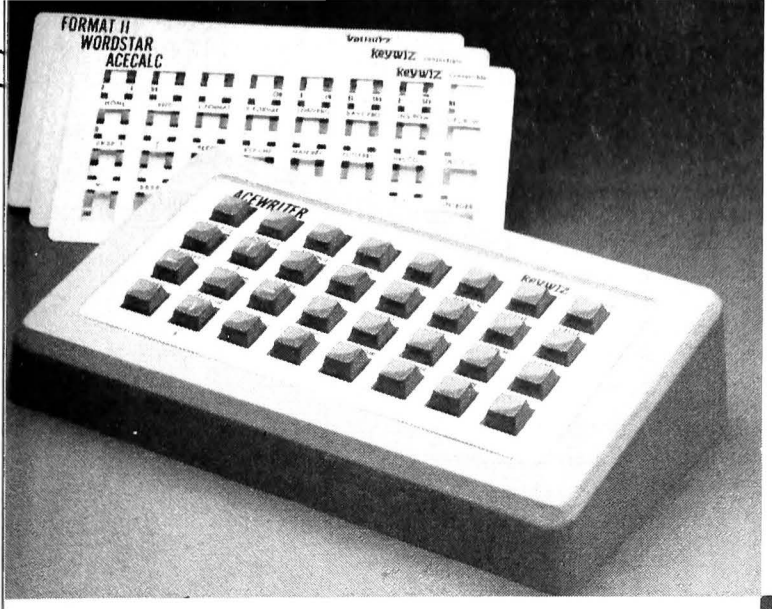


Figure 5. Mapping a clipped rectangle to the screen.



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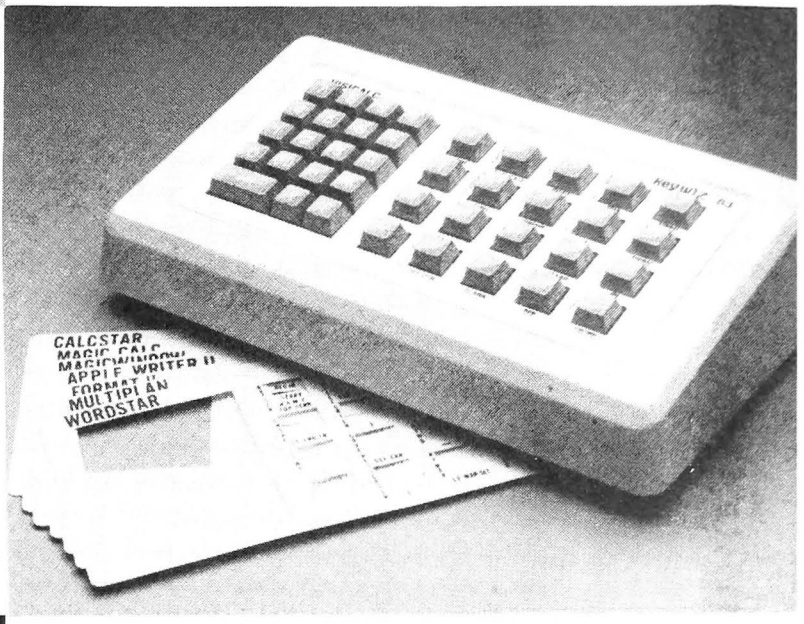
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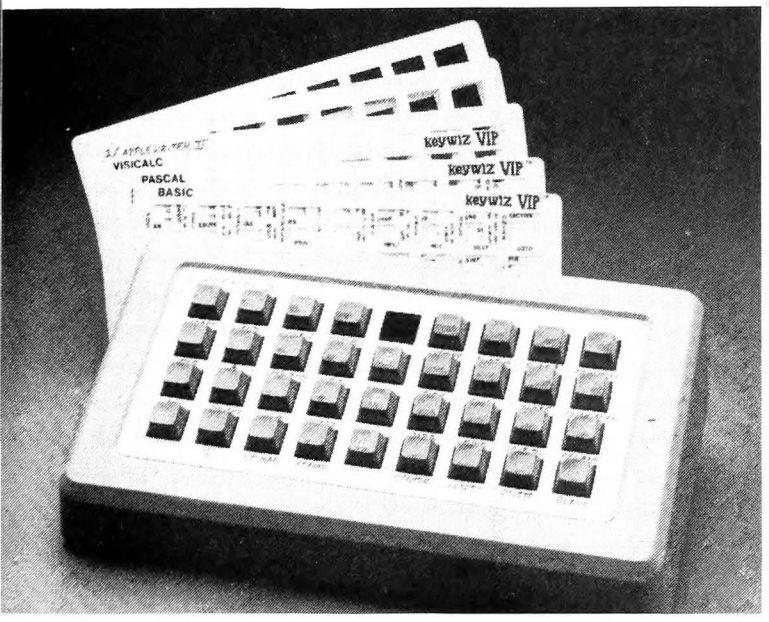
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```
51EF:30 08 51F9   148             bmi  ClipRct.1
51F1:D0 08 51FB   149             bne  ClipRct.3
51F3:A5 C2        150             lda  clipx2
51F5:C5 6F        151             cmp  x1
51F7:B0 02 51FB   152             bcs  ClipRct.3
51F9:18           153 ClipRct.1   clc              ;rectangle is invisible

51FA:60           154 ClipRct.2   rts
51FB:             155 ;
51FB:A5 74        156 ClipRct.3   lda  x2+1        ;check right coordinate
51FD:C5 BF        157             cmp  clipx1+1
51FF:30 F8 51F9   158             bmi  ClipRct.1
5201:D0 06 5209   159             bne  ClipRct.4
5203:A5 73        160             lda  x2
5205:C5 BE        161             cmp  clipx1
5207:90 F1 51FA   162             bcc  ClipRct.2
5209:             163 ;
5209:A5 C5        164 ClipRct.4   lda  clipy2+1    ;check top coordinate
520B:C5 72        165             cmp  y1+1
520D:30 EA 51F9   166             bmi  ClipRct.1
520F:D0 06 5217   167             bne  ClipRct.5
5211:A5 C4        168             lda  clipy2
5213:C5 71        169             cmp  y1
5215:90 E3 51FA   170             bcc  ClipRct.2
5217:             171 ;
5217:A5 76        172 ClipRct.5   lda  y2+1        ;check bottom coordinate
5219:C5 C1        173             cmp  clipy1+1
521B:30 DC 51F9   174             bmi  ClipRct.1
521D:D0 06 5225   175             bne  ClipRct.6
521F:A5 75        176             lda  y2
5221:C5 C0        177             cmp  clipy1
5223:90 D5 51FA   178             bcc  ClipRct.2
5225:             179 ;
5225:             180 ; clip rectangle to clipping rectangle
5225:             181 ;
5225:A5 6F        182 ClipRct.6   lda  x1           ;(Y = 0) do left edge
5227:38           183             sec
5228:E5 BE        184             sbc  clipx1
522A:AA           185             tax
522B:A5 70        186             lda  x1+1
522D:E5 BF        187             sbc  clipx1+1
522F:10 0D 523E   188             bpl  ClipRct.7
5231:             189 ;
5231:86 7F        190             stx  clipdx1     ;save distance off-screen
5233:85 80        191             sta  clipdx1+1
5235:A5 BE        192             lda  clipx1      ;clip edge
5237:85 6F        193             sta  x1
5239:A5 BF        194             lda  clipx1+1
523B:85 70        195             sta  x1+1
523D:C8           196             iny              ;set clip result bit
523E:             197 ;
523E:A5 C2        198 ClipRct.7   lda  clipx2      ;do right edge
5240:38           199             sec
5241:E5 73        200             sbc  x2
5243:AA           201             tax
5244:A5 C3        202             lda  clipx2+1
5246:E5 74        203             sbc  x2+1
5248:10 10 525A   204             bpl  ClipRct.8
524A:             205 ;
524A:86 83        206             stx  clipdx2
524C:85 84        207             sta  clipdx2+1
524E:A5 C2        208             lda  clipx2
5250:85 73        209             sta  x2
5252:A5 C3        210             lda  clipx2+1
5254:85 74        211             sta  x2+1
5256:98           212             tya
5257:09 04        213             ora  #$04
5259:A8           214             tay
525A:             215 ;
525A:A5 71        216 ClipRct.8   lda  y1           ;do top edge
525C:38           217             sec
525D:E5 C0        218             sbc  clipy1
525F:AA           219             tax
5260:A5 72        220             lda  y1+1
5262:E5 C1        221             sbc  clipy1+1
5264:10 0E 5274   222             bpl  ClipRct.9
5266:             223 ;
5226:86 81        224             stx  clipdy1
5268:85 82        225             sta  clipdy1+1
526A:A5 C0        226             lda  clipy1
526C:85 71        227             sta  y1
526E:A5 C1        228             lda  clipy1+1
5270:85 72        229             sta  y1+1
5272:C8           230             iny
5273:C8           231             iny
5274:             232 ;
5274:A5 C4        233 ClipRct.9   lda  clipy2      ;do bottom edge
5276:38           234             sec
5277:E5 75        235             sbc  y2
5279:AA           236             tax
527A:A5 C5        237             lda  clipy2+1
527C:E5 76        238             sbc  y2+1
527E:10 10 5290   239             bpl  ClipRct.10
5280:             240 ;
5280:86 85        241             stx  clipdy2
5282:85 86        242             sta  clipdy2+1
5284:A5 C4        243             lda  clipy2
5286:85 75        244             sta  y2
5288:A5 C5        245             lda  clipy2+1
528A:85 76        246             sta  y2+1
528C:98           247             tya
528D:09 08        248             ora  #$08
528F:A8           249             tay
5290:             250 ;
5290:84 7E        251 ClipRct.10  sty  cliprslt     ;cliprslt = 0000brtl
5292:60           252             rts              ; (bottom,right,top,left)
5293:             253 ;
5293:             254 ; Translate from window space to screen space
5293:             255 ;
5293:A2 03        256 XlatRect    ldx  #3          ;DMoveRect by view x,y
5295:B5 BA        257 XlatRct.1   lda  viewx,x
5297:95 6B        258             sta  dx,x
5299:CA           259             dex
529A:10 F9 5295   260             bpl  XlatRct.1
529C:             261 ;
529C:             262 ; Translate rectangles
529C:             263 ;
529C:A5 6B        264 DMoveRect   lda  dx
529E:18           265             clc
529F:65 73        266             adc  x2
52A1:85 73        267             sta  x2
52A3:A5 6C        268             lda  dx+1
52A5:65 74        269             adc  x2+1
52A7:85 74        270             sta  x2+1
52A9:A5 6D        271             lda  dy
52AB:18           272             clc
52AC::65 75       273             adc  y2
52AE:85 75        274             sta  y2
52B0:A5 6E        275             lda  dy+1
52B2:65 76        276             adc  y2+1
52B4:85 76        277             sta  y2+1
52B6:             278 ;
52B6:A5 6B        279 DMovePoint  lda  dx
52B8:18           280             clc
52B9:65 6F        281             adc  x1
52BB:85 6F        282             sta  x1
52BD:A5 6C        283             lda  dx+1
52BF:65 70        284             adc  x1+1
52C1:85 70        285             sta  x1+1
52C3:A5 6D        286             lda  dy
52C5:18           287             clc
52C6:65 71        288             adc  y1
52C8:85 71        289             sta  y1
52CA:A5 6E        290             lda  dy+1
52CC:65 72        291             adc  y1+1
52CE:85 72        292             sta  y1+1
52D0:60           293             rts
```


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EVERYONE'S GUIDE TO ASSEMBLY LANGUAGE



BY JOCK ROOT

Writing a Program

You have probably heard that the Monitor program is a useful tool for writing programs in assembly language; but knowing that it's useful is not the same as knowing how to use it. The best way to learn to use something is to watch somebody else use it, and then try it yourself; so this month we have an example for you to watch.

For this example, we will write a program to output a message to the screen. You can use this technique in your own assembly language programs to send messages to the user; or you can call this routine from Basic to output a preset message.

Program Design. How do you design an assembly language program? The same way you design anything: You start by looking over the resources you have and the ways in which they can be combined to produce various results; and you try to find a combination that will produce the result you want. In this case, the resources we have are the commands of assembly language.

To begin with, we'll take advantage of a freebie: There's something we can add to our list of resources that will make the job a lot easier. We can use the Monitor program itself as a resource. It contains a vast library of subroutines, which we can use as part of our own program. If you follow the rules, you can "borrow" any Monitor routine you want.

What we want to do is to output a message: as you would say in Applesoft, to "print a string." We will borrow the Monitor routine for single-character output, which is the same routine Applesoft itself uses for that purpose. The name of the routine is COUT (for "character output"), and its address is $FDED (we'll explain that later).

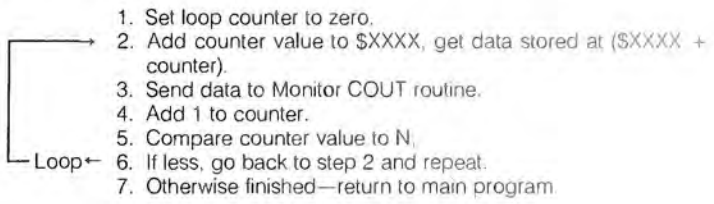
What To Do Next. A computer program is a list of instructions: a logical sequence of steps that will produce the desired result. Before we can write that sequence of instructions in computer language, we have to understand it clearly in human language; so we'll start by writing out the *algorithm*, or logical procedure, for our program.

Designing the algorithm is usually the hardest part of writing a program, so we'll take it slowly at first. What do we want this procedure to accomplish? Earlier, we said "to output a message to the screen"; but you can't say that in assembly language, because there's no word for "message." Assembly language doesn't have the concept of "strings." We have to be more specific than that, and describe our message in terms of memory addresses.

One way to do that is to store the message in a particular section of memory and then tell the Apple, "Output the contents of N successive memory locations, starting at address $XXXX." That's the way you have to say things in assembly language.

But that isn't an algorithm yet. It's clear, but it isn't detailed enough: It says what to do, but it doesn't say how. We still have to put in a loop, and a loop counter, and a loop counter test. There isn't space to explain all of that here; but if you want all the gory details, check out the August 1983 installment of this column. In that article, we described a similar program and did a step-by-step comparison with the same thing in Basic.

To make a long story short, our algorithm is shown in the accompanying figure.



String output algorithm. $XXXX is the starting address of the message in memory, and N is the number of characters in the message.

Translating It. Already our algorithm is beginning to look like a program. It's shaped like a program, with line numbers and everything; only the words are different. And that's no accident: the main purpose of an algorithm is to bridge the gap between the human concept of a process (in this case, "output a message") and the machine "concept" of the same process (the program we want to write).

In fact, this algorithm is structurally identical to our assembly language program—in other words, it's shaped exactly right. We can make it into an assembly language program just by putting in the right words. If we count loops with the X register and use the label MSG to represent the starting address of the message in memory, it looks like this:

```
1          LDX   #0      (set counter to zero)
2  LOOP    LDA   MSG,X   (get data from MSG + counter)
3          JSR   COUT    (send data to COUT routine)
4          INX          (add 1 to counter)
5          CPX   #N      (compare counter to N)
6          BCC   LOOP    (if counter < N, repeat)
7          RTS          (otherwise done, so return)
```

This is not yet a complete program. Before we can assemble and run it, we will have to fill in specific numbers for MSG and COUT, as well as some other things. But the logical structure of the program is complete and final; and (as you can see by comparing line numbers) it matches the algorithm exactly. Aside from the difference in symbols, the listing and the figure are identical.

Specific Numbers. We are about to add those missing numbers; but before we do that, we should explain a couple of the funny symbols we've been using. First, the dollar sign ($): In this context it has nothing to do with money. Instead, it indicates a *hexadecimal* number: a number to the base 16, instead of the base 10 that we normally use (*decimal* numbers). In hexadecimal, you count 0 1 2 3 4 5 6 7 8 9 A B C D E F ($F equals decimal 15) and then 10 ($10 equals decimal 16).

Next, the # symbol (lines 1 and 5). This is an assembly language code mark that identifies the following number as an "immediate value" instead of an address. In assembly language, when you put a number after a command like this, the number usually represents an address in memory where the number you really want is stored. If you want the program to use the given number as a *value* instead of an *address*, you have to put a # mark in front of the number.

Now that we know what we're talking about, we can start putting in some real numbers. First, we have to tell the program where COUT is in memory: We have to define the label COUT by its memory address, $FDED. Next we have to specify N, the number of characters in the message. For this example, we'll make N equal 5, and have the program say, "Oops!" (you can use it for the beginning of an error message).

What else do we need? We need MSG: where in memory will our message begin? Well, the obvious place would be right after the program; but that doesn't tell us much, because we don't know where the program itself is yet!

And that's the most important missing number of all: the *origin*, or starting address in memory of the program itself. You cannot even begin to assemble a program (that is, convert it into machine language) until you specify its location in memory, because some of the machine language values are determined by memory addresses.

To complicate the problem, you have to be careful about which memory area you use. The Apple has already assigned most of its memory space to various specific uses, and you don't want to overwrite anything important (like DOS, for instance).

So how do you choose an origin? For today, do it the easy way and take the one we give you. This will put your program in a kind of "experimenter's workspace" of 230 bytes, which was left by the designers of the Apple for us to play in. Start your program at $300, which is 768 decimal.

Now we have N and the origin, but we don't have MSG yet. However, we do have enough to start assembling our program. It's enough for now to say that MSG will be the first free address after the program itself; we can fill in the specific number later, when we know how long the program is. If we add a couple of spacers (zero bytes) to separate the message from the program, it will look like this:

```
 1          ORG   $300      (start program at address $300)
 2 COUT     =     $FDED     (address of Monitor routine COUT)
 3 N        =     5         (number of characters in message)
 4          LDX   #0        (set counter to zero)
 5 LOOP     LDA   MSG,X     (get data from MSG + counter)
 6          JSR   COUT      (send data to COUT routine)
 7          INX             (add 1 to counter)
 8          CPX   #N        (compare counter to N)
 9          BCC   LOOP      (if counter < N, repeat)
10          RTS             (otherwise done, so return)
11          BRK             (spacer)
12          BRK             (spacer)
13 TAB      ASC   "OOPS!"   (message)
```

Assembling It. Now that the assembly language version of our program is finished, we can assemble the machine language version. That will be a series of two-digit hex numbers, or *bytes*, which represent electronic signals. These are the signals that will control the microprocessor (the "brain" of your Apple) while it is running our program.

The assembly language program serves as a pattern, or template, on which to assemble the machine language program. That's where the name "assembly language" comes from: In the early days of computers (before Basic), assembly language was created to give us a "humanized" version of machine language. We can design a program using the "words" of assembly language (LDX, STA, and so on) and then convert the result into machine language by a simple assembly process.

However, in this case *simple* does not mean *easy*: if you've ever assembled a program "by hand," you know it can be a difficult process. In this case, *simple* means (loosely translated), "We can write a program to do it for us." That's the way programmers think.

Thus there are two ways you can assemble a program: either by hand—which means a lot of looking things up in charts and tables, as well as doing calculations in hexadecimal arithmetic—or by machine, using an assembler program. We will explore these two techniques some other day: For now, we will simply assemble it and give you the result.

```
                        1  ********************
                        2  *                  *
                        3  *                  *
                        4  *     MSG OUT      *
                        5  *                  *
                        6  *      < 3 >       *
                        7  *                  *
                        8  ********************
                        9
                       10
                       11          ORG  $300      START PROGRAM AT ADDRESS $300
                       12
                       13  COUT  =    $FDED     ADDRESS OF MONITOR ROUTINE COUT
                       14  N     =    5         NUMBER OF CHARACTERS IN MESSAGE
0300: A2 00            16          LDX  #0        SET COUNTER TO ZERO
                       17
0302: BD 10 03         18  LOOP    LDA  MSG,X     GET DATA FROM MSG + X
0305: 20 ED FD         19          JSR  COUT SEND DATA TO COUT ROUTINE
0308: E8               20          INX  .         INCREMENT COUNTER
0309: E0 05            21          CPX  #N        COMPARE COUNTER TO N
030B: 90 F5            22          BCC  LOOP      IF LESS, REPEAT FROM "LOOP"
                       23
030D: 60               24          RTS  .         ELSE FINISHED: RETURN
                       25
030E: 00               26          BRK  .         (SPACER)
030F: 00               27          BRK
                       28
0310: CF CF D0
0313: D3 A1            29  MSG     ASC  "OOPS!"   (MESSAGE)
                       30
0315: 00               31          BRK  .         (SPACER)
0316: 00               32          BRK
```

Machine Language. The only important difference between this and the previous versions is that a bunch of numbers have been added to the left of the line numbers. These new numbers comprise the machine language program and the addresses where it will be stored. Note that all of these numbers are in hexadecimal, even though no dollar signs are used.

There are actually two sets of numbers. On the far left is a column of four-digit hex numbers, each followed by a colon (starting with 0300 in line 16). These are memory addresses and begin at $300, because that was where we set the origin of our program.

Between the addresses and the line numbers are several two-digit hex numbers in an irregular pattern: These are the bytes of machine code. When the program is stored in memory, these numbers will become electronic signals; when it runs, these signals will be sent to the microprocessor, one after another.

The arrangement of these numbers looks irregular, but it's actually very precise. To begin with, only the lines with addresses on them (such as 0300) are important. The others are simply blanks, included to clarify the logic. Also, any line that begins with an address will have at least one, and not more than three, bytes of code on it.

The address on each line is the memory location where the first byte on that line will be stored; the other bytes on that line (if any) will go into successive locations. If you compare the addresses of successive lines, you will see that they are just the right distance apart.

The byte(s) of code that follow each address are a direct translation of the assembly language command on that line. In the first line of the program (line 16 of the listing), $A2 is machine language for LDX (immediate), and $00 is #0.

In the third line, line 19 of the listing, $20 is machine language for JSR, jump to subroutine—the equivalent of gosub in Basic. The next two bytes are the target address, $FDED—but in reverse order, sometimes called "low byte first." We'll explain about "high byte" and "low byte" another day; it has to do with microprocessor address formats, and it's a bit weird. For now, just remember that in machine language, addresses usually have the bytes in reverse order.

Now that you know about that, you can figure out the second line of the program (line 18 of the listing). The first byte, $BD, is machine language for LDA (indexed by X); and the other two bytes, $10 $03, are the target address, the address of MSG. It's in reverse byte order, of course; so the actual address of MSG is $0310.

And so it is. Consider line 29, which gives the message itself. At first glance, this line seems to begin at address $0313; but that's only the second half of it. It really begins at $0310; but since it takes five bytes (one

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The KEYPORT 717 is an advanced technology keyboard with 717 touch-sensitive function keys. These keys allow the commands for a specific application to be placed in front of the user in colorful graphics. Each application has its own KEYPORT overlay.

KEYPORT 717 SPECIFICATIONS

No. of keys	717
Shift keys	2
Size of overlay	11″ × 24″
Size of case	12″ × 25″ × 2″
Connector	9 Pin or 16 Pin DIP
Cable length	5 to 50 feet

The KEYPORT can assign an entire command, or string of commands, to a single key. This greatly increases user and programmer efficiency, and decreases the frequency of syntax errors. A graphic overlay designates which of the 717 keys are activated, and these keys are logically grouped and color coded to organize workflow and increase user concentration. A booter diskette is linked to the overlay, and activates the particular set of keys.

The KEYPORT 717 does not disable the standard keyboard. It is connected to the computer via the game port to allow both the keyboard and the KEYPORT to be used concurrently.

POLYTEL's initial software packages include frequently used and popular programs (BASIC Programming, VISICALC, and THE FARM) with word processing and other programs coming soon. Your **productivity** will grow while using the **affordable** KEYPORT system.

BASIC PROGRAMMING

The BASIC Programming overlay includes keys for all BASIC and DOS commands PLUS features like AUTO-LINE NUMBER, four-directional non-destructive cursor for editing, AUTO-REPEAT for all keys, user definable keys, COLOR keys, and more.

VISICALC

The VISICALC overlay includes all numeric, formatting, and text capabilities in an easy-to-use layout. Spreadsheet construction and labeling is now easier through the use of grouped and understandable single key commands. Other features include eight directional cursor control, printing macros, user definable keys, and a screen memory map for one-stroke cursor positioning.

EDUCATION

THE FARM is the beginning of an exciting educational line of software packages. This extremely colorful overlay has a farmyard scene in which your children can identify farm animals, ask questions, play games, or even write a story about the experience.

PROGRAMMERS

The KEYPORT 717 is not only super User Friendly, but also Programmer Friendly. In addition to using the packages described above, you can design your own applications and overlays around the KEYPORT. New applications can be programmed easily, without menus and syntax analysis, because every function can be associated to a unique key.

Every KEYPORT comes complete with a set of software tools and two template programmer overlays to help you custom design a KEYPORT overlay for new or existing programs. Potential applications include business, home use, education, process control, and automation.

Copyright protection for your program is enhanced by requiring the custom overlay for its use.

SYSTEM REQUIREMENTS

At present, the KEYPORT 717 is compatible with the APPLE II, II+, and IIe. A 48K memory and one disk drive is required. No interface card needed. The cable, booting diskette, programmer overlays, and BASIC Programming package are included with every KEYPORT 717.

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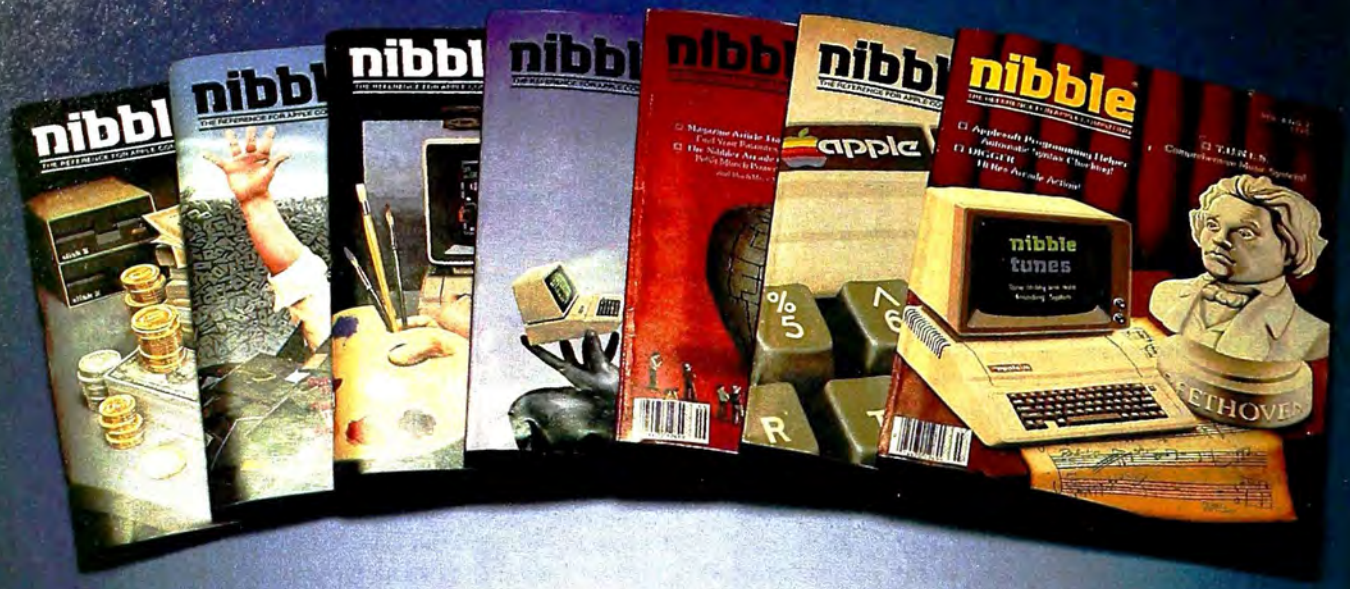
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for each character), and this assembler format only allows three bytes per line, it spilled over from the line above.

But we haven't space to explain each line. There's only one more point that needs to be made before we can enter this thing into memory and see if it runs.

You may have noticed something peculiar about the hex values used for the characters in the message. For example, the ASCII value given for S in the Apple manuals is $53 (83 decimal), but we use $D3 (211 decimal). If you want to use a different message, you must add $80 (decimal 128) to the ASCII value of each character when you convert it into machine language; otherwise the Apple will display it in flashing format instead of normal. This is because of a quirk in the Apple display system, which we may explain some other day.

Loading the Program. Now that we have the complete program on paper, the next step is to store it in the Apple's memory and see if it runs. To do that, we will need the Monitor program, so turn on your Apple and type *call −151*. This will get you the * Monitor prompt: that means the Monitor is now ready to accept instructions.

Type in the first address, *300* (you can include or omit the leading zero, as you prefer, but *don't* include a dollar sign!). Then type a colon, followed by the first byte of code, *A2* (don't include any spaces yet). Next, type a space and then the second byte of code.

That uses up the first line, but you don't have to stop there. Type another space and then the third byte of code, *BD*. Don't type in the next address—the Apple already knows where you are, and the extra numbers would only confuse it. Keep going like this for a few more bytes—typing in bytes and spaces alternately—until you've entered two or three lines, and then press return.

On the next line, you don't have to start with an address. Just type a colon after the prompt and keep going from where you left off, byte-space-byte-space, and so on. Keep this up until you have entered the whole program. That's all there is to it. The program is now in memory and ready to run!

If that description isn't clear, refer to last month's column, where we described the process in more detail; or see the *Apple II Reference Manual* section on the Monitor.

Final Check. Before we take the final step of running it, let's see if the Apple understood what we were trying to say. The Monitor has a list command that will display the contents of memory in the form of an assembly language listing. We can use that to see if our message got across.

Since we started our program at address $300, we want a listing starting at that address. The command for that is *300L* (no dollar sign, no spaces). Type that in, followed by return, and you should get a screen that looks like this display:

```
*300L
0300-  A2  00      LDX  #$00
0302-  BD  10  03  LDA  $0310,X
0305-  20  ED  FD  JSR  $FDED
0308-  E8          INX
0309-  E0  05      CPX  #$05
030B-  90  F5      BCC  $0302
030D-  60          RTS
030E-  00          BRK
030F-  00          BRK
0310-  CF          ???
0311-  CF          ???
0312-  D0  D3      BNE  $02E7
0314-  A1  00      LDA  ($00,X)
0316-  00          BRK
```

Actually you will get more than that—another half dozen lines; but you can ignore that stuff, since it won't affect our program. This is a very primitive sort of listing; it doesn't have labels, and it doesn't have line numbers. What it does have is structure: The assembly language commands should match, line by line, with the program you entered. If anything doesn't match, in the display you get, you had better check your work—you probably made a typo somewhere.

Don't expect the message to make any sense, in this form; the Apple was trying to interpret it as a series of instructions, and of course the result was gibberish.

Running It. Now that we've done all the preliminary testing we can, it's time to take the final plunge. We have to start feeding our instructions to the microprocessor, and see if it does what we want in response.

We do that with another Monitor command, G for go. As usual, we have to put in the address before the command itself, so the complete form is *300G* followed by return. Go ahead. . . .

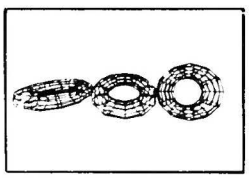
Don't be disconcerted when the machine says, "OOPS!" After all, that's what we asked it to do. Now that you know the rules, you can put in your own message. Don't forget to add $80 to all the ASCII values, unless you want a flashing message.

In order to use this routine from within an assembly language program, use the JSR command: JSR $300. The technique for calling it from a Basic program is much the same, but the words are different: The command is *call* instead of JSR, and the address has to be in its decimal form, which is 768. From Basic, the command is *call 768*.

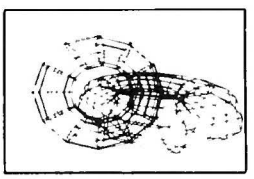
You might want to experiment with things like adding a carriage return character ($0D in normal ASCII, $8D in our "plus $80" format) before the message, to skip a line. Play around with various characters, and see what happens. If the Apple starts doing crazy things (like refusing to accept input and scrolling gibberish madly up the screen), don't worry, just press reset and start over. If even reset won't stop it, simply turn the Apple off and back on again. ■

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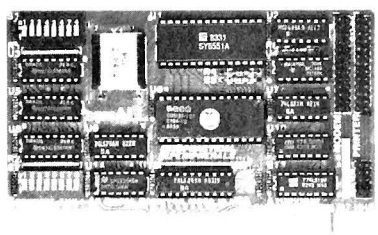
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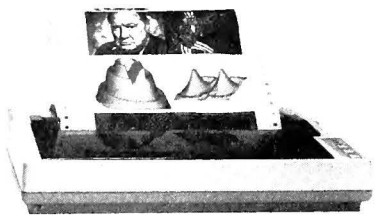


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Mind Your Business

BY PETER OLIVIERI



Communications Fundamentals, News and Musings

As we move ahead in the computer age, the ability to communicate with other computers will become more and more important to us. Personal computers will serve as local workstations through which we'll retrieve data from databases, perform spreadsheet analysis, and do word processing. On many occasions, we'll need to interact with larger computers. Sometimes this need arises because a certain larger machine provides us with additional computing power or software. More often, however, we'll want to interact with these larger machines because they are the "hosts" of large database systems we wish to use. These may be systems that provide us with access to catalog shopping services, educational testing and practice activities, encyclopedias, information on major corporations, news stories, magazine articles, local bulletin boards, job search capabilities, and much more.

The ability to communicate with a variety of different hosts is one that a great many business users would welcome enthusiastically. It would mean that professionals could hook up to their company's main computer while working at home. A businessperson who was renting time on a mainframe might realize significant cost savings by working with a personal computer that only accessed the main machine when necessary.

Communicating about Communications. Like any new area, microcommunications requires that users learn a new vocabulary. Without getting too technical, let's review a few of the terms you'll need to understand in order to feel at home.

Before communication with another computer can take place, a microcomputer must have a device called a *modem*, which connects your microcomputer to the telephone. A modem comes either as a card that plugs into one of your Apple's peripheral slots or as an external device. Some modems plug into the telephone jack, others require that you place the telephone receiver inside a device called an *acoustic coupler*.

Information transfer via modem takes place over the already existing telephone lines. Since telephone lines do not understand digital signals, however, the computer signals must be *modulated*—translated into a form the telephone lines can accept, namely sound—before they go across the telephone lines and are *demodulated*—translated into electrical data—before they go back into the receiving computer. Hence the term *modem*.

A modem can send data over the telephone lines *synchronously* or *asynchronously*. Synchronous communication takes place at very high speeds and isn't suitable when ordinary telephone lines are being used; as far as the computer is concerned, it's really pretty slow. An organization that needed to transmit very large amounts of data on a regular basis would choose to transmit data synchronously, not asynchronously.

The most common transmission rates at which data is sent over personal computers are 300 *bits per second* (BPS) and 1200 bits per second. Since it takes eight bits to encode one character (one letter, number, or symbol), 300 bits per second and 1200 bits per second correspond to roughly 30 and 150 characters per second respectively. (By the way, you'll often see transmission speeds expressed in terms of a measurement called *baud*, as in 300 baud and 1200 baud. Don't let this throw you; in this context, BPS and baud are meant to convey the same thing.)

A modem can usually be set to either *half-duplex* mode or *full-duplex* mode. In half-duplex, data can be sent along the line in only one direction at a time. Full-duplex allows information to be transmitted in both directions simultaneously.

A computer has a set of rules it uses to translate bits (those binary digits being sent over the telephone lines) into the actual character the computer will understand. Most microcomputers use the ASCII character set—more formally known as the American National Standard Code for Information Interchange. ASCII is merely a coding scheme that identifies which eight-bit sequence represents which character in the computer's character set. Many large computers, including those manufactured by IBM, use a different encoding scheme. This alternate scheme is called EBCDIC (for Extended Binary Coded Decimal Interchange Code). This is important to you if you have a microcomputer that has the ASCII character set and you wish to communicate with a computer that uses EBCDIC; before this is possible, some translating must take place somewhere, most likely in software.

So, how is it going? You're being presented with a lot of terms, some of which may be new to you. The things we've been talking about here are not really all that complex, but if they're unfamiliar to you, you may want to reread the last few paragraphs before continuing.

Rules, Rules, Rules. As you can see, there's a lot involved in getting data from one place to another. In communications, these rules are known as *protocol*. For the sake of all us poor users, all this complexity is usually handled by someone or something else, most often by software that comes with the modem. (Note: Software for this purpose may also be purchased separately.) For now, we'll refer to this software as a *communications package*.

A particular communications package is usually written for a particular computer; thus, you would normally buy a package that was designed especially for your variety of Apple. Some communications packages turn your Apple into what is called a *dumb terminal*. When your machine is a dumb terminal, it no longer can do the tasks it did before being connected to another computer. It is now merely a communications device. The real limitation here is that you cannot transfer data files back and forth between systems (and being able to do so is most desirable).

Some of the more sophisticated communications packages allow your Apple to be "all that it can be." In addition, they dial the telephone for you and log in your ID number and password for a particular system automatically.

It is important to be sure of your needs before leaping into the communications marketplace. Know the characteristics of the computer or computers you want to communicate with. Also, spend some time identifying what it is you want to be able to do once you succeed in hooking up to another system.

Softerm. While there are simpler communications packages on the market, few are as powerful as *Softerm*, from Softronics. There are two versions of this package. *Softerm 1* is designed for home or business use where access to timesharing and information services such as Dow Jones, The Source, and CompuServe is desired. *Softerm 2* is designed for business or professional users who, in order to have access to a host computer somewhere, require a communications program that exactly emulates some specific terminal.

First, some general comments. The program is menu-driven, with clear instructions on what needs to be done. If you want to make use of all aspects of the package, you'll need to spend a fair amount of time. On the plus side, the company provides very good product support, offering both a user hot line and an on-line service that allows you to dial up for information. On the minus side, the manual, while thorough and comprehensive, is not easy reading.

You may be wondering why a package with a less-than-perfect user guide is being reviewed here. Well, perhaps the fact that you see it here anyway gives you some indication of how good the rest of the package must be.

Softerm is a powerful and unusually flexible program that will emulate many of the major computer terminals while at the same time

allowing you to use your Apple to full advantage. The program runs on any Apple II. Included in the package is a keyboard expander board that goes into one of your Apple's slots. Once this board is installed, you can attach a small keypad to your machine that makes it possible to execute some of the functions of *Softerm* at the press of a key.

Softerm can easily handle the transfer of Apple DOS files, CP/M files, or Pascal files. These capabilities significantly enhance the power of your personal computer.

Another nice feature is the ability to define and record protocols, along with the phone calls that are needed for access to another computer. Up to fifty numbers and communications protocols can be stored for easy and automatic retrieval.

Softerm also allows you to define various keys to represent a sequence of keystrokes that you may have to use again and again. Up to eighteen such sequences—often called *macros*—can be saved to disk. This is an attractive feature most communications packages don't offer.

Many business users are currently using computer terminals in the work environment, so they see the ability to turn their personal Apples into those same terminals as a big plus. *Softerm* provides exact terminal emulation for the following: ADDS Regent 20, 25, 40, 60; ADDS Viewpoint; Data General D200; Datapoint 3601; DEC VT102, VT52; Hazeltine 1400, 1410, 1500, 1520; Honeywell VIP7205; IBM 3101 Model 10 and 20; Lear Siegler ADM-3A, ADM-5; and TeleVideo 910, 925.

If the terminal you use is not listed here, the Softronics on-line system can help you determine what parameters might be needed to make *Softerm* function in your environment.

It bears repeating—newcomers to computers won't have an easy time of it with this manual. However, the benefits that can accrue once users have tailored *Softerm* to their particular computer environment are considerable.

Among the additional features of this package are menu-driven setup procedures, forty- or eighty-column display, support of lower-case adapters, keyboard enhancers, clock cards, and other add-ons, automatic dialing, on-line update service, transmission speeds of up to 9600 BPS, the ability to control the pace of transmission, local printer support, and the ability to copy a screen to disk or to the printer.

If you're serious about using your Apple to communicate with other machines, then you may want to get serious about *Softerm 1* or *Softerm 2*. Why not ask your dealer to give you a thorough demonstration?

Announcements. It's difficult to keep up with the constant barrage of new products, upgrades, publications, and reviews of interest to the business user. Therefore, we'll be using this section to keep readers abreast of some new developments. Depending on the significance these items hold (or perhaps on their interest to readers), we may offer follow-up discussions of them in some future column.

News item number one—Apple has developed a mouse controller for the Apple IIe. The $175 Apple Mouse II can, in some ways, make your machine operate like a Lisa.

The Mouse is packaged with *Mouse Paint* by Bill Budge and a tutorial. *Mouse Paint* provides a variety of fonts, allows the user to draw freehand, and facilitates the insertion of text into charts and drawings. A new 6520 processor on the mouse's interface card reads the mouse's position and communicates with the Apple's 6502.

There's also a new operating system for the IIe called ProDOS. (An operating system is a set of programs that essentially direct the computer; in a very real sense, an operating system significantly enhances the performance of a computer.)

ProDOS, running on any 64K Apple II, uses files that are compatible with Apple III SOS. In addition, it offers users a much better method of file management than DOS 3.3, including the ability to create subdirectories. As you may know, this capability is quite common with some of the sophisticated hierarchical systems, such as Unix and PC-DOS. The major improvement that a more sophisticated system offers is the ability to retrieve files and data rapidly.

This new operating system will also accommodate large disk files that contain as many as sixteen million characters. This, in turn, allows the introduction of the ProFile hard disk for the IIe, as well as a variety of more sophisticated applications programs.

CDEX Corporation, a producer of quality training products, recently announced that Dow Jones and Company has purchased an equity interest in the company. The two firms plan to work together closely in the design and development of various new products. Here's an example of an organization with training and documentation experience linking up with a prestigious business organization. Let's hope that we as business users are the ones who'll ultimately benefit the most.

B.U.G. Help. Kirk Greiner of Ridgefield, Washington, has a request for help from any experienced Apple III users out there. Kirk needs a program that will enable him to maintain personnel information on up to 1,000 consultants. The program he seeks would allow him to input up to ten disciplines for each individual and to sort discipline fields.

Greiner currently uses *Quick File III* and has created two files. The first file contains all the personnel information (without the disciplines), while the second holds four-field records for each discipline (the fields are discipline, last name, initial, and a code). This means that if an individual is an expert in six disciplines, there are six records on file for him. Obviously, such a file structure makes producing reports a real chore.

Greiner thinks that what he needs is a relational database system (and maybe a hard disk). He has examined *Keystroke* but feels that the inability to call up a second file except during creation mode limits its applicability to his situation.

There are a variety of ways Greiner might restructure his file to accommodate his needs. Any B.U.G.s who have gone through a similar experience with Apple III files? If so, please be in touch to share your expertise.

Macthoughts. As anyone who's used a Mac for a while already knows, using the mouse as a major input device is very easy, and having a computer act like one's desk is very convenient. We'll be taking a close look at the Mac from a business user's standpoint after it's been out awhile and more business software is available for it.

Speaking of business software, a lot of vendors are developing applications for this machine. *PFS:File*, *PFS:Report*, *DB Master*, *dBase II*, *Incredible Jack*, and *Multiplan* are among the programs you can expect to see.

While the Mac is still new, there are some opportunities for some unique contributions. We'll name a couple here and suggest others in future columns.

How about a guidebook that details for the business user the roles that the IIe, the Macintosh, and the Lisa can play in the work environment? Such a publication might delineate the strengths and weaknesses of each system in the business setting and identify the various software available.

There may come a time when an Apple IIe owner also acquires a Macintosh or a Lisa. Since both Mac and Lisa will be using 3 1/2-inch disks, transferring files between an Apple and either of these machines will be a problem. The first person to come up with a neat way to transfer Apple IIe data to a Macintosh (perhaps via a communications program?) will have a nice product for a while.

That's all for this month. Thanks for tagging along. ◨

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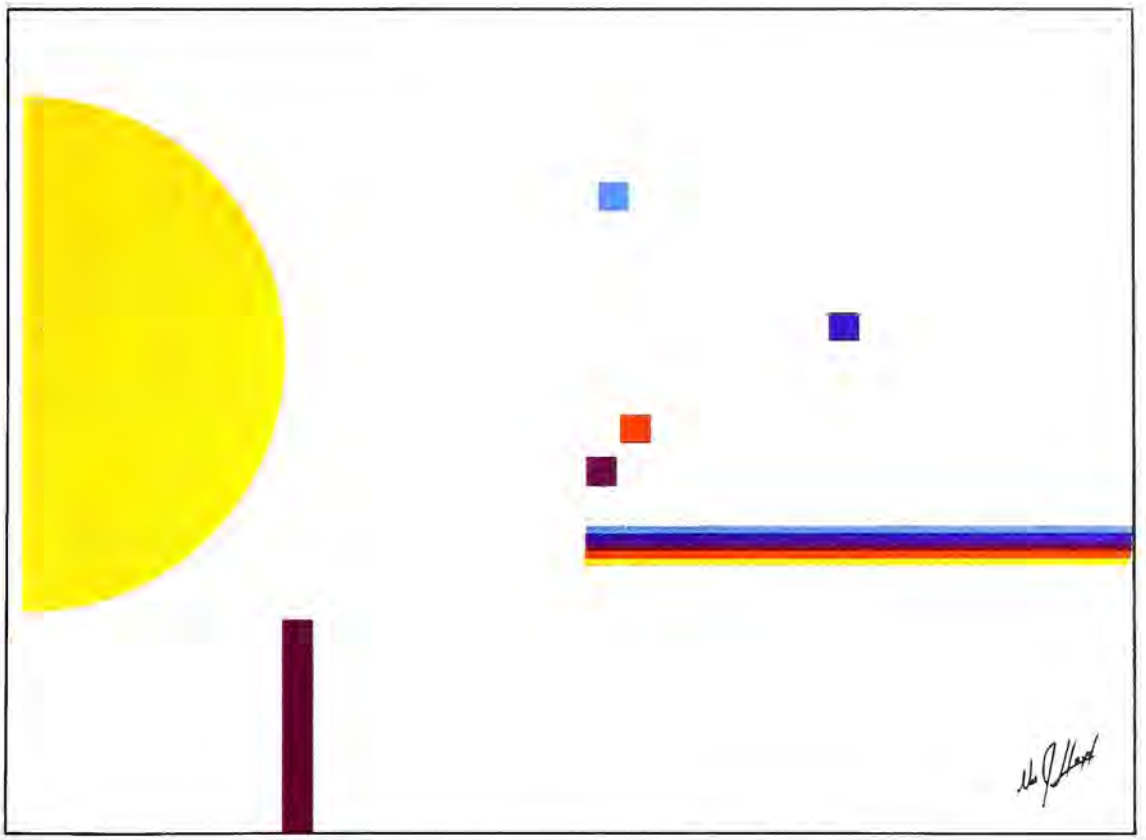
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Conferences Where Nobody Cares What You Look Like

So far in this column we've resisted every temptation to do what most other computer publications have done and make references to George Orwell's *1984*. And we'll continue to resist. With that point made, let's get down to business.

Computers are making changes in the way we do things, that much is certain. The way we write documents, handle business accounting, play games, teach our children, and store information is all made (sometimes) easier by computers. But where these machines have a far greater effect is in the way we communicate with each other. Think for a moment. Of all the people you correspond with on BBSs and other networks, how many of them have you ever met in person? Chances are that there are a lot of people you know from BBSs but whom you haven't met.

(Last February, a group of ten programmers who'd communicated on a San Diego board for more than a year met for the first time. They went parachute jumping together. Most of them mentioned that nobody looked anything like what they had imagined.)

Computers are a medium. Like telephones, they offer the possibility of communication. Unlike normal telephone hookups, computers offer group communication—computer conferencing. Before we get into that, here's a bit of semiboring background information about how computer conferencing started.

Remember Sharing? Let's say we have this big mainframe computer at *Picks of Flicks* (a publication that reviews films). Most of the time it's used by the research department as a giant database system to hold information on actors, directors, films, and gaffers in the industry. Because of limited funds, there's only one terminal to be shared by everyone in the department, and the terminal is in the computer room.

One day, Victory in Indonesia Productions (VIP) releases *Return of the Son of the Thing That Escaped from a Planet in Outer Space*. Before reviewing the film, critic Spud Warner wants to find out some information on the film's star, Karl Borisov. Spud goes to the terminal and does a search for an actor named Borisov. It comes as little surprise that Borisov is nowhere to be found in VIP's database, since this is only his second film. So, Spud enters the following message:

Hey gang, anybody ever heard of an actor called Karl Borisov? I gotta review that new VIP film, but I'd like a little bio on him first. Thanks, —Spud

He saves the message under the name *Help Me* and goes back to his office. Later, one of Spud's co-workers comes to the terminal and reads the file. What luck; she knows a little about Borisov, so she enters a message for Spud:

Spud, I think I can help. I saw Borisov play the lead in an off-Broadway production of The Guy with a Broken Buick *last year. He wasn't too bad, but the play closed after three showings (dress rehearsal and two matinees). I still have the program from it if you'd like to see it. He was also an extra in a movie about sunflowers recently, but I can't remember the title. Hope that helps.* —Lisa

Later still, someone else comes along, reads Spud's plea for help and Lisa's reply, and adds his own assistance:

Spud, believe it or not, I saw the movie Lisa referred to. It was called This Ain't a Movie about Sunflowers*; Borisov played the elixir salesman. Great film.* —Biff

And on, and on.

So far, the system is being used just like a wall where people scribble graffiti or a bulletin board for posting messages; everyone goes to the same place to read and write.

But It Can't Play *Lode Runner*. Later, *Picks of Flicks* purchases a few more terminals and puts them at each reviewer's desk. Instead of trotting off to the computer room to read or leave messages, the reviewers can take care of business without leaving their offices. Remember, though, it's not like having a microcomputer at their desks. They just have terminals; all the retrieving and storing of messages still takes place at the central mainframe.

Soon, *Picks of Flicks* realizes it has a wealth of information in its computer (the database and the message system). As a public service, it decides to make its computer available to anyone who calls in. Calls come in from everywhere—New York, San Francisco, Paris, Beirut, Cape Town.

It's getting too crowded. Hundreds of calls a day. At first, callers are leaving messages related to films, but soon they begin branching off to other subjects—film making, cameras, science fiction, comic books, cartoons, children's television, demise of the education system, child psychology, abnormal psychology, mutant biotechnology, and so on. Spud and his coworkers are having to sift through all the messages to find information pertinent to their work.

At this point, *Picks* has two options. It can continue letting outside people use the system and put up with the message traffic, or it can cut them out. Neither option is what *Picks* wants, so it looks for a third solution.

Here's what *Picks* wants: Outside people should be able to have access to information in the database, and they should be able to add messages to the bulletin area. But only a relative few (reviewers and outside writers) should be able to read and put film-related messages into the system. The solution is simple: passwords.

Because Spud started this whole mess, he's in charge of deciding who gets to join the film group. To those people, he issues passwords to the film area of the message system. Now the computer does more than just store and retrieve files; it acts as a security guard that maintains a list of people's passwords and who has access to what.

It's Like Cloning Yourself. *Picks*'s current setup represents a simple model of conferencing: The door to the topic of films is open to a select group of people, while all others do their

communicating outside. Computer conferencing usually isn't limited to one conference per system; it's more likely that several conferences go on at once, with participants taking part in more than one conference at a time.

Computer conferencing is extremely helpful in private use (in-house and field personnel) by corporations. It offers a way for people to exchange information and ideas without having to get together physically. Teleconferencing (telephone or video) does the same thing, except it still requires everyone to be available at the same time.

Not all conferencing systems are private, as we saw in the *Picks of Flicks* example. Two conferencing systems available to people with personal computers are Electronic Information Exchange System (EIES) and Participate, which we mentioned briefly last month.

EIES is accessible for a fee through the Telenet and Uninet packet-switching networks, and Participate is free to The Source subscribers. Because Participate is available to more people for a lot less, we'll use it as a model of computer conferencing.

(Just in case EIES fans are feeling a bit steamed at that last statement, let us say that we're *not* saying Participate is necessarily better than EIES, it's just more accessible to more people. EIES and Participate are similar enough for the purposes of our discussion.)

Go to the Head of the Table. Anyone can start a conference. A group of people can agree to start one or an individual can start one. Conferences can be open to the public or they can be kept private.

Starting a conference involves giving it a name and writing a brief (usually two hundred words or fewer) description of what you want to discuss. It's also helpful to state in which direction you'd like the conference to go (though it may well take off in an entirely different direction) and what kinds of people would be interested in joining. Here are descriptions, as they appear on The Source, of some popular conferences on Participate:

"Megatrends" Conference 84.10 John Naisbitt, organizer, about "What is the nature of the changes that are transforming American society?" (answers: 100)

"Nuclear Balance" Conference 83.13927 Congressman Markey, organizer, about "The US-USSR nuclear balance of weapons and terror" (answers: 90)

"Systems" Conference 82.245 MIT/CISR, organizer, about "Management information, executives on-line, office automation, decision support & telecommunications systems (answers: 103)

"Jokes" Conference 82.1503 Mike, organizer, about "Join here . . . just for laughs . . ." (answers: 237)

"Word Fog" Conference 82.5295 Connatic, organizer, about "The relationship between thought and language" (answers: 176)

"Politics" Conference 83.7860 Ken at PSI, organizer, about "A forum for political discussion" (answers: 663)

The name of the conference appears between quote marks, followed by a conference number (conferences can be referred to by name or number). Next is the name of the conference originator, which can be a person or an organization. After that are a few words (sometimes a thesis) describing the conference, followed by the number of answers, or comments, that people have added to the conference.

Suppose Spud wants to start a conference about Karl Borisov. Here's his description:

"Actor Karl Borisov" Conference 82.1101 Spud Warner, organizer, about "Is this guy a menace to the film industry or what?" (answers: 15)

A conference directory lists all the current conferences so anyone perusing the system can note the names or numbers of conferences they're interested in joining.

What Is Life? Conferences center on topics as broad as "Computers," or as focused as "The revision B Apple IIe with eighty columns and 256K—what it means to Ohio schools." It's up to the originator to decide. Broad or narrow topics will likely branch off to subtopics, so don't be put off if a conference looks either too general or too specific. Most of the time, topics fall somewhere in the middle, being broad enough to attract as many as forty or so members and narrow enough so browsers can tell at a glance whether or not they're interested.

Conferences grow like trees; they begin as main trunks and later sprout branches as participants decide to divert from the main topic to related ones. For example, in Spud's conference about Karl Borisov, everyone takes turns adding information about the actor—good and bad films he's been in, his role in the Screen Actors' Guild, strife he's had with major directors, and the like. Messages like these that are added to the main conference are called *answers*; they are answers to the conference description that was posted by the originator.

After a while, someone decides to delve deeper into the subject of Borisov's history of bad films:

Why is it that Borisov has a habit of appearing in so many bad films? Are the films he appears in just plain bad, or is it Borisov who makes them bad? I'd be interested in hearing others' opinions.

When a person appends the message to the conference, he'll post it not as an answer, but as a new conference. It will show up as an answer when other participants read through the main conference, but the system will indicate that it's also the beginning of a subconference, which they can choose to follow or ignore.

Branching can continue virtually forever, but because not everyone follows a subconference that branches from a bigger one, the number of participants for subconferences gets smaller each time a branch sprouts another branch. Like a tree, younger generations of branches are usually smaller than the older ones.

Can We Go Home Now? Computer conferences, like their real-life counterparts, have lifespans. That is, after the subject has been exhausted, or after the problem to be solved has been solved, the conference ends. This would be the case if a conferencing system like Participate were implemented for in-house use by a corporation for the purpose of solving a particular problem. On public systems like The Source, conferences tend to go on indefinitely. New people are continually joining while others leave or participate less often.

Now that we have an idea what conferencing is about, let's look at some specifics.

Signing on to Participate is easy. Members of The Source simply type *parti* at the command level, and the rest of the way is prompted by menus. The first order of business is identification. Participants can sign on using a "handle" by which they identify themselves on Participate, or they can use their real names. Passwords are optional in case several persons use the same Source account.

Also, participants can enter their addresses and short descriptions of themselves, their interests, business (if pertinent), and Source address. Participate files this information under each participant's name, where it's accessible to anyone who wants to find out about fellow participants.

At first, Participate seems like a huge BBS, with paths leading in all sorts of directions. It wouldn't be unusual for a first-time user to feel a bit lost wandering from one conference to another. The idea and architecture of Participate is simple; its size is what seems to overwhelm. As a remedy, Participate includes "Practice." Technically, "Practice" is a conference; however, it's really just a way for newcomers to learn the different commands and the general structure of the system.

In addition, all instructions are available online; a good idea would be to download them and keep a hard copy for quick reference.

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After going through the practice session, the next thing to do is find a conference to join. This part of Participate is like moving down the line at a cafeteria; you look to see what's available, checking to see which dishes are popular and which ones people are staying away from.

To see the bill of fare, type *profile conferences* at the "Action" prompt. This gives you a list of the organized (formal) conferences that are currently taking place. Formal conferences have moderators who make sure the conference doesn't wander too far from the subject. A list of formal conferences looks like the short list provided earlier in this column.

Coat, but No Tie Required. There's also a list of all informal conferences on Participate. To list these, just type *profile "Parti" contents* at the "Action" prompt. Parti is the main conference on Participate; it's mainly announcements of new public conferences. All informal conferences branch off of Parti, so this is where to find new ones. Like formal conferences, informal ones can also have subconferences branch off from them; typing *profile "name"* (where "name" is the name of the conference) will list the subconferences that branch from it (example: *profile "Science Fiction"* will list the subconferences of the informal conference, "Science Fiction").

Informal conferences look a lot different from formal ones. A partial list of informal conferences appears in the listing.

To get into a conference, type *read "conference name"* at the "Action" prompt (again, where "conference name" is the name of the conference you want to see). At the end of the conference message, a "Disposition" prompt is displayed. This is where you decide to join or go to another conference. In a real-life conference, it would be like poking your head in the door, finding out what the conference is about, and deciding whether or not to join in.

If you decide to join the conference (by typing *join* at the "Disposition" prompt), Participate will alert you to any new notices or messages from that conference each time you enter the system from The Source. As with most conferences, there's the possibility you'll eventually gather all the information you need or become so bored with the conference that you'll want to leave. Etiquette for real-life conferences almost prevents people from getting up abruptly and walking out the door, but with Participate it's easy; no one sees you leave, and no one thinks you're rude. Leaving a conference is as simple as typing *leave* at the "Disposition" prompt. No more messages from that conference will appear in the "in" box when you enter Participate.

We're Still Human. It's important to keep in mind that computer conferencing isn't a computer system as much as it is a people system. It's a network of people who normally wouldn't have met each other. (An exception would be if the system were set up in-house for a corporation to use. Even then, the fact that they set up a conferencing system indicates that the users have difficulty meeting.)

Computer conferencing's main objectives are to solve the problems created by differences in time and distance between conference participants. A less obvious problem it helps to solve is one of self-censorship. Because computing is usually done in isolation, we communicate on computers in vastly different ways from the way we talk in person or on the telephone.

Face-to-face conversations give us visual information (the person's physical appearance, facial expressions, eye contact, hand gestures); in telephone conversation, we hear inflections and tone of a person's voice, length of pauses, and volume. In written communication, which includes computer conferencing, we have none of these clues and are limited strictly to the information (words) presented. Someone who has difficulty talking in front of audiences may be able to express opinions more honestly and coherently in a written form.

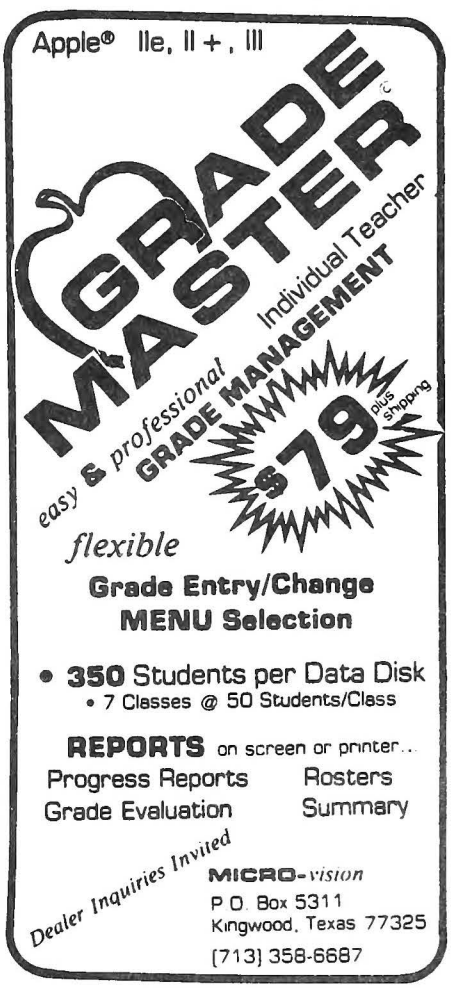
Another barrier computer conferencing breaks is that of hierarchy. A typical Participate conference on The Source might include business executives, students, computer hobbyists, homebodies, professors, doctors, lawyers, journalists, or just curious "passersby." Except during jury duty, rarely in life would such a diverse group be able to get together and exchange ideas; and even if they did, some group members would dominate the discussion, cutting out the more timid or less dominant ones. Computer conferencing allows all participants to let their voices be heard; because the information is written, it's harder to interrupt, ignore, or tune out—an impolite practice in in-person situations.

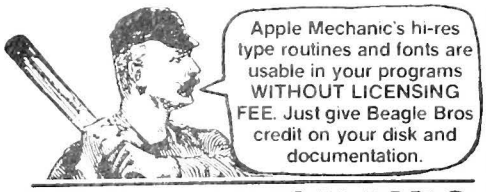
Daily Fix. Participate is undoubtedly one of the most popular features of The Source. Of course, the only way to get an actual feel of computer conferencing is to try it. Be warned, though, that conferencing is incredibly addicting. Sometimes a discussion will get rolling so well that you'll be tempted to sign on every day to see new developments. Other times you might post a message or start a conference so stimulating or thought-provoking that you'll want to sign on twice a day to see how others are reacting (positively or negatively) to it.

Describing conferencing as addicting isn't an exaggeration. It's not unusual to feel a sort of withdrawal if, for some reason, you can't sign on at your regular time. Take heart; it's not like missing a favorite television show; all messages will still be there next time you sign on.

73	"JOKES", 82.1503	(245)
89	"ARTS/HUMANITIES", 82.1723	(35)
110	"DREAMS", 82.1960	(45)
126	"SCIENCE FICTION", 82.2303	(135)
185	"SLAVERY TODAY", 82.3223	(42)
202	"UNIX", 82.3517	(242)
221	"TELENET", 82.3839	(35)
235	"CP/M USERS GROUP", 82.4045	(48)
266	"NUCLEAR ARMS RACE", 82.4418	(54)
301	"WORD FOG", 82.5295	(176)
391	"SMALL BUSINESS", 83.187	(62)
406	"TELECONSULTANTS", 83.452	(211)
439	"SPACE SHUTTLE", 83.1186	(73)
474	"GAY RIGHTS", 83.1746	(642)
497	"COMPUTERS & LAWYERS", 83.2427	(24)
526	"POEMS", 83.3022	(33)
539	"COMPAQ PORTABLE", 83.3381	(23)
544	"THE END OF HUNGER", 83.3404	(40)
569	"GAMES", 83.4218	(86)
579	"PHILOSOPHY", 83.4511	(180)
607	"ALZHEIMER'S DISEASE", 83.5582	(24)
626	"AIDS INFO NETWORK", 83.6125	(55)
650	"STC CENSORS BBS", 83.6567	(33)
657	"PHYSICS (II)", 83.6661	(46)
670	"SMALL GODS", 83.7064	(84)
680	"MISSILE DEFENSE", 83.7255	(216)
695	"NEW MUSIC", 83.7654	(43)
703	"POLITICS", 83.7860	(692)
720	"KOREAN AIRCRAFT - ?", 83.8249	(171)
732	"COMPUTER KIDS", 83.8640	(125)
737	"NEW DEMOCRACY", 83.8731	(149)
756	"CDC PLATO", 83.9253	(38)
758	"NY MEN", 83.9306	(127)
794	"APPLE STOCK", 83.10083	(36)
799	"MCI MAIL", 83.10125	(54)
817	"HALLOWEEN", 83.10665	(75)
851	"COMPUTER TEACHER", 83.11999	(51)
853	"APPLE TIPS", 83.12207	(26)
859	"ADVENTURE CLUES", 83.12986	(22)
862	"THE DAY AFTER", 83.13105	(168)
1039	"CES", 84.372	(85)
1055	"COMPUTERS", 84.588	(35)
1059	"WRITERS", 84.701	(39)
1080	"UNIVERSITIES", 84.1130	(29)
1101	"MACINTOSH NOW", 84.1594	(95)
1162	"SOFTCON", 84.3604	(31)
1166	"ACADEMY AWARDS", 84.3705	(5)
1170	"VALENTINE BOX", 84.3765	(38)
1179	"NO GUNS", 84.3835	(10)
1213	"WOMEN'S ISSUES", 84.4973	(83)

Listing of informal conferences.





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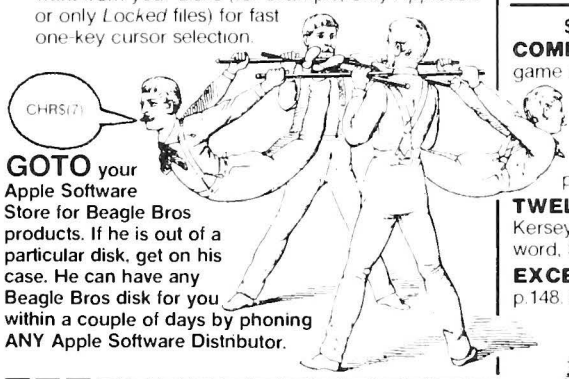
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   (176)*256+36 TO 3072: POKE ZZ,216: NEXT
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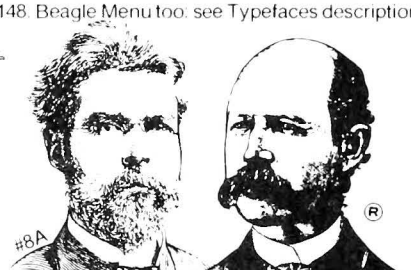
$29.50 Includes Peeks & Pokes Chart

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.



Beagle Bros Micro Software Inc.

4315 SIERRA VISTA / SAN DIEGO, CA 92103
619-296-6400

ALL BEAGLE DISKS ARE UNLOCKED, COPYABLE AND COMPATIBLE WITH APPLE II, II+ AND IIe.* (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!

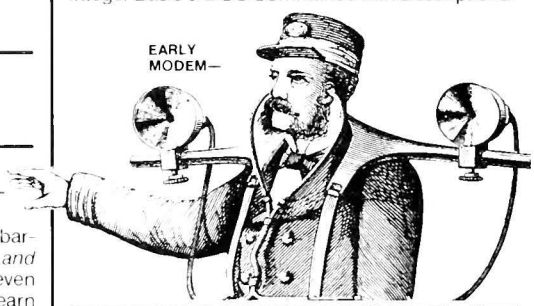
TIP DISK #1

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 2 -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.



Beagle Bros Micro Software Inc.

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(Don't Settle for Less!)

* DISKQUIK requires Apple IIe.
"APPLE" is a Registered Trade Mark of You-Know-Who.

BEAGLE BASIC

APPLESOFT ENHANCER
by MARK SIMONSEN

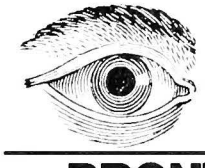
$34.95: Includes Peeks/Pokes Chart & Tip Book #6
Requires Apple IIe (OR II/II+ with RAM Card).

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
☐ DOS Boss	24.00	☐	
☐ Double-Take	34.95	☐ ADD ME to mailing list	
☐ Flex Type	29.50	☐ ALREADY ON mail list	

AT YOUR APPLE DEALER NOW!
Or order directly from Beagle Bros—



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Orders only / ALL 50 STATES / 24 Hours a Day

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Add $1.50 First Class Shipping. Any-Size Order.
Overseas add $4.00. COD add $3.00. California add 6%.
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Apple II

CP/M

IBM PC

SPECTRUM

Professional Software Products

MATHEMATICS SERIES

The Series Includes These 4 Programs:

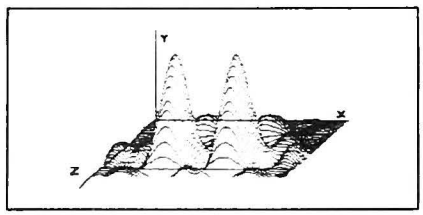
STATISTICAL ANALYSIS I: This menu driven program performs LINEAR REGRESSION analysis, determines the mean, standard deviation and plots the frequency distribution of user-supplied data sets.

NUMERICAL ANALYSIS: HI-RES 2-Dimensional plot of any function. Automatic scaling. At your option, the program will plot the function, plot the INTEGRAL, plot the DERIVATIVE, determine the ROOTS, MAXIMA, MINIMA and INTEGRAL VALUE.

MATRIX: A general purpose, menu driven program for determining the INVERSE and DETERMINANT of any matrix, as well as the SOLUTION to any set of SIMULTANEOUS LINEAR EQUATIONS.

3-D SURFACE PLOTTER: Explore the ELEGANCE and BEAUTY of MATHEMATICS by creating HI-RES PLOTS of 3-dimensional surfaces from any 3-variable equations. Hidden line or transparent plotting.

For APPLE II (48K) and IBM PC (64K) $50.00



BUSINESS SOFTWARE SERIES

Both Programs $250.00

A user-friendly yet comprehensive double-entry accounting system employing screen-oriented data input forms, extensive error-trapping, data validation and special routines for high speed operation. The series includes these two modules:

GENERAL LEDGER: A complete accounting system with these features:

- Up to 500 accounts and 500 transactions per month.
- Interactive on-screen transaction journal.
- Produces these reports:
  - Transactions Journal
  - Account Ledgers
  - Income Statement
  - Balance Sheet
  - Account Listings

For APPLE II and IBM PC $150.00

ACCOUNTS RECEIVABLE

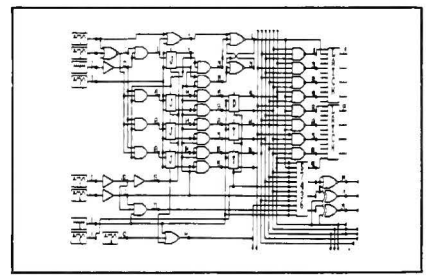
A flexible system with these features

- Up to 500 accounts and up to 500 invoices per diskette.
- Prints invoices, customer statements & address labels.
- Interfaces to General Ledger.
- Interactive screen-based invoice work sheet.
- Produces these reports
  - Aged Receivables
  - Sales Analysis
  - Account Listings
  - Customer Balances

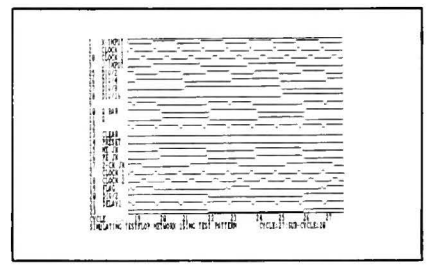
For APPLE II and IBM PC .... (2 DRIVES) ... $150.00

MICRO-LOGIC

An interactive graphics program for designing and simulating digital logic systems. Using the built-in graphics module, the user creates a logic diagram consisting of AND, OR, NAND, NOR, EX-OR, D, T, JK FLIP FLOP and powerful 16 pin user-defined MACRO functions. A typical page of a logic diagram looks like this:



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.

For APPLE II, IBM PC (192K) and CP/M (70K) $450.00
MANUAL & DEMO DISKETTE $50.00

PERSONAL FINANCE MASTER

The premier personal and small business financial system. Covering all types of accounts including check registers, savings, money market, loan, credit card and other asset or liability accounts, the system has these features:

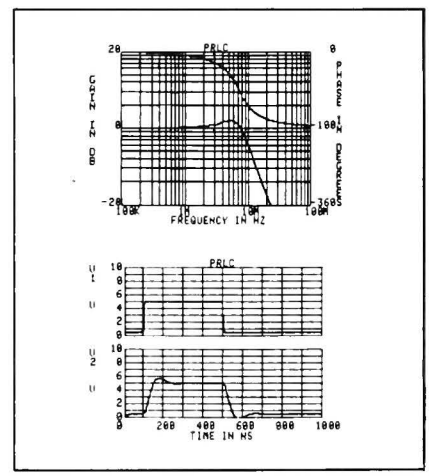
- Handles 25 Asset/Liability Accounts
- Monthly Transaction Reports
- Budgets Income & Expense
- Reconciles to Bank Statements
- Prints Checks & Mailing Labels
- Automatic Year-End Rollover
- Prepares a Net Worth Reports
- Searches for Transactions
- Handles Split Transactions
- User-Friendly Data Entry Forms
- Fast Machine Language Routines
- Extensive Error Trapping
- HI-RES Expense/Income Plots

For APPLE II and IBM PC $75.00

MICRO-CAP

Microcomputer Circuit Analysis Program

Tired of trial & error circuit design? Analyze and debug your designs before you build them. With MICRO-CAP you simply sketch your circuit diagram on the CRT screen and run an AC, DC or TRANSIENT ANALYSIS. Your circuit may consist of RESISTORS, CAPACITORS, INDUCTORS, DIODES, BATTERIES, BIPOLAR or MOS TRANSISTORS, OPAMPS TRANSFORMERS, and SINSUSOIDAL or USER-DEFINED TIME DEPENDENT VOLTAGE SOURCES. MICRO-CAP can analyze any such network containing up to 40 separate nodes. Includes a user controlled MACRO library for modelling complex components such as OPAMPS and Transistors.



For APPLE II and IBM PC computers. A non-graphics version using an on-screen editor to enter networks and text printer plots to display simulation results is available for CP/M (2.2- 5 1/4" SSSD) systems. Requires 2 disk drives.

For APPLE II, IBM PC (192K) and CP/M (70K) $475.00
MANUAL and DEMO DISKETTE $50.00

ORDERING INSTRUCTIONS: All programs are supplied on disk and run on Apple II (64K) or IBM PC (128K) with a single disk drive unless otherwise noted. Detailed instructions included. Orders are shipped within 5 days. Card users include card number. Add $2.50 postage and handling with each order. California residents add 6 1/2% sales tax. Foreign orders add $5.00 postage and handling per product.

SPECTRUM SOFTWARE

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(408) 738-4387
DEALER INQUIRIES INVITED.

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.

☐ The ultimate end-user show, the 1984 National Computer Conference (NCC) will be held July 9–12 at the Las Vegas Convention Center. The four-day conference program has been designed to address the interests of several groups of attendees. The ten program tracks include: hardware and architecture; computer communications; the automated office; information processing management; database management; artificial intelligence; graphics and entertainment; educational and societal issues; personal computers; and software engineering. Other highlights of NCC will be the keynote address by John F. Akers, president of IBM; a series of professional development seminars; a film forum; and the usual mammoth exhibition of computer wares. NCC is sponsored by **AFIBS** (1899 Preston White Drive, Reston, VA 22091; 703-620-8926). Registration fees vary, depending on how much of NCC you attend. $45–$75.

☐ The *ProDOS User's Kit* has been released by **Apple Computer** (20525 Mariani Avenue, Cupertino, CA 95014; 408-996-1010). ProDOS enables Apple II computers to use Apple's ProFile hard disk and offers increased compatibility between the Apple II and Apple III. ProDOS has a hierarchical file structure that provides an organized method for managing larger numbers of files on larger storage devices, as well as a utility for converting DOS 3.3 data files to work with ProDOS-based application programs. $40.

☐ **Howard W. Sams** (4300 West Sixty-second Street, Indianapolis, IN 46268; 317-298-5400) has introduced a number of new products. *BASIC Tricks for the Apple* includes more than thirty-five subroutines that provide shortcuts for programming. $8.95. *CP/M Bible* is a reference guide to CP/M and its associated languages and utilities. The reference handbook discusses more than fifty CP/M-related topics. $19.95. *Regatta* is a game designed to help users sharpen their sailing skills. For one or two players, *Regatta* includes a manual that describes strategies and explains nautical terms. $29.95. *The CompuThink Guide to Word Processing* offers assistance to choosing the most appropriate word processing system and the software to run on it. $12.95. *SuperCalc Primer* gives readers information on creating and formatting worksheets, as well as defining formulas, entering data, and more. $16.95.

☐ *The Data Converter* package has been released by **Holland Automation USA** (3400-D West MacArthur Boulevard, Santa Ana, CA 92704; 714-641-2844). The software package is designed to change application data to DIF and ASCII formats. Requires CP/M. $145.

☐ **EduSoft** (Box 2560, Berkeley, CA 94702; 800-EDUSOFT or 415-548-2304) has announced its 1984 catalog. The catalog offers educational software for Apples and other computers. Free of charge.

☐ *Insights into Microcomputer Publications*, a book providing information for best advertising results through discussion of marketing strategy, tips for design, and copywriting, has been published by **June Whitworth and Associates** (3107 Cole Avenue, Dallas, TX 75204; 214-698-0322). $35.

☐ **Software Specialties** (Box 329, Springboro, OH 45066, 513-748-0471) offers *Status*, a program for the Apple that covers a variety of statistical operations using data files. *Status* computes general means and moments, test statistics, and performs one- and two-way analysis of variance and analysis of covariance. $295.

☐ Several microcomputer programs designed to help psychologists and educators evaluate the needs of exceptional children have been published by **Southern Micro Systems for Educators** (Box 2097, Burlington, NC 27216; 919-226-7610). *P.E.A.R.* (PIAT Error Analysis Report) provides the user with diagnostic and instructional planning information based on test results. $395. *Unistar II Pre-IEP Report* can be used for elementary through high school students and generates goals and objectives for the individual student. This is an expanded version of *Unistar I*. $695. *Unisum* is a data management software program to be used with *Unistar I* or *Unistar II*. $195. *Distinctive Feature Analysis* (DFA) is a system used for analyzing articulation patterns and providing efficient treatment for clients of speech/language pathologists. $395. *W.E.A.R.* (Woodcock Reading Mastery Tests Error Analysis Report) provides a comprehensive error analysis of a student's performance on the Woodcock Reading Mastery Tests. $2.95. *WAIS-R Computer Report* does routine calculations and comparisons of scaled scores. $495. *Stanford-Binet Computer Report* generates a comprehensive psychological report based on a student's performance on the S-B Scale. $295.

☐ The Liberal Arts Building of Triton College in Oak Park, Illiniois, has been designated as the meeting place for **A.E.S.O.P.** (Apple Enthusiast Society of Oak Park, Box 4111, Oak Park, IL 60303). The monthly meetings will be held through June the first Sunday of each month in room 202-203 at 7 p.m. For further information, contact Patt Chase.

☐ **Transwestern** (1711 Senter Road, San Jose, CA 95112; 408-279-2544) has released an uninterruptible power supply for personal computers called the Ultraguard series. The unit, which is an ac-powered, battery backup power source, is designed to be used with small computer systems and instruments that must remain operational during ac power blackouts. $649.

☐ An advanced touch-typing software instruction program, *Typing Tutor III*, can be obtained from **Simon and Schuster** (1230 Avenue of the Americas, New York, NY 10020; 212-245-6400). $49.95.

☐ **Amdek** (2201 Lively Boulevard, Elk Grove Village, IL 60007; 312-364-1180) has introduced a new RGB card called DVM-III. The card, which fits in slot 7 of the computer, reproduces on RGB monitors the video modes the computer is capable of displaying on NTSC or composite monitors. $195.

☐ A stress-reducing hardware/software package called *Relax* is being offered by **Synapse** (5221 Central Avenue, Richmond, VA 94804; 415-527-7751). *Relax* uses biosensory technology to monitor human stress levels by representing muscle tension graphically on the computer monitor. A special headband with tension-measuring EMG sensors and an audiotape of stress-reduction exercises comes with the software. $149.95.

☐ **Designs III Publishers** (515 West Commonwealth, Fullerton, CA 92632; 714-871-9100) has published *The Whole Computer Catalog*. The reference book describes opportunities in the computer industry, as well as answering questions that computer users frequently ask. $35.

☐ *Micro Goodies* introduced by **Irv Brechner** (Micro Goodies, Catalog Request Department, CN5283, Princeton, NJ 08540; 201-731-4382) is a computer novelties catalog featuring humorous as well as useful computer items. Free of charge.

☐ *The AAMI Journal* is a bimonthly publication featuring articles on investment analysis with the microcomputer. The journal is published by **American Association of Microcomputer Investors** (Box 1384, Princeton, NJ 08542; 609-921-6494). $3.

☐ **Heyden** (247 South Forty-First Street, Philadelphia, PA 19104; 215-382-6673) has announced four software products. *Microfile* is a search and catalog package. $75. *Datalogger* is a standalone data logger, memory recorder, and on-line data acquisition system. It has applications ranging from aerospace to medicine and the environment, and comes with an RS-232 interface. $1,345–$3,600. *Audiovideogration* is software designed to create reproducible chromatography integration. The integration can use a program-defined baseline, peak start, and peak finish, as well as slope sensitivity. $385. *Macro Utilities Master* (MUM) is a disk of selected utility routines to help with Applesoft programming. With a set of macros, the user can renumber, shorten, and merge pro-

PRO-MODEM 1200



It's about time.

Time for your computer to make the telephone connection – with an intelligent, full 212A 300/1200 baud modem – with a real time clock/calendar – and with the capability to expand into a complete telecommunications system. It's time for PRO-MODEM 1200. Much more than just a phone modem.

When you're on-line, time is money. PRO-MODEM telecommunication systems help you save. By monitoring the duration and cost of your phone calls. And by sending and receiving messages, unattended, at preset times when the rates are lower. . .with or without your computer.

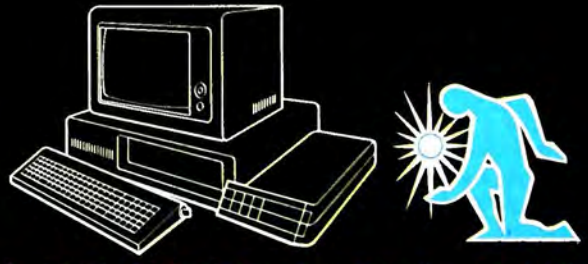
Compare the $495 PRO-MODEM 1200 with any other modem on the market. For example, you'd have to buy both the Hayes Smartmodem 1200 plus their Chronograph for about $950 to get a modem with time base.

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grams, search for variables or strings, and more. $24.50.

☐ In process since November 1, 1983, the Verbatim Computer EdGame Challenge, sponsored by **Verbatim** (4966 El Camino Real, Suite 228, Los Altos, CA 94022; 415-966-1412), will continue through April 30. The educational programming contest gives school children in kindergarten through high school an opportunity to win a personal computer, a disk drive, and a monitor. There is no entry fee.

☐ Several software packages have been announced by **Dynacomp** (1427 Monroe Avenue, Rochester, NY 14618; 716-442-8960). *Appletest* is an Apple diagnostics disk that identifies troubles and apparent problems with your Apple. $19.95. *Advanced Disk Editor* provides manipulation of disk data on a byte-by-byte level. $39.95. *Tidy* is a program that processes Fortran source programs. $39.95–$42.45. *Alphacat* organizes the directories on your disk alphabetically. $14.95. *Operations Research Tutorial* is a collection of seventeen programs that provide functions such as data file creation and calculation capabilities. $99.95. *The Adam Osborne Software Collection* consists of five programs that touch on finances, basic math, statistics, and more. $9.95 per individual program or $39.95 for the five-program set. *Digital Image Processing* allows you to digitally manipulate images to remove interference and noise, improve contrast, and sharpen and filter images. $59.95. Designed to test the ability to define, explain, compute, and identify on the basis of familiarity with definitions, theorems, and postulates, *Geometry Review* is intended for use by high school geometry students. $19.95. *Applesoft Tutorial* is an educational disk of menu-driven lessons on how to use Applesoft Basic. $9.95. Included in *Domino* is a twenty-eight-page manual that describes the original game, explains strategies, and tells users how Dynacomp's version is played. $29.95. *Might and Magic* is a fantasy role-playing game wherein the player creates a character, sends the construct on a quest, and seeks to increase the character's wealth and power. $39.95. *Off-the-Wall* is an arcade game, the objective of which is to slowly chip away the ceiling with a bouncing ball. $14.95.

☐ **Micro-Sparc** (Box 325, Lincoln, MA 01773; 617-259-9710) has an updated version of *Lexicom*. *Lexicom 3.0* is a file-transfer utility that converts files of one type to another. $49.95.

☐ *Introduction to the Elements*, an interactive educational software package, teaches students about the elements and the Periodic Table. The courseware is from **Applied MicroSystems** (Box 832, Roswell, GA 30077; 404-475-0832). $29.95.

☐ **MicroMotion** (12077 Wilshire Boulevard, Suite 506, Los Angeles, CA 90025; 213-821-4340) has published *Forth Tools*, a comprehensive introduction to Forth-83. The book focuses on the Create-Does> construct, which is used to extend the language through new classes of data structures. $20.

☐ *Disk Fix* introduced by **The Software Store** (706 Chippewa Square, Marquette, MI 49855; 906-228-7622) reconstructs files with bad sectors, recovers files from disks with damaged directories, and restores erased files. $150.

☐ *Compucard* is being offered by **Rolodex** (245 Secaucus Road, Secaucus, NJ 07094; 201-348-3939). *Compucard* is a computerized filing system that updates, edits, and stores card files. $49.95, software and manual only; $68.50, Rolodex Filer and continuous form cards included.

☐ **World Almanac** (200 Park Avenue, New York, NY 10166; 212-557-9652) has published *Moonlighting with Your Personal Computer*. The guide was written for computer owners interested in freelancing in the fields of consulting, writing, software packaging, contract programming, setting up system houses, and becoming contract bureau specialists. $7.95.

☐ Offering a new course called "The Personal Computer Industry Tutorial: Opportunities and Pitfalls" is **Future Computing** (900 Canyon Creek Center, Richardson, TX 75080; 214-783-9375). The two-day sessions cover the development of the computer industry, the leading players and their strategies, and distribution channels. Call for times and locations. $895.

☐ A mobile computer workstation for personal computers called Compucart has been released by **Electronic Systems Technology** (1023 North Kellogg Street, Kennewick, WA 99336; 509-735-8444). $209.95.

☐ **Ballantine Books** (201 East Fiftieth Street, New York, NY 10022; 212-572-2392) has announced three recently published books. *Apple IIe User's Handbook* is a guide to operating the Apple IIe. $9.95. *The Giant*

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Book of Computer Games features tips on how to create your own games. $7.95. *Computers for Writers* is a book for professional writers, or anyone who does a lot of writing, and is interested in word processing. $6.95.

☐ **Continental Software** (11223 South Hindry Avenue, Los Angeles, CA 90045; 213-417-8031) has announced *Property Management*—a real estate program. The package performs bookkeeping functions for residential or commercial property. $495.

☐ A book of trivia and arcane facts about computers, *The Naked Computer*, is published by **William Morrow** (105 Madison Avenue, New York, NY 10016; 212-889-3050). $15.95.

☐ **Artsci** (5547 Satsuma Avenue, North Hollywood, CA 91601; 818-985-2922) has announced *Magic Office System*. The integrated software system combines the functions of word processing, an electronic spreadsheet, and a spelling checker in a file folder and file cabinet display. $295.

☐ *Hello Computer: An Introduction to Basic* is a book for beginners who want to program in Basic and is published by **Reston Publishing** (11480 Sunset Hills Road, Reston, VA 22090; 703-437-8900). $12.95.

☐ **Sweet Gum** (15490 N.W. Seventh Avenue, Miami, FL 33169; 800-237-9338 or 305-687-9338) is offering the Magic Input/Output mug as a gift item. When hot liquid is poured into the mug, one message disappears and another appears on a computer monitor depicted on the cup. The three versions available feature the messages: "Programmer On/Off Duty," "Computer Nut On/Off Duty," "Computer Expert On/Off Duty." $8.95.

☐ The Voice Input Module by **MCE** (157 South Kalamazoo Mall, Suite 250, Kalamazoo, MI 49007; 800-421-4157) permits individuals to run software, as well as to program, by voice alone. $845–$1,025.

☐ **Lexisoft** (Box 1378, Davis, CA 95617; 916-758-3630) has announced the release of version 5.30 of its *Spellbinder* word processing system. Updated features include a spelling and grammar checker, automatic hyphenation, footnoting, augmented forms, and a revised manual. $495.

☐ *The Antonym Game* and *The Vocabulary Game* are designed to help students improve their vocabulary and prepare for the SAT and similar examinations. The player has the option of selecting easy, difficult, or very difficult words. Both games are offered by **J and S Software** (140 Reid Avenue, Port Washington, NY 11050; 516-944-9304). $29.50 each.

☐ **ADM Concepts** (1445 Los Angeles, Suite 301, Simi Valley, CA 93065; 805-581-1202) has introduced a data system security link called Commlock. The system is designed to be compatible with all standard asynchronous data communication. $600.

☐ *The Software Catalog: Science and Engineering*, published by **Elsevier Science Publishing** (52 Vanderbilt Avenue, New York, NY 10017; 212-867-9040), contains descriptions of programs of interest to engineering research departments in business and universities. Data used in compiling the book was derived from the International Database. $29.

☐ *The Farm Accountant* program is a double-entry general ledger created specifically for farmers. The program is available through **Digipac** (907 River Street East, Prince Albert, Saskatchewan, Canada S6V OB3; 306-764-1707). $195.

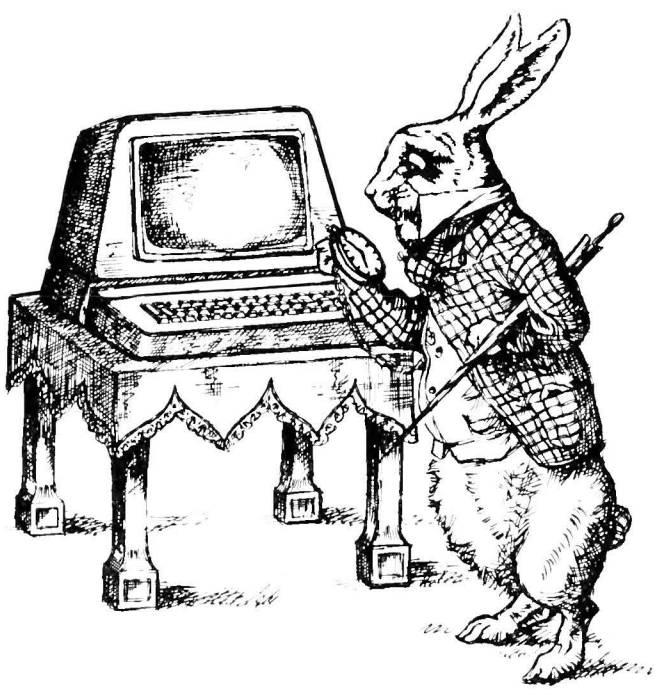
☐ **William Kaufmann** (95 First Street, Los Altos, CA 94022; 415-948-5810) has published *Sing a Song of Software: Verses and Images for the Computer-Literate*. The book contains verse about computers, software, and programming. $8.95.

☐ Containing more than 1,000 words and sentences, *Vocabulary Machine* was designed to expand reading skills in grades one through twelve. The program is published by **SouthWest EdPsych Services** (Box 1870, Phoenix, AZ 85001; 602-253-6528). $59.95.

☐ The object of *The Heist*, a strategy/arcade game, is to remove every piece of artwork from a museum and find the hidden micro dot containing information vital to the safety of the world. *The Heist* is new from **Micro Lab** (333 North Michigan Avenue, Chicago, IL 60601; 312-346-7886). $40.

☐ *Speed File*, announced by **Bluebush** (3379 Saint Mary's Place, Santa Clara, CA 95051; 408-244-1631), is a free-form data entry and retrieval

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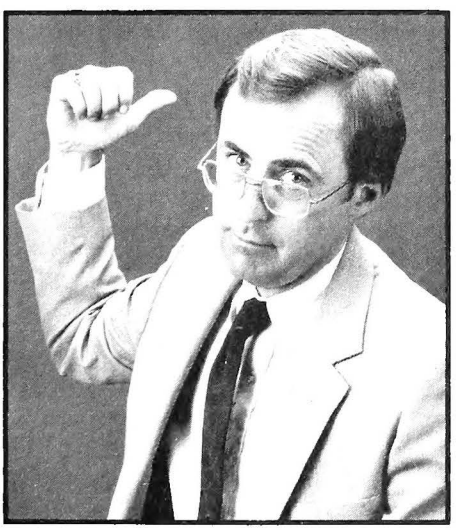
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software-filing program. The package requires no special entry format or access codes. $125.

☐ **Stoneware** (50 Belvedere Street, San Rafael, CA 94901; 415-454-6500) offers the *DB Master File Converter*. The converter allows *PFS:File* and *VisiFile* users to transfer existing data into greater capacity files. $350.

☐ **Beck-Tech** (41 Tunnel Road, Berkeley, CA 94705; 415-548-4054) has a product that allows you to use your computer to do advanced program development and circuit emulation with Beck-Tech's Mice utilities. The hardware/software package is called Mice-Apple. The interface card is also useful for trace debugging. $250.

☐ **The Source of Microcomputer Market Research** (Box 610, Schoharie, NY 12157; 518-295-7881) has published *The Stinson Report*. The newsletter focuses on home and business computer buying trends. The report projects how much hardware, software, and peripherals will be purchased in the next six months. $295.

☐ *Spending Less and Enjoying It More* is a book/software package by **Culverin** (Box 503, Dayton, OH 45459; 800-547-1565 or 513-435-2335). The package offers a budget-planning system that demonstrates step by step how to set up a viable budget. $49.95.

☐ **Wadsworth Professional Software** (Statler Office Building, 20 Park Plaza, Boston, MA 02116; 800-322-2208 or 617-423-0420) has announced its Lisa 2 version of *Statpro: The Statistics and Graphics Database Workstation*. The package is a series of integrated statistics, graphics, and data management programs designed to make the Lisa 2 a research and management workstation. $1,995.

☐ In addition to traditional spreadsheet functions, *PractiCalc* features alpha and numeric sorting, alpha and numeric search, prompts for entry during calculation, and printing of list formulas. *PractiCalc* is offered by **Micro Software International** (The Silk Mill, 44 Oak Street, Newton Upper Falls, MA 02164; 617-965-9870). $69.95.

☐ **State of the Art** (3183-A Airway Avenue, Costa Mesa, CA 92626; 714-850-0111) has a self-pacing study guide called *Guide to Computerized Accounting*. It gives an introduction to basic accounting and examines how a computerized accounting system works. $6.95.

☐ *HGR6*, announced by **Alf** (1315-F Nelson Street, Denver, CO 80215; 303-234-0871), is a double-hi-res graphics package for Apple IIe. The package saves double-hi-res images on disk, either in standard form or compressed. $49.95.

☐ **Quark** (2525 West Evans, Suite 220, Denver, CO 80219; 800-543-7711) has introduced *Catalyst IIe*, a hard disk program selector that switches between even copy-protected programs. $149.

☐ *Exact Dimensions* is a dimensions printing calculator that works in feet, inches, fractions, decimal inches, and meters. **Aspen Inchware** (Box 3203, Aspen, CO 81612; 303-925-3734) is the creator of the software product. Introductory price effective to May 1, $48.50. Thereafter, $79.95.

☐ **Decillionix** (Box 70985, Sunnyvale, CA 94086; 408-732-7758) has announced two products, *DX-1 Volumes 2–5* and *DX-1 Echo*. Both products are complementary to *DX-1*, a product for recording, processing, and playing back ordinary sound. $239. *DX-1 Echo* includes routines for real-time audio processing, echoing, and reverb. $149. *DX-1 Volumes 2-5* comes complete with four disks. $79.

☐ Several games from the Arcademic Builders series are being offered by **Developmental Learning Materials** (Box 4000, Allen, TX 75002; 800-527-4747 or 800-442-4711). *Arcademic Skill Builders in Language Arts* contains six individual games that provide practice and drill in language arts areas. $44. *Arcademic Skill Builders in Math* features a combination of microcomputer software and print materials for practicing math. $44.

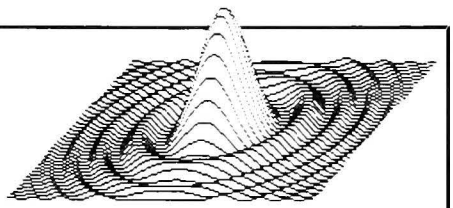
☐ A hardware/software laboratory workstation designed for the Apple II family of computers, *Appligration II*, is available from **Dynamic Solutions** (61 South Lake Avenue, Suite 305, Pasadena, CA 91101; 213-577-2643). *Appligration II* uses Dynamic's *Appli-Pac* software packages. $1,995.

☐ **Darryl L. Sink** (1155 North First Street, San Jose, CA 95112; 408-297-3900) has released *New Horizons: The Educator's Computer Literacy Series*. The educational courseware was designed to help educators introduce computers into the classroom. $1,500.

☐ **TaxCalc Software** (4210 West Vickery, Fort Worth, TX 76107;

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Color fill portions of picture	X	—	—
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View picture before printing	X	—	X
Print any portion of picture	X	—	X
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817-738-3122) has added new calculation capabilities to its *TaxCalc Tax-Planning* software program. *Tax-Planning* now works in conjunction with *Perfect Calc*, *Ultra Calc*, and *Micro Plan*. $150.

☐ A computer furniture catalog called *The Pervel Collection* is published by **Interior Design Systems** (3641 Saint Mary's Place N.W., Washington, DC 20007; 202-333-7502). The catalog contains information about ergonomic furniture designs and accessories. Free of charge.

☐ **Advanced Data Institute of America** (1215 Howe Avenue, Sacramento, CA 95825; 916-925-0009) is offering a database management system called *Aladin*. Integratable with other programs, the software also incorporates calculation, statistics, and graphics capabilities. $595.

☐ Financial forecasting capabilities are featured in *MoneyMaker* from **Money Tree Software** (760 S.W. Madison Avenue, Corvalis, OR 97333; 503-757-1114). $139.

☐ **Voice Machine Communications** (1000 South Grand Avenue, Santa Ana, CA 92705; 714-541-0454) is shipping IntroVoice II, a speech input device. IntroVoice II works with any existing Apple II series application software, including word processing, electronic spreadsheets, games, and graphics. $920.

☐ A courseware package entitled *Business Assortment* has been produced by **Educational Computing Network** (Box 8236, Riverside, CA 92515; 714-687-3333). The product is a collection of financial programs, tutorials, simulations, and spreadsheet templates. $75.

☐ *Diascriptive Reading I* is a program that diagnoses student reading skills and prescribes what is needed for improvement. It is available from **Educational Activities** (Box 392, Freeport, NY 11520; 516-223-4666). $245–$295.

☐ *Compiler Construction* has been published by **The University of Colorado** (College of Engineering and Applied Science, Engineering Editor's Office; 303-492-5071). A graduate-level textbook and reference work, the book defines the relationship between languages and machines, enabling the computer user to program more effectively. $24.95.

☐ **Smith Micro Software** (Box 604, Sunset Beach, CA 90742; 213-592-1032) has announced the release of the *2nd Edition Plus* of its *Stock Portfolio System*. The updated version of the system is designed to run faster and cut down on the complications of usage. $185.

☐ *Taxdoc* is a home, personal, and small business accounting and record keeping package released by **Advanced Micro Systems** (26188 Adamor Road, Calabasas, CA 91302; 818-880-4670). The program includes a seventy-eight-page manual. $69.95.

☐ *First Encounters* is a multimedia kit developed to teach computer literacy in schools through the use of card games, keyboard charts, worksheets, and a lesson board. **Educational Activities** (1937 Grand Avenue, Baldwin, NY 11510; 516-223-4666) is offering the product. $98.

☐ Computer and Electronics Swap Meet is being held by **Micro International** (Box 774, Highland Park, IL 60035; 312-945-4372). The event is scheduled for 10 a.m. to 5 p.m. on April 15 at the American Legion Hall in Elmhurst, Illinois. Admission is $3.

☐ **Inmac** (2465 Augustine Drive, Santa Clara, CA 95051; 408-727-1970) has introduced a line of floppy disks called Encore. The disks come in single-sided/single-density, single-sided/double-density, and double-sided/double-density formats. $1.59–$2.99. The company is also publishing the *Personal Computer Support Catalog*, which contains more than two thousand supplies and accessories available for personal computers. Free of charge.

☐ *Musicland*, a set of musical games designed to teach musically untrained children form, timbre, orchestration, composition, and transposition was recently unveiled by **Syntauri** (4962 El Camino Real, Suite 112, Los Altos, CA 94022; 415-966-1273). The four basic games contained in the software package are Sound Factory, Timbre Painting, Music Doodles, and Music Blocks. $150.

☐ **Entrepreneur Magazine** (2311 Pontius Avenue, Los Angeles, CA 90064; 213-478-0437) has a series of financial forecasting programs entitled *Entrepreneur Software Series*. The programs consist of startup manuals, software disks, and an analysis of how to construct a business plan. $200.

☐ A courtroom setting has been incorporated in **Navic Software**'s (Box 14727, North Palm Beach, FL 33408; 305-627-4132) new strategy game *Jury Trial II*. The computer acts as a judge controlling the proceedings, ruling on objections, admitting evidence, and occasionally citing a witness for contempt of court. $49.

☐ Several new books for computer users have been published by **Hayden** (10 Mulholland Drive, Hasbrouck Heights, NJ 07604; 201-393-6306). *Getting the Most From Your Micro* is a guide to the care and maintenance of microcomputers. $14.95. *Basic Computer Programs in Science and Engineering* is a book packaged with two disks containing 114 Basic programs for the hobbyist and engineer. $34.95. Twenty-eight business programs written in Apple Pascal are contained in *Pascal Programs for Business*. Two disks are included with the book. $49.95. *Basic Computer Programs for the Home* contains eighty-one Basic programs that can be used in the home. $34.95.

☐ A take-off of the Enchanter series, *Sorcerer* challenges the player to save the kingdom and locate the mentor despite treacherous obstacles. *Sorcerer* is a new fantasy game from **Infocom** (55 Wheeler Street, Cambridge, MA 02138; 617-492-1031). $49.95.

☐ Products such as medical and dental billing packages, general ledgers, and word processors are included in *B-84*, a business applications catalog published by **Monument** (Box 603, Joshua Tree, CA 92252; 619-365-6668). Free of charge.

☐ **BPI Systems** (3423 Guadalupe, Austin, TX 78705; 512-454-2801) is now shipping *General Accounting*, *Accounts Receivable*, *Accounts Payable*, and *Payroll* accounting software packages for the Lisa 2. The software uses the Lisa's mouse for menu and item selection. $595 each.

☐ *Apple II/IIe Computer Graphics* from **Prentice-Hall** (Englewood Cliffs, NJ 07632; 201-592-2158) gives details on creating computer graphics. The package includes a disk. $39.95. Other books published by Prentice-Hall include *Programming the Apple II in Basic*, which is a step-by-step handbook and disk that illuminates Basic programming techniques and methods. $19.95. *Animation, Games, and Sound for the Apple II* is a book and disk package that provides information on creating arcade games using the Apple II. $29.95. *Apple II-6502 Assembly Language Tutor* is a book/software tutorial for assembly language programming. $34.95. *Pascal for the Apple* features information on Pascal as a first computer language. $33. *The Apple House* explains in detail how the Apple can be used to control devices in your home. $22.95. *Your Apple II Needs You: 30 Programming Projects for the Apple II* includes thirty programming projects, such as arcade games. $16.95. ■

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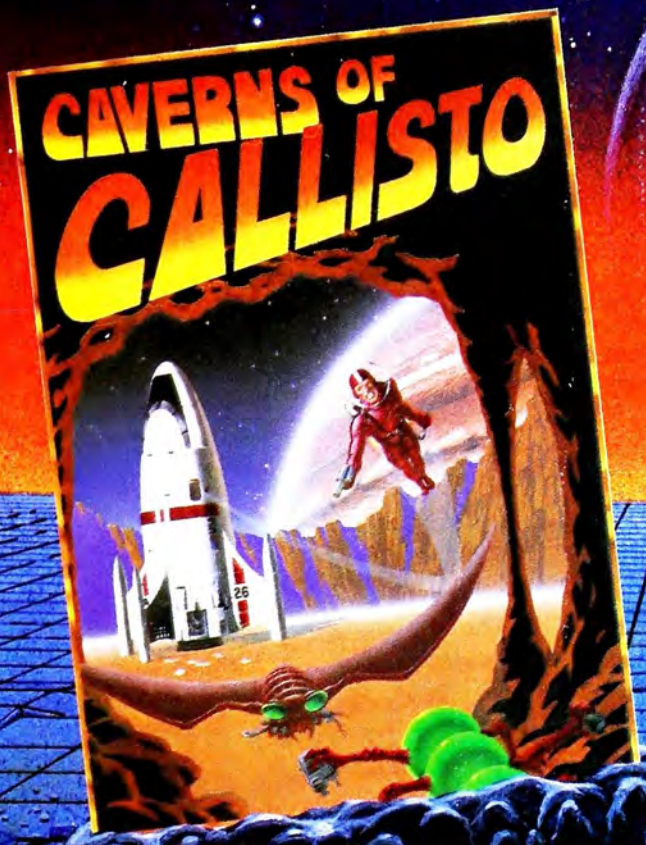
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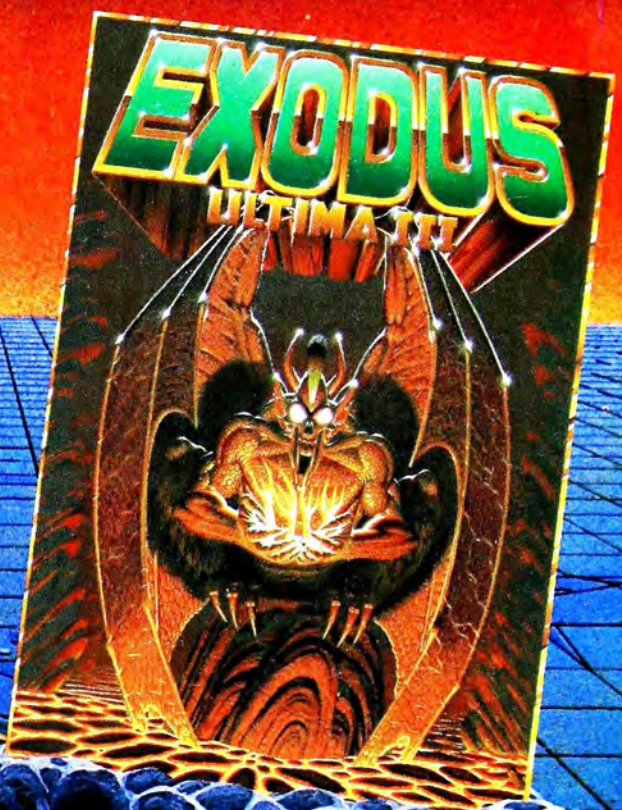
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BY MICHAEL FERRIS

A very pregnant Celia Willis lies in birthing room number 7, experiencing her own special pain. She's temporarily lost the ticket. Fidgeting and gasping, she's not concentrating on the business of labor. The attending nurse recognizes the signals—the expectant mother's mind is on "the pain she won't remember" and not her impending motherhood.

"Bear down," says the nurse, coaching Willis to focus on working with the contractions again. "That's it. Good." Soon she rejoins the home team and gets back into rhythm with the coming event.

She's almost ready to push. The nurse hollers for some backup as she adjusts the straps across Willis's ripeness. The straps connect to an electronic fetal monitor at the bedside; a big, boxy unit beating like a washing machine, the monitor graphs the heartbeat of the unborn child.

Down the hall, the signal is being watched at the nursing station by a visiting doctor, several nurses, and an Apple.

The lines representing Willis's contractions and the baby's heart rate are displayed on a monitor. In a span of thirty seconds, or half an inch on the pixeled graph, the baby's heart rate drops abruptly, from 120 to 100 beats per minute.

"This is interesting," says the doctor, watching the graph line dive, then go flat. "I wonder how the Apple will call it."

A small square at the lower right of the screen displays the word "bradycardia," warning of the sudden drop. Then the phrase "poor signal" is displayed.

There is a flurry of green and yellow scrub gowns outside room 7. "She's crowning," says a nurse in passing, indicating that the head of Willis's baby can be seen. "The presentation looks good."

That's one time a baby's heart rate can drop, explains the observing obstetrician, indicating that the computer's bradycardia warning was valid. The poor signal analysis indicated that the nurse had disconnected the monitor straps from the mother. Right again.

Her doctor is scrubbing for the delivery. The business end of the oak bed in room 7 is removed. Stirrups and hand grips go up. Willis is about to introduce her five-pound, eight-ounce teammate to the world.

Mama Told Me You Better Shop Around. The O.B. depart-





Give Your Baby an Apple— Before Birth



Every day is the first day of a newborn baby's life at Sinai Hospital in Detroit. There're still plenty of "genius" doctors and residents on staff, even though mothers do more now than they used to—while an Apple assists

ment at Sinai Hospital in Detroit is licensed as a level-three facility by the state department of public health. This means it is equipped with a neonatal intensive-care ward for handling the babies born in high-risk situations. Although most mothers come to the hospital from the greater Detroit area, some come as far as 100 miles to have their babies delivered at Sinai. The level-three designation gives Sinai the edge in dealing with problem pregnancies. A specially trained high-risk unit is on staff, schooled in handling difficult deliveries and Caesareans.

The Apple II Plus fetal monitoring system in Sinai's Perinatal Center is the work of Dr. Edward Lichten, coordinator of medical computer applications at Sinai. Already an obstetrician-gynecologist, the doctor could now add programmer to his title if he wanted to. Not really a hacker, he calls himself more of a "plodder." That hasn't stopped him from doing some amazing things with microcomputers at the hospital—it's just taken him longer.

"Every year fifty thousand babies are born with severe mental impairment such as cerebral palsy," says Lichten. "An equal number are stillborn. A significant percentage of these tragedies are avoidable," if a doctor can get to a baby in time. Getting to a baby in time these days means getting to it in utero, or in the uterus.

Some of the personal complications that can put a woman into the 15- to 20-percent high-risk category are as follows.

High blood pressure (called toxemia).

A history of spontaneous miscarriages.

An older mother. The delivery of a child by an older woman, meaning any woman over age thirty-five, increases the risk of congenital birth defects.

Diabetes, before or during pregnancy. Since a mother supplies her baby with essential blood sugar nutrients, the bouncing up and down of a baby's food supply could mean trouble for the child.

A preexisting cardiac condition. Carrying the weight of an unborn child puts an added strain on a mother's heart. Her blood volume increases, taxing the organ that pumps nutrients to the child and carries away waste products.

The chance of fetal hemorrhaging. In some women, the afterbirth will plant itself low, over the mouth of the womb, instead of



Special classes in birthing methods, technology, and better prenatal care are helping create a new awareness of the child-bearing process.





higher up. The placenta can get detached in labor, causing internal blood loss. Whereas an adult can lose a cup of blood and not miss it, an unborn child has only a small amount to start with.

I Heard It through the Grapevine. In an atmosphere of thirty-five hundred deliveries a year at Sinai, fetal monitoring by way of microcomputer is a boon to doctors following their patients' progress during labor, warning of pattern changes indicating possible abnormal fetal conditions. In the last fifty years, maternal and fetal death rates have dropped due to such advances. "The advent of electronic fetal monitoring has radically transformed the practice of obstetrics," says Lichten, "significantly increasing the information available to a doctor."

A bedside fetal monitor—there are several different brands—is typically a big metal unit on wheels. A monitor spits out a tape showing a baby's baseline heart rate and the frequency of a mother's contractions in black ink on graph tape.

Electronic fetal monitors hit the market in the early sixties. They work by either taking an ultrasounding of the womb "like a fish finder," using a strap, or by picking up electrical impulses through a wire attached to the baby's head and another slipped inside the mother. The "noninvasive" external monitoring picks up the beeping sound of a baby's amplified heartbeat, pumping twice as fast as an adult's. The "invasive" EKG monitoring method produces a slightly different beep.

Before the advent of electronic monitoring, a device called a fetoscope was used by obstetricians. "It was a hand-held mechanical thing similar to a stethoscope," says head nurse Joe Theriault. "The problem with it was that you were only sure of a baby's condition when you were listening. Five seconds later, it could change." A doctor would put the device to a mother's belly and count out a heartbeat for one minute every half hour or so during labor.

Nowadays, with electronic monitors, doctors look for patterns and correlations between a mother's contractions and a baby's heart rate. They read long graph tapes of signals and can differentiate between the ups and downs of the pen scratches. The slowing down or speeding up of a baby's heart is a warning sign. Either sign, coming before or after a mother's contractions, may indicate a problem. That's where a doctor's knowledge of his patient comes into play.

Fetal monitors don't analyze the information, they gather or store it for future use. That's where Lichten's program comes in. Information from the bedside monitors is gathered at a rate of twice per second by the computer. The calculating part of the program looks for patterns, flashing warnings when it finds them. The program searches for four specific conditions: late deceleration of a baby's heartbeat (tachycardia), coming after a mother's contraction; early deceleration (bradycardia), which comes before a contraction; and two kinds of variables.

Isn't She Lovely. Members of the hospital staff take pride in their red-and-glass-brick state-of-the-art Perinatal Center, dedicated just last January. (Peri is Latin for "around the time of.") Designed to encompass care before, during, and after birth, the new wing is one of the many innovative, new-style birthing centers cropping up across the country. The Sinai center features a new brand of obstetric care and a special philosophy.

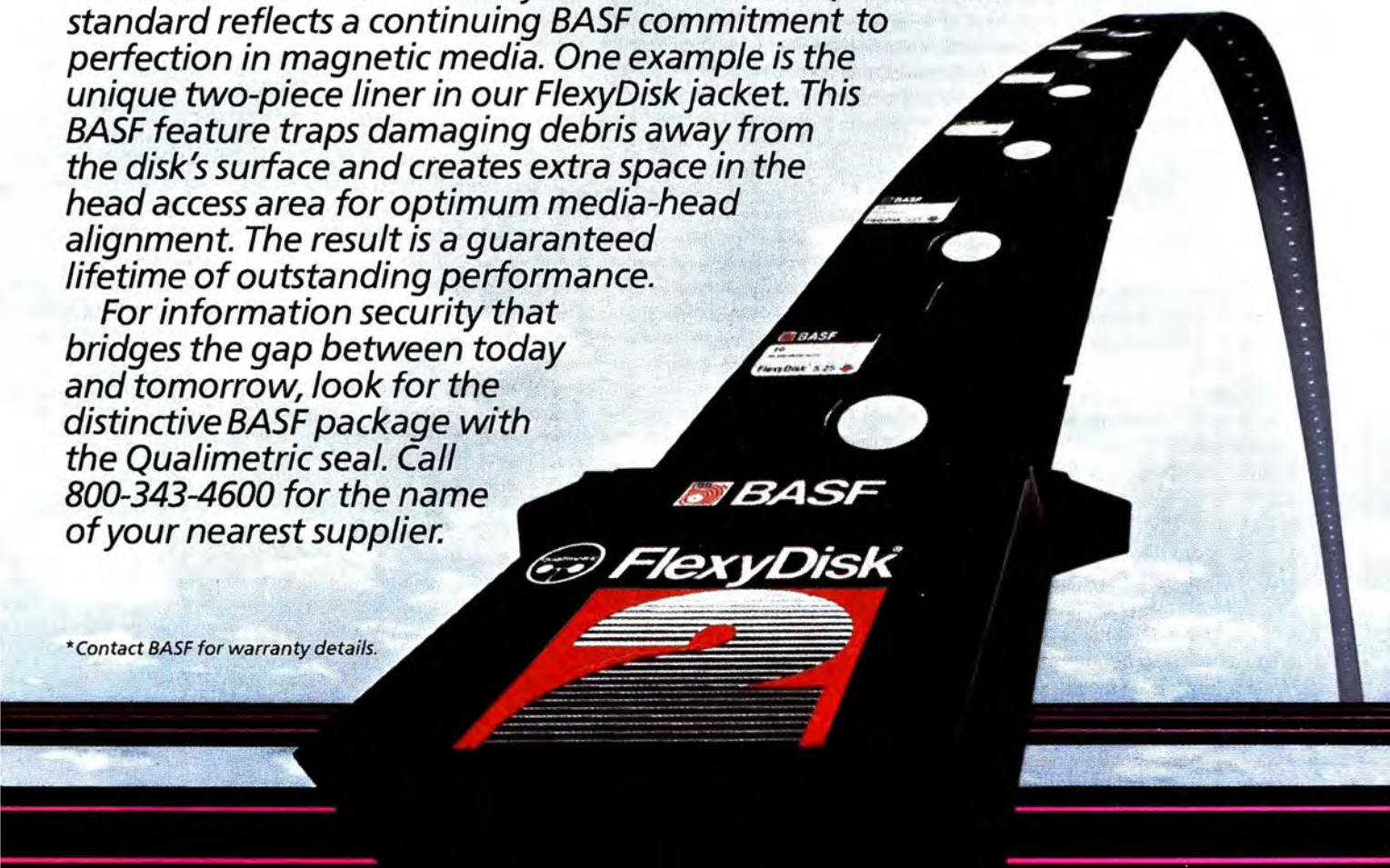
"Our manner of care is different," says Theriault. He's wearing a button that says "Give Your Baby a Chance," part of a campaign for better prenatal care. "Philosophically, we're a family-centered facility. We put a lot of effort into educating pa-

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tients and treating them as part of the whole birthing process. For example, we encourage and train fathers or other family members to coach a mother in birth.'' A husband assisting his wife in delivery wears a disposable jumpsuit and booties that make him ''look like an astronaut.''

''We also provide Lamaze method classes for mothers in their fifth month to teach them the muscle-relaxing and breathing technique,'' he adds.

Other Perinatal Center innovations, gleaned by studying advances in other hospitals' O.B. departments and combining the best features, are equally fresh. ''One nurse, for example,'' says Theriault, ''manages the care of mom and the baby throughout their stay.'' The primary care nurse plans the twenty-four-hour health care of both. The two are considered teammates, and the team is not broken up unless medical complications dictate.

Whenever You're Near I Hear a Symphony. In addition to the standard surgical delivery rooms for high-risk pregnancies, labor and delivery at Sinai features nine ''birthing rooms.'' These are home-style rooms with oak beds, light dimmers, and wall murals, such as a beach scene with waves, a forest with a brook, or a view of Lake Tahoe. The special rooms are designed to combat the tile walls and stainless steel of traditional delivery rooms and also allow for a minimal intervention of technology in the birthing process. If a complication should arise, the mother is only seconds away from a fully equipped delivery room.

The O.B. innovations at Sinai and other hospitals are in stark contrast to the way babies were delivered twenty or thirty years ago. Back then, women were literally drugged, ''buzzed out with general or spinal anesthesia,'' says Theriault, and physicians used forceps to pull, or ''shoehorn,'' a baby out of the womb. Mothers were ''totally in the ozone and didn't participate in giving birth,'' he says. ''The doctor was in complete control.'' Thanks a lot to the women's movement—and a little to technology—women have more control in the situation again.

At Sinai, a newborn child is not shuttled to a nursery immediately after it's born. Mom and infant are left together to communicate. In the 80 percent of pregnancies that go without a hitch, ''the norm is for the baby to room with its mother sixteen hours a day,'' Theriault says. ''Doctors are paid to provide a service. The mom does all the work. She delivers and we assist.''

Above all, the Perinatal Center is intended to be flexible. ''We're here to provide the birthing experience a patient is looking for, as long as it's a safe medical practice,'' says Theriault. His life goal is to become a nurse-midwife, managing routine deliveries himself under the supervision of a doctor, with hospital privileges.

The Hunter Gets Captured by the Game. The Apple sits at the central labor and delivery nursing station, directly opposite a wall board displaying room assignments and patient status, updated with a grease pencil in big, at-a-glance letters. Rooms with monitors currently reading out on the Apple are also noted.

Lifting the lid on the closed Apple would reveal its main program burned into a card full of EPROMs. Some interesting features: The program plots in color on a black-and-white screen, a trick Lichten picked up from a computer magazine. Four patients at a time can be monitored in alternating displays, and an hour of display can be stored in RAM and also sent via modem.

A woman's labor can last anywhere from two minutes to twenty-four hours or more; since it's usually on the longer end, a pattern that causes some worry can be sent off to an expert for analysis if resident doctors don't agree on an interpretation.

At the nursing station phone or just by passing through, staff can keep an eye on the screen and tell if a baby is in distress. ''The Apple acts as an intelligent early-warning system,'' says Theriault, not as a system to tell doctors what to do. It collects data and analyzes it at the same time, and it beeps if there's trouble. ''A person can't be in all thirteen labor rooms at the same time.''

Even so, Theriault is constantly on the move. The Perinatal Center ''has the same feel as a hospital emergency room,'' he says. ''You never know what's going to happen. You're ready for the worst at all times.'' Peeling an eye toward the Apple is now habit with him throughout the bustle of a day.

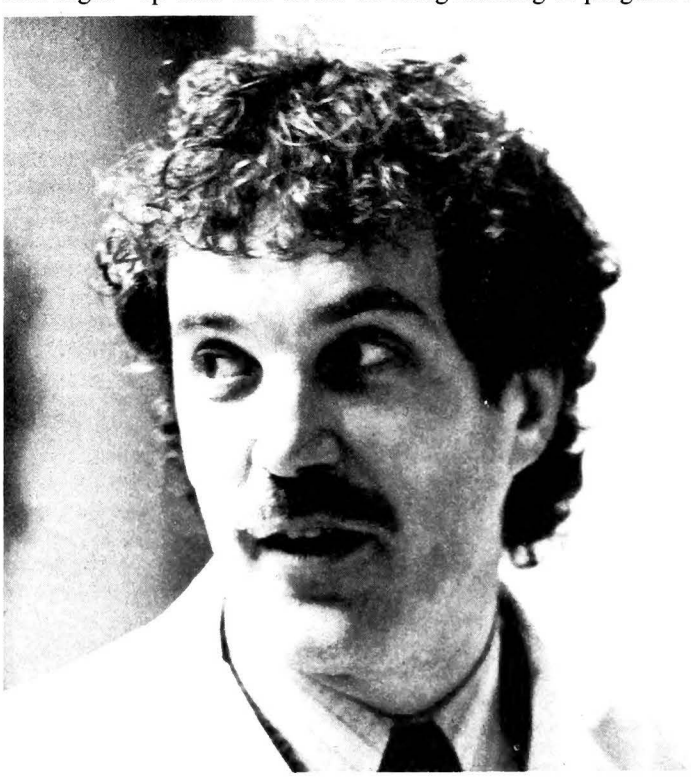
''When we're busy or short-staffed, I can check in on a patient without having to walk down the hallway. Many a time I've glanced up and seen a baby's heartbeat down, and the Apple was my tip-off.''

If it sounds rough on the ward, a baby inside a mother's womb during labor has it even worse. ''Picture a closet with the walls mashing in once every two to three minutes,'' says Theriault. ''It's like someone taking your breath away, and it can be fatal at times,'' unless doctors can get to a baby in time to prevent such things as a placenta prematurely separating, a uterus rupturing, or an umbilical cord getting squeezed between a baby's head and the birth canal.

Yester Me, Yester You, Yesterday. The seed for the Apple monitoring system at Sinai was planted when Lichten was still a student of medicine. ''In 1966 I was a premed with a part-time job stapling invoices at Firestone Tire and Rubber, in Akron, Ohio,'' he says. Blessed with that hearty fundamental known as ''a good math background,'' he was tapped for a promotion. Using a then-new language called Cobol, he became a part-time programmer with the company a year later. ''I had a key to a five-million-dollar complex filled with IBM mainframes.''

He used one of them to design a billing program for the company. ''Of course, when I left, no one knew how I had programmed it,'' he says. As an early do-it-yourselfer, good documentation was his weakness.

Lichten wasn't to meet with computers again until ten years later, after he had gone into full-time medical practice. Introduced to his first microcomputer, the PET 2001, he spent the first night ''up until four in the morning learning to program in



What does the game *Serpentine* have to do with Sinai's fetal monitoring program? Ask Dr. Edward Lichten.

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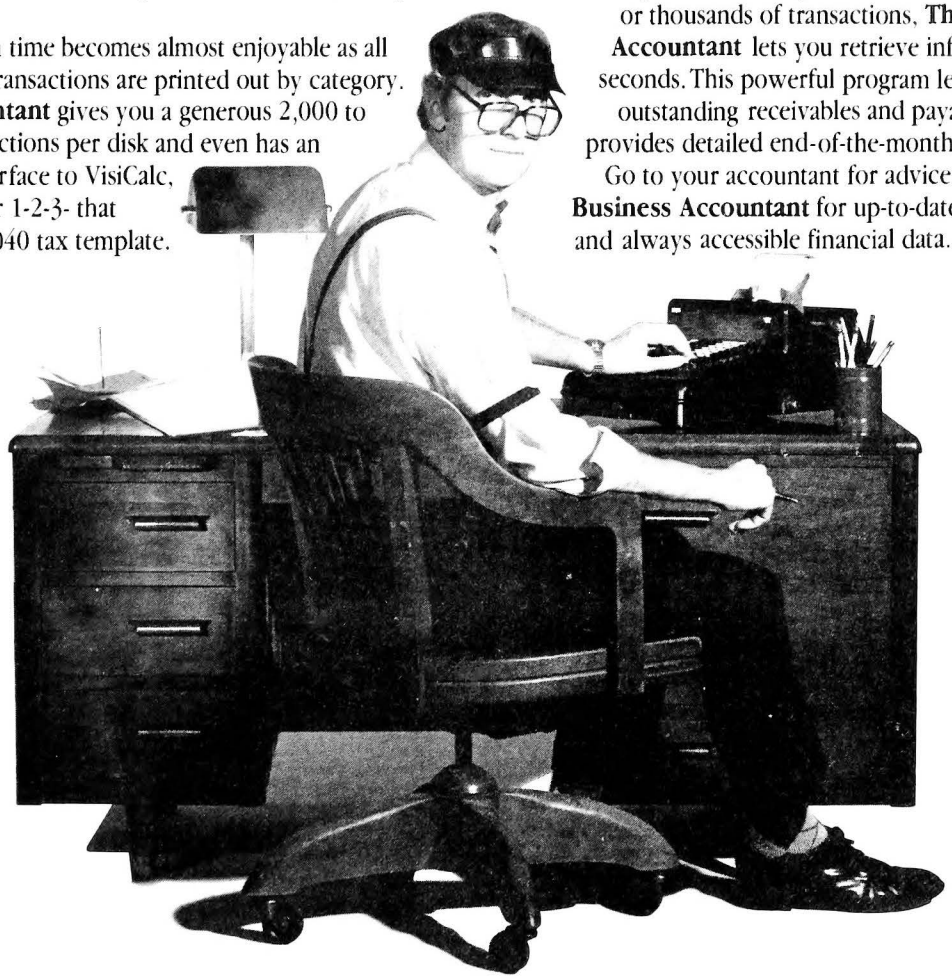
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Basic.''

The inspiration for the monitoring system came from within the hospital itself. In the pale green corridors of the sixteen-bed coronary care unit, hanging monitors display the jagged lines of coronary patient heart rates. Part of a 110K minicomputer monitoring system that interprets electrocardiograms, the screens allow staff on duty to keep a casual eye out for trouble while they make their rounds. A change in a patient's heart action sounds an alarm and flashes a red light in the nurses' station so emergency aid can be sent running.

It's a good, workable system, albeit a tad expensive at one hundred sixty thousand dollars. ''When I saw it, it made me think of what a similar, five-thousand-dollar micro monitoring system could accomplish watching over babies in utero with their whole lives ahead of them,'' says Lichten. ''Until now, no one had considered doing the same for the unborn child.'' That's just what the doctor did.

According to Lichten, the 6502 is capable of fifty thousand math calculations in half a second. His monitor program ''only uses 3 percent of the 6502's potential. I could have added a speech-synthesis board, but the nurses said that if the machine talked they'd throw things at it. That's why it doesn't say 'Emergency in room 3,' or 'Heart rate down in room 2,' which would be no big deal technically. As it is, it only beeps.''

When Lichten first approached Sinai in 1979 with an idea for analog-to-digital measuring of a baby's heart parameters in utero, ''they looked at me like I was nuts,'' he says. One doctor who had been working with DEC mainframe computers for ten years declared what Lichten proposed ''impossible.''

Naturally, Lichten believed otherwise. He was able to get five thousand dollars from department funds to buy and outfit an Apple II. He worked the three hot months of one summer taking signals off the monitoring machines and displaying them on the Apple, stopping and measuring them like an oscilloscope would.

His programming partner those first months was the son of a colleague—a young man named David Snider. When Snider went off to college and, later, to big bucks for creating *David's Midnight Magic* and *Serpentine* for Broderbund Software, Lichten polished the code alone, plugging away in the evenings, two hours a night.

''Wouldn't it be neat,'' he thought, ''if I could get the computer to analyze the oscilloscopelike tracings once they had been done?'' Before leaving, Snider had shown him two programs with forty lines of machine code in them. These were the doctor's tutorial. Two and a half years later he was able to get the patterns displayed the way he needed. Like he said, he's a plodder, not a hacker.

Next he decided to try to get the Apple to do some mathematical evaluations based on the information it gathered from the monitors. ''I didn't tell the hospital that that was what I was going to do or they really would have thought I was crazy,'' he says.

The Love I Saw in You Was Just a Mirage. A computer wasn't supposed to be able to call the shots. ''Medicine is not all voltages and absolute numbers,'' says Lichten. ''It's not a black-and-white thing. It's shades of gray.''

In other words, diagnosis is an art, not a science. The interaction of patterns of a baby's heart rate and patterns for a mother's contractions on the Apple's screen can be read several ways. ''If you show a tracing to a doctor and ask him why he thinks the pattern is an early or late, he may not be able to tell you. He'll just say it looks like it.''

A patient's symptoms set off different thinking in different doctors. ''If medicine keeps pushing for more and more diagnostic testing, physicians will miss the tool they were given—the one between their ears. The point is not the number of tests a doctor runs but how he interprets the information.

''The computer is a science, no question about it, and it can support medicine. But to replace the art of medicine with computer science is something that I don't think will happen.'' The fetal monitor is like any other test. It simply supplies information. It doesn't know how many babies a woman has had previously, or if there have been problems before. It also isn't able to take other risk factors into account, such as a mother's age and health.

The information the Apple gives is precise for its range. A well-trained doctor is like a human expert system. Some of an obstetrician's analytical functions can be computerized, and the parameters in Lichten's program are good examples of this.

''There are mathematical criteria for these phenomena'' such as tachycardia and bradycardia. ''I put them into the machine, and they worked reasonably well.'' The Apple can be considered 85 percent correct when it signals a distress of some kind, according to its analysis of the graphs.

A silent semaphore ''on duty twenty-four hours a day with no coffee breaks,'' the Apple in the labor and delivery room ''isn't there to do its own thing,'' says Lichten. ''It's there to do what a doctor would do in the same situation. In designing the system, I figured out how I, as a doctor, would analyze the signals, then patterned the program after that.''

''Noncomputer people have to use it,'' he says, since it's on the floor and not in a lab, ''and it can't be confusing or the least bit scary.''

Locking Up My Heart and Throwing Away the Key. It often takes a few years for progress to show up in a hospital environment. ''The slowest industry to change is medicine,'' says Lichten. ''It's status quo. Whatever change we produce takes time.'' The fact that patients' life and health are on the line contributes to the cautious nature of administrators. Before something is tried, hospitals like to know it's going to work. Also, one new wrinkle can be fraught with ramifications—staff must be trained and new routines drawn up.

All of which makes Sinai's commitment to microcomputer development all the more unusual. ''I like to think of this hospital as a testing ground for microcomputers,'' says Lichten. It's taken a while to claim that ground, but now the hospital is enthusiastic about its new turf. Since installing the fetal monitoring system, for example, Lichten has gone on to create a nursing station network that runs on the IBM PC, and Apples now help out in several other departments.

''The idea is to put the computers where the people can use them, then let people find ways to use them,'' he says. Which is exactly what's happening at Sinai. The committee that reviews, approves, and funds computer applications, headed by the director of data processing, includes reps from administration, nursing, medicine, and biomedical engineering. It's a new priority with everyone, and every department is involved.

''I can be brilliant, I can write good programs, but if the hospital weren't supporting me, I couldn't do anything,'' says Lichten.

Love Makes Me Do Foolish Things. Hospital support is as important to budding computer development as it is to motherhood. ''Most women will tell you the most significant part of their life is the birthing process,'' says Theriault. ''It's an exciting, emotion-filled process that's hard to forget.''

It's hard for Theriault to be blasé about birthing, even as the head nurse who sees miracles every day. ''You feel more alive doing this kind of work,'' he says. ''It still freaks me out when I see a newborn baby in one of the overhead warmers and think, 'Wow, here's a person who wasn't here ten minutes ago.' ''

To Theriault, ''Every birth is still a miracle.'' ◨

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Roger Wagner on his recent tour of New Guinea

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MARKETALK

Reviews



Unless otherwise noted, all products can be assumed to run on either Apple II, 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 Michael A. Banks, Donald A. Dyer, Cary Hara, Joel Harrod, Michael S. Krupa, Kevin J. Linden, Patricia R. McClelland, Willard Phillips, and Ethan Weiner.

AppleWorks and 3 E-Z Pieces. By Rupert Lissner.

AppleWorks *works on the Apple IIe;* 3 E-Z Pieces *works on the Apple III and takes advantage of its memory. Both were designed by Rupert Lissner for Haba Systems, which publishes* 3 E-Z Pieces*; Apple Computer is publishing* AppleWorks. *Otherwise, the two programs are essentially identical. For easy (or E-Z) reading, the program is referred to only as* AppleWorks *throughout this review except where a comment applies only to* 3 E-Z Pieces.

If *AppleWorks* doesn't do everything *1-2-3* does, you won't care because it does so much more of its own.

AppleWorks is Apple Computer's entry (via Haba Systems) into the integrated program market, and it's a winner. Word processor, database, and spreadsheet cohabit the Apple and each is a full-size, full-featured representative of its genre. Only the database is not totally new: It's *Quick File*, rewritten in assembly language and souped up.

Until you've tried it, it's difficult to imagine how sweet it is to have several programs running at once. Well, the Apple simply is not multitasking, so that isn't what's happening in *AppleWorks* either, but it might as well be. Apparently, and practically, the illusion is complete.

Do you use a spreadsheet—perhaps even one that uses DIF files? Have you several related files that you'd sometimes like to move back and forth among? With *AppleWorks*, simply choose all the files you need (up to a generous memory limit determined by your Apple) to be placed on the "desktop," and you can do just that. *AppleWorks* moves easily and without disk access between the desktop files without ever losing your specific place in any one of them.

The same is true for working with several word processing files or with several database files.

Only when you're moving between files from different applications—word processor and database, for instance, or database and spreadsheet—does *AppleWorks* briefly consult the disk. If you put your *AppleWorks* on a ProFile, disk access is completely unnoticeable.

This has some miniramifications that might help drive home the point: For the first time, it becomes practical to put your phone list on your Apple. So long as your usual occupations at your computer entail

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*Plotting function requires the Hewlett-Packard 7470 plotter and a GraFORTH plotter driver.

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All products operate on Apple II, II Plus, IIe and III.

working with words, numbers, or files, you can interrupt anything you're doing, jump to your phone list for a number, and return to the exact spot where you left off in your other task—without changing disks or running programs or even saving. With Haba's companion program, *Habadex*, it even makes sense to use your computer for keeping your appointment book and schedule, since it can share the desktop.

But these are tiny conveniences (at least they may seem tiny until you've had them a week and consider giving them up). What is more crucial is the quality of the three main programs.

Is this word processor worth giving up your powerful *ScreenWriter* for? Is it easy enough to use that you could graduate to it from your *Bank Street Writer*? Yup. Both. Almost without exception—and here are some exceptions: *AppleWorks* by itself doesn't have the form letter capabilities of *ScreenWriter*; *AppleWorks* doesn't have the always-on-screen menu that young novices, especially, thrive on in *Bank Street Writer*.

On the other hand, you only need to know three keys, which comprise two commands, to get up and running at full speed on *AppleWorks*'s word processor: escape, which toggles to and from the main menu; and Open-Apple ?, which renders a complete rundown of the functions and commands for the entire program.

Of course, if you've already used the spreadsheet or the database, you barely need the word processor help screen. Wherever there are equivalent functions, the same keys work in all three programs.

And, while you wouldn't be wise to tackle five hundred form letters with different addresses, salutations, and in-text references, *AppleWorks* has a unique way of dealing with that letter-with-variations you want to send to your folks, your daughter in college, and your brother in Africa. You prepare the letter without the variables. Don't even leave space for them. But with the cursor at the spot you want each variable, choose the printer option for "Enter Keyboard." When you print the letter, the printer stops at those places and waits for you to type in the custom word or paragraph (and to edit your typos), after which it continues printing, perfectly taking into account whatever you've written, even if you're using justified, proportionally spaced type.

You heard right. Software-controlled proportional letter spacing, if your printer can handle it. Apple's Dot Matrix Printer and Imagewriter permit proportional spacing with as few as six letters per inch (it comes out in larger type) and as many as seventeen letters per inch (that gives you 136 columns on your 80-column printer). You can also choose how many lines to the inch as well as whether your document is single-, double-, or triple-spaced. Except for making sure your paper is in straight, you never have to touch your printer; it's all done in software.

The same options are available for printing out spreadsheet and database files, too.

Can you imagine using a spreadsheet without reading a manual? How about without *opening* a manual? If you know what a spreadsheet is and you're willing to push Open-Apple ? once in a while, you can do it with *AppleWorks*. And the program is spacious, very fast, and complete. There is an option for converting DIF files to *AppleWorks* files; the result, in seconds, is perfectly laid-out spreadsheets ready for you to work on.

The database is *Quick File* and then some, although the machine language translation perhaps entitles it to be called Jet File. Like *Quick File*, it sorts any field in seconds, searches out any configuration of letters no matter where you've hidden them, complies with any horizontal whims you can dream up for screen display and the same or different ones for printing, and saves your report formats with the file. The size of the files is limited by your Apple's memory and, since this database doesn't use virtual memory (does anything but *General Manager*, without going to CP/M?), you can't search through multiple files with one command.

Finally, you can put it all together. Easiest is putting spreadsheet and database material in the word processor. That's the normal flow of things. If, perversely, you want to put a list or table from the word processor into the database or from the database into the spreadsheet, then, assuming the material is at all compatible (a short piece of fiction would not do well in the spreadsheet or database, one would presume), you can do it. Material from any of the three programs can be printed on disk as ASCII text files, and all three can accept ASCII text files as data.

The only catch occurs if you're strictly a DOS user and you'd like to pick up DOS 3.3 text files. *AppleWorks* uses ProDOS. It's worth getting ProDOS just for its superfast convert utility that interchanges its own and DOS 3.3 files. All the lists for the software poll in this issue were generated on *AppleWorks*'s database for statistical purposes and sorting (the database even calculated the index numbers from a single formula), then were transferred to the *AppleWorks* word processor, where columns for author and publisher were edited to the nice, readable form in which you see them, and finally were converted via ProDOS to the DOS 3.3 *Apple Writer IIe* text files required by the typesetter.

There are two major problems with *AppleWorks/3 E-Z Pieces*. First, it's so incredibly simple to use that, if you're at all used to troubleshooting, you may find yourself feeling unnecessary and unwanted. Solution: Curl up next to the program manual for sympathy—it's feeling the same way—and carry on.

Second, the program is so fast and easy that, if you've played at all with Mac, Lisa, or the Apple II mouse, your hand is apt to start aching for a button-down rodent to run around the desktop. Solution: patience. A motley piper has been spotted in Cupertino and, though Apple ain't talking, that piper do play. MCT

AppleWorks, by Rupert Lissner, Apple Computer (20525 Mariani Avenue, Cupertino, CA 95014; 408-996-1010). IIe only. $250.
3 E-Z Pieces, by Rupert Lissner, Haba Systems (15154 Stagg Street, Van Nuys, CA 91405; 818-901-8828). III only. $295.

CP/M Gold Card. Since 1975, Digital Research has been licensing its CP/M operating system to other manufacturing companies. Now the folks who brought us CP/M in the first place are marketing one of their own, and it's a delight to use.

The Gold Card comes in three versions, all using a Z80B microprocessor that runs at 6 megaHertz. The operating system is CP/M Plus (CP/M version 3), which is compatible with the older CP/M 2.2 system. Files are stamped with time and data, and the card generates an eighty-column display, saving you the trouble of purchasing one separately. The three versions of the card are the basic 64K board, a 128K disk cache version, and a 192K version that includes the 64K board plus the 128K cache and a programmer's kit.

Two threateningly heavy volumes make up the documentation for the 192K version; but inside the binder is a booklet with simple instructions on how to install the board and hook up the video wiring. An explanation

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of CP/M Plus's built-in and transient commands is included and should leave even a novice CP/M user with a basic understanding of the operating system. More technical material is offered, followed by a glossary.

Digital Research provides a finely written CP/M Plus tutorial, although it sometimes assumes that the user is somewhat familiar with the CP/M environment. A more detailed instruction about assigning logical devices, such as printers and modems, would have been useful.

Once running, CP/M Plus hums right along. Without question, the 192K version operates more quickly than the other versions. One reason is because of the disk cache. Areas of memory are set aside as caches, or pockets, for data. When a sector of information is written to disk, the information is also stored in a cache. Should that sector's worth of information be needed again, the data comes from the cache instead of the disk and saves disk access time.

One of the files on the CP/M Plus utility disk is something called Help. Finally, a CP/M operating system gives users a means of obtaining information about a specific command without their having to dive into the manuals. The Help file provides general information about the command topic and further information about a specific subtopic of the command. For example, for information on the Editor and its subtopic, Commands, just type *help ed commands*. You can also add your own Help descriptions to the Help file—a worthwhile aid for any current or would-be CP/M programmer.

All versions of the Gold Card are bundled with CBasic, a powerful Basic that was designed specifically for business programming. The programmer's kit includes an assembler, utilities guide, and a symbolic instruction debugger.

The Gold Card is the finest, most complete, easy-to-use CP/M environment ever offered. This makes sense when you stop and realize that those who developed CP/M in the first place could probably offer the best hardware to complement their operating systems. The documentation is far better than most and accomplishes its purpose, allowing anyone with an interest in CP/M to use it with ease. Digital Research has struck gold. HGL

CP/M Gold Card, Digital Research (160 Central Avenue, Pacific Grove, CA 93950; 408-649-3896). 64K version, $495; upgrade to 128K, $325; 192K version, $775.

Time Is Money. By Kenneth Tepper. Turning Point Software has entered the home accounting market with a powerful, inexpensive program to make accounting easier and more orderly. Probably the most noticeable feature of *Time Is Money* is its speed. The entire program is contained in RAM and written in machine language. As a checkbook manager, the program is tremendous. It is easy to learn (there is a tutorial with sample data), easy to use, and flexible to a fault. Entering checks is simple. All the commands are based on meaningful mnemonics—"T" to enter transactions and "R" to reconcile. And whenever possible, a single keystroke is all that's needed to choose an item or enter a command.

With *Time Is Money*, balancing an account is no problem. The screen shows the previous balance, the listed credits and debits, and the final balance. Finding specific checks couldn't be easier. You can scroll down the screen or just type in the check number, and the program will find the check automatically. Another nice feature is the running balance displayed at the bottom of the screen. This allows the user to check the total after each transaction in order to locate mistakes.

With 48K, the user can have 240 asset or liability accounts, 240 expense categories, 240 sources of income, 240 types of income, and 9 budget categories (240 with 64K).

While entering transactions, the user might find that there is no account set up for a particular expense. Instead of exiting to create the account and then reentering the transaction, *Time Is Money* allows you to enter the transaction into a null account and label it later. For each transaction, the program also tracks where money came from and where it went, and is able to transfer funds from one account to another. When *Time Is Money* asks where the expense money came from, it also displays your possible answers based upon the accounts you have established. Just typing in the number next to the desired account brings it on-screen.

Time Is Money also allows you to create user-defined reports on expenses, assets, budgets, check reconciliation, and net worth. And every screen can be dumped to the printer.

For those who have used other home accounting programs, there is more good news. With *Time Is Money*, you can go back and make changes in previous transactions—one day, one month, or one year; it doesn't matter. And the number of transactions per month is virtually unlimited.

Of course, *Time Is Money* isn't perfect. While the tutorial is good, it doesn't go far enough. The Apple IIe eighty-column card is the only one the program supports, and the budget section is unclear and should have been explained better.

Generally, however, *Time Is Money* makes a very favorable impression. Kudos to Ken Tepper for this useful and friendly personal accounting package. JW

Time Is Money, by Kenneth Tepper, Turning Point Software (11A Main Street, Watertown, MA 02172; 617-923-4441). $100.

Standing Stones. By Peter Schmuckal and Dan Sommers. You are on a quest for the Holy Grail, stolen many years ago by the evil wizard, Kormath. It seems he hid the Grail beneath Stonehenge, hence the name of the game, *Standing Stones*. The Grail is guarded at the bottom of a fifteen-level dungeon by a powerful dragon named Drungankham.

As fantasy role-playing games go, this one's a stumper. The game seems to delight in killing the characters at every turn. The only thing that helps you survive at all is the ghost of Lancelot, which accompanies you for the first three levels. Just as you are about to be totally munched by five black blobs, Lancelot may bestir himself and save you. Don't count on Lancelot to rescue you from ridiculous situations, though, as he's quite likely to be asleep just when you need him.

Those familiar with the *Wizardry* screens will feel right at home with *Standing Stones*. One big disappointment with the graphics, though, are the pictures of the monsters, which look like lo-res caricatures of classic monster-types. It's very difficult to take these monsters seriously when they attack. Be careful, though; if you spend too much time laughing at their looks, they start ganging up. The game is timed, so if you don't attack fast enough, a second, third, and then fourth monster appears on the screen. As the monster images overlap each other, the effect on the screen is rather bizarre.

Combat is resolved with one attack or one spell, so take your best shot. It seems very unrealistic that one sword thrust can kill up to twenty monsters at a time. Arnold Schwarzenegger, eat your heart out!

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The magic system also has a few problems. All wizard and cleric spells are available to the player from the beginning. The only thing that improves during the game is the total number of spells that may be cast per trip. For some obscure reason, the game designers decided to limit the number of spells to thirty wizard and thirty cleric. A teleport spell requires two wizard and one cleric spell points, and the spell only works one level at a time; if you decide to teleport down to the fifteenth level, you arrive with no wizard spells and only fifteen cleric spells.

The average length of survival is ten turns. The player is forced to trudge up and down the stairs, through each level, battling monsters all the way, just to eke out a few precious new squares of map.

The game is not all hack and slash. Every so often, an oasis appears. Within an oasis are messages from previous adventurers and space for you to leave messages for those who follow. A doctor is available to heal any wounds. Weapons and armor can also be uncursed for a fee. Best of all are the races. The animal competitors resemble cockroaches, and sizable wagers can improve a bettor's fortunes. Don't become too addicted to the races, because after a few visits the oasis randomly moves around the dungeon.

This game is obviously not designed for beginners but rather for hardy intermediate to expert players who are gluttons for punishment. Perseverance will eventually win the day. Before claiming the Grail, the seeker is questioned by an old man. The questions are delightfully humorous. Some are related to King Arthur's time, some are computer-related, and some are clever jokes and riddles. "How many knights does it take to change a light bulb?" Multiple-choice answers are given, and the correct one will have you kicking yourself for pun-ishment. The ending musical, though, is worth every bit of the agony it took to get there. So trudge on carefully, and don't "Dippeth." RRA

Standing Stones, by Peter Schmuckal and Dan Sommers, Electronic Arts (2755 Campus Drive, San Mateo, CA 94403; 415-571-7171). $40.

Microbuffer II+. Now here is a printer buffer with flair. Sure, it performs the usual functions such as "talking" to the printer so that the computer can get back to work sooner. But where this buffer really shines is in its features, lots of them.

If you were thinking of buying that nifty new screen dump program, forget it. Microbuffer II+ can do that. Or maybe you were interested in buying one of those program listing enhancers—you know, the kind that shows each statement on its own line. Well, you can forget that too.

Microbuffer II+ has more than thirty different control commands to perform a wide variety of useful tasks. One command can turn the printer bell on or off. Epson owners will appreciate that! Or how about adding top and bottom margins to program printouts? You can accomplish this by pressing just two keys. By pressing two more keys, you can get a copy of the current text screen. And then there are the graphics.

If a printer has graphics capability, graphics and text can appear on the same page. In addition, a simple command will send a replica of a hi-res screen to the printer. But that's just the default. You can add a "D" for double size, an "R" to rotate ninety degrees, and even an "E" to create an emphasized (darker) printout. You can also automatically create a negative image.

The manual for Microbuffer II+ is a model of simplicity and also a delight. It contains all the needed peeks and pokes and carefully explains each feature of the peripheral while neither talking down to the experienced user nor over the head of a beginner. If you know how to type control-I then you can use Microbuffer II+.

Available with up to 64K of onboard buffer and capable of driving two printers at once, this device is a real winner. EW

Microbuffer II+, Practical Peripherals (31245 La Baya Drive, Westlake Village, CA 91362; 818-991-8200). $259 with 16K buffer memory, $299 with 32K, $349 with 64K.

Centipede. Good ideas have a shelf life; they are only good for so long. One such was "Let's take the biggest hits in the video arcades and translate them for the home computer." Atari is one company that was not slow to act on that idea but is only now realizing that their ownership of big arcade hits did not confine them to releasing home computer versions only for Atari computers. Still acting on that same good idea, they are now releasing those big arcade hits for other computers—the same hits they released for the Atari 400/800 several years ago. They are a little late.

To its credit, *Centipede* is recognizably *Centipede*. Slower, smaller, patchier . . . but *Centipede*. Period. In the long years since this game was young, the Apple has seen several creative variations on its central dynamic come down the pike, variations in which the creativity that went into the degree of variance was enforced by copyright laws.

This version, being "official," has no such enforcement and no such creativity. It's a faithful re-creation of what arcade games and home arcade games on the Apple used to be. Just as the video arcade original looks antique next to *Xevious* and its ilk, the home version looks much like the kind of Apple arcade action that was readily available circa 1980.

Had *Centipede* been released then, it would have been a good idea. AC

Centipede, Atari (1265 Borregas Avenue, Sunnyvale, CA 94086; 408-745-2000). $34.95.

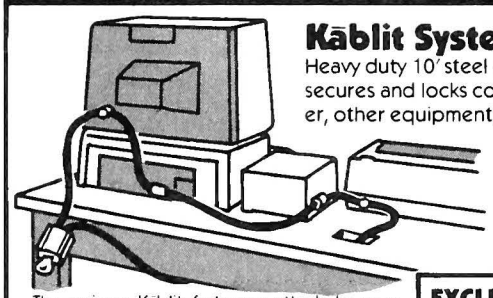
Match-Wits. By Dave Cooper. *Match-Wits* is an engrossing and highly educational variation of the old television game show *Concentration*. Using X and Y coordinates to uncover boxes, players try to score points by making matches and guessing the answer to the colorful rebus that is gradually uncovered under the squares. This striptease of the rebus (a puzzle that consists of pictures representing words) occurs each time two squares disappear after a match is completed.

After each match, a player has the option to solve the puzzle or try for another match. If none occurs, it becomes the other player's turn. Whoever solves the rebus wins bonus points.

There are six categories of play in *Match-Wits*: Sports, Word I, Cities, Famous People, Multiplication, and Animals. Each category is divided into four subcategories. (Word I,for example, has as subcategories Synonyms, Antonyms, Compound, or All.) Selection of categories, subcategories, and other functions is by menu, which greatly enhances the game's playability. There are no commands to learn and setting up the game is fast and easy.

Match-Wits's graphics are excellent. The various displays, and the rebus puzzles in particular, are sharp and practically impossible to misinterpret. Pleasant routines, which can be toggled on or off at the beginning of a round, accompany victories. Overall, the game is quite enjoyable and also educational, although the long pauses for the display of a player's choices are rather tiresome. As is the trend with most games, *Match-Wits* allows the user to create games from scratch using a secretary program that accepts paired words from the user and combines them

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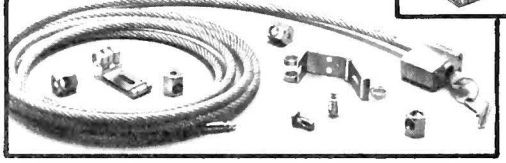
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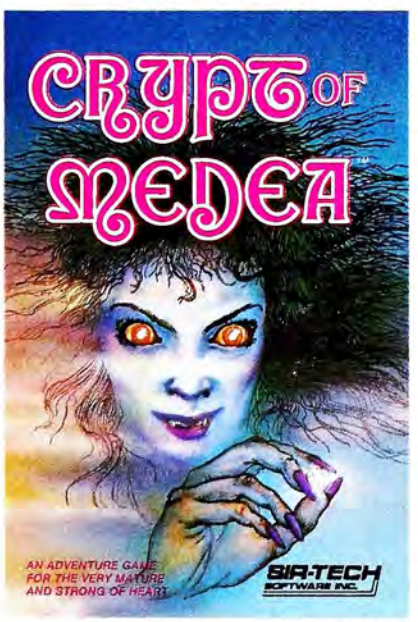
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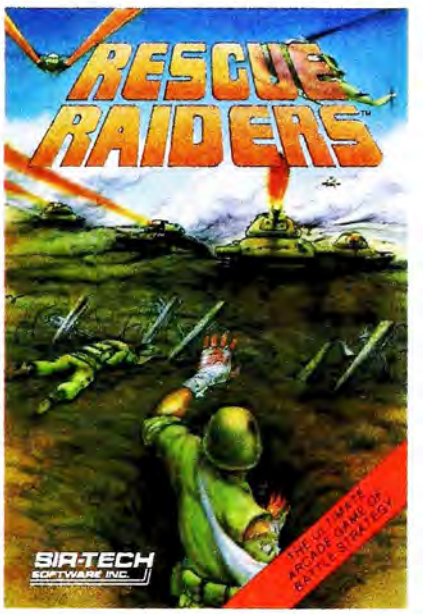
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with rebuses from the program's file.

The new pairs can then be added to the program's menu as additional categories. This feature has special educational value for anyone, including kids. How else would you learn that James Fenimore Cooper wrote *The Last of the Mohicans*. And to make this program even more desirable, the *Match-Wits* manual is quite comprehensive and even contains suggestions for new game files.

So, if you like testing your memory in an atmosphere of low-key competition, *Match-Wits* may just be your forum. MAB

Match-Wits, by Dave Cooper, CBS Software (One Fawcett Place, Greenwich, CT 06836; 203-622-2500). $29.95.

Silicon Salad. By Bert Kersey and Mark Simonsen. No programmer will want to be without this package—a grab bag of utilities, displays, demonstrations, and simple games.

Silicon Salad includes Two-Track Cat, a utility that increases the number of files that can be stored on a disk from 105 to 210. This slightly decreases actual storage capacity but is a real space-saver if you have a lot of short files. Another space-saver is DOS Killer, a utility that frees up thirty-two extra sectors by destroying DOS on disks you don't need to boot. Disk Scanner, another utility, will search for a disk's bad sectors and seal them off so you won't write on them.

And for everyone who has ever deleted five hours' work with a few graceful keystrokes, Undelete will recover the most recently deleted files.

If you have ever written a long program in Applesoft using hi-res graphics, you have probably experienced the frustration of crashing your program. This probably occurred because the memory area used for the hi-res screen is located right in the middle of the memory used for Applesoft programs. *Silicon Salad*'s Program Splitter comes to the rescue by halving your Applesoft program in order to avoid the hi-res portion of memory. Then, if you want text with hi-res graphics, Hi-Res Text Imprint takes your text and transfers it to the hi-res screen.

Besides utilities, there are several programs whose purpose is to demonstrate programming techniques and the Apple's capabilities. One surprise is a demonstration of how the hi-res screen can fit 560 pixels across—double the usual number. Less surprising, but more useful, is a subroutine that can search a string of characters to find a smaller string within it.

Silicon Salad also contains many two-line programs that help create hi-res displays. Probably no one will have use for all of the one hundred or so programs in *Silicon Salad*, but if you can use a fraction of them you're getting a good deal.

There's so much to *Silicon Salad* that it can't all be mentioned here. Suffice it to say that because of the neat utilities, two-line programs, and humorous games, users should really enjoy the process of discovery. MSK

Silicon Salad, by Bert Kersey and Mark Simonsen, Beagle Bros (4315 Sierra Vista, San Diego, CA 92103; 619-296-6400). $24.95.

Crypt of Medea. By Arthur Britto and Allan Lamb. This game is the first of its kind—a real horror adventure. The gore in *Crypt of Medea* is right up there with *Night of the Living Dead* and *Friday the 13th*. It's definitely not for the squeamish; blood and body parts are everywhere, and each death trap is more gruesome than the one before. This game makes the traps in *The Abominable Dr. Phibes* seem like kindergarten class!

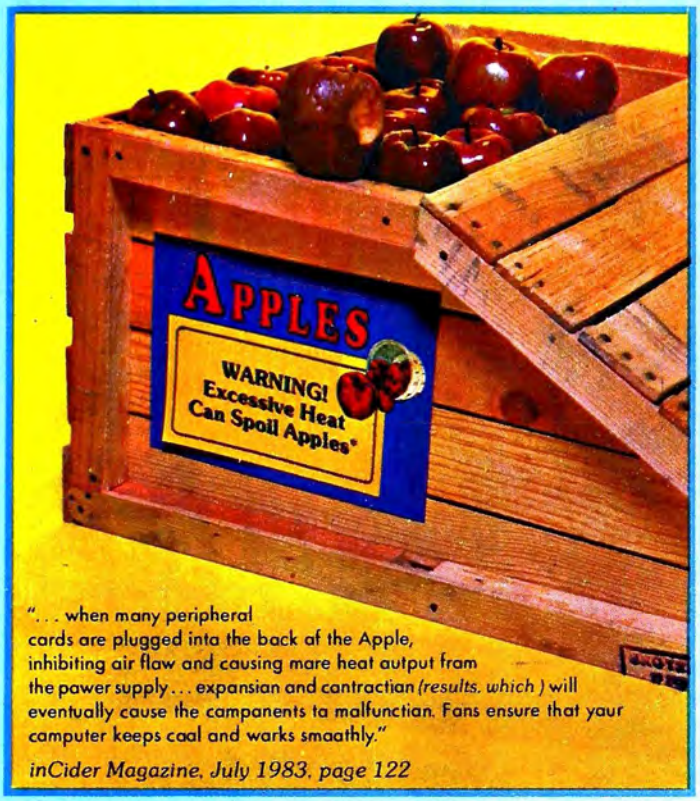
The game begins with the player imprisoned within the crypt without any apparent exit. The first problem is how to get out of the crypt, and the second is to find your way out of the game. The save-game feature is more useful than ever, as death lurks in the most unusual places.

A strong stomach is required just to read the lengthy text accompanying many actions. For example, one scene describes in detail how bodily fluids bubble and ooze out of disintegrating flesh. Not exactly dining room conversation!

Crypt of Medea is one of the new wave of games with great sound effects. The eeriness of the game is enhanced considerably by use of Sweet Micro Systems's Mockingboard. Weird wails and strange sounds abound in this journey through a psychotic nightmare. Unfortunately, the game must be viewed as just that—a nightmare. There's no attempt at a coherent story or plot. The adventurer bounces from one bizarre situation to another without any feeling of purpose. Perhaps this game actually takes the movie blood baths one step further by eliminating the needless veil of plot.

An unusual manual is included with the game. A list of the keywords

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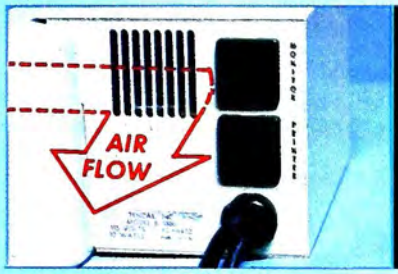


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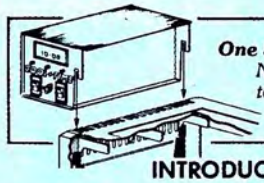


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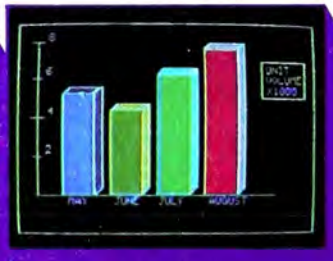


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is included, so no player will be bogged down with the problem of trying to find just the "right" word. The back of the manual contains two helpful sections. In this age of hint sheets and solution books for adventure games being *sold* by the companies, Sir-tech throws in hints for free.

As an adventure game, *Crypt of Medea* has several very challenging sections. Much of the game is hidden from view, so the hi-res pictures don't give anything away. Strange as it seems, the pictures in the game are not all that dreadful to view. It's the text that really raises hairs on the back of the neck and wrenches the stomach. Good thing that George Romero didn't do the artwork!

Sir-tech has taken care to label the game "for the very mature and strong of heart." They also do not recommend it for players under fifteen years of age, possibly making it the computer industry's first PG-rated adventure game. Devotees of horror movies will revel in the twists and turns of the game, yet a breath of fresh air at the end of the game is very appropriate. **RRA**

Crypt of Medea, by Arthur Britto and Allan Lamb, Sir-tech Software (6 Main Street, Ogdensburg, NY 13669; 315-393-6633). $34.95.

Professional Tour Golf. By Henry Richbourg. Tired of looking for lost balls? Winter got you down? Cheer up; Strategic Simulations has come to the rescue with its latest entry into the computer sports world, *Professional Tour Golf*. Now you can play a round of golf with the likes of Arnold Palmer, Craig "The Walrus" Stadler, or the "Golden Bear" himself. The master disk contains twenty of golf's most prestigious names. Options include playing with any three of these at one time, playing with three of your friends, or just sitting back and letting the computer control all four players.

The first thing required is to input your characteristics (average driving distance, maximum direction variance) and to rate your putting ability for assorted distances. Once you figure out your handicap, you can compete with the golfers of your choice.

Each hole is displayed on one screen, making it much easier to see your ultimate goal. But that doesn't mean that it's any easier to get there.

Lots of golf hazards are here to make the game interesting: wind, woods, water hazards, and sand traps. Many of the holes contain doglegs that will tempt even the most conservative golfer to try to cut the corner. Although you'll probably never beat SSI's version of Arnold Palmer with this tactic, you may be able to trounce your human opponent. Keep in mind, though, that there is nothing quite as frustrating as taking three or four shots to get back out of the woods.

Included in the package are two golf courses, with more promised soon. Apple Tree is a collection of some of the toughest and most challenging holes from different courses around the world; Pebble Beach is a reasonably accurate facsimile of the real course of the same name. Other courses currently under development are Merion, site of the 1981 U.S. Open; Oakmont, site of the 1983 U.S. Open; and of course, the Augusta National Golf Club, annual site of The Masters Tournament.

Die-hard purists might not appreciate the putting segment of the game, due to its limited user input. After all, Arnold Palmer's missing a one-foot putt doesn't exactly provide for a believable round of golf. Or does it? Hale Irwin can testify to that after his similar bout with fate during a PGA tournament. In any case, *Professional Tour Golf* is an excellent representation of playing out on the links. It's a well-thought-out, highly statistical simulation of one of the greatest games on earth. **DAD**

Professional Tour Golf, by Henry Richbourg, Strategic Simulations (883 Stierlin Road, Building A-200, Mountain View, CA 94043; 415-964-1353). $39.95.

TK!Solver. By Dan Bricklin and Robert Frankston. This incredible program is the latest offering from the creative team that brought the world *VisiCalc*. Bricklin and Frankston have developed the next generation of computer modeling. Not only can the model do the standard "what if," it can also work backward to solve a problem.

This program is definitely not for everyday home applications; rather, it is designed for professional use. Scientists, accountants, engineers, chemists, physicists, and teachers will delight in the new, powerful tools put at their disposal.

Models can be either simple or complex. They can even be built to incorporate large sets of variables. Working in both directions, *TK!Solver* trades variables off against each other until an optimum balance of variables produces the best answer. An engineer could easily find the design constraints for a bridge by using this approach. After developing a model for a simple suspension bridge, one need only input the distance between shores, and the computer will generate the design factors. Changing the tensile strength of the steel beams will show the engineer how other conditions would be affected. Intricate financial modeling can also become clear-cut in a flash.

Learning how to use this program is not easy, despite the program's excellent indexed manual. Many of the concepts inherent in the power of the program require a lot of practice and examples to understand. Allow a week or two to get acquainted with this program.

Building a model is a slow and painstaking process. Speed will come to those who can conceptualize their models in advance. Fortunately, Software Arts has come to the customer's aid. The company is selling additional application models called *TK!SolverPacks*. So far, three packages have been released: *Mechanical Engineering*, *Financial Management*, and *Introductory Science*.

The engineering pack includes handy models on heat transfer, elastic bending of beams, fluid flow in pipes, moments of inertia, and hydraulic system analysis design. The financial pack delves into loans, bonds, cost of equity, and analysis of operating and financial leverage. With the science pack, Software Arts shows the educational value of *TK!Solver*.

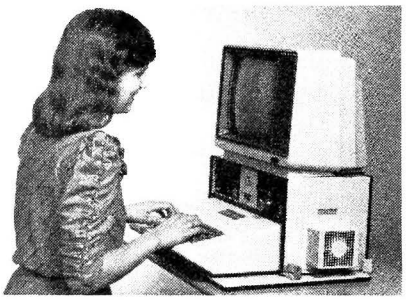
Unfortunately, the program is so large that some severe hardware restrictions apply. Because *TK!Solver* was originally written for the IBM PC, it requires most of the same hardware as the PC: 128K and an eighty-column display. Such is the awesome power of this program that people are likely to buy computers just to be able to run it!

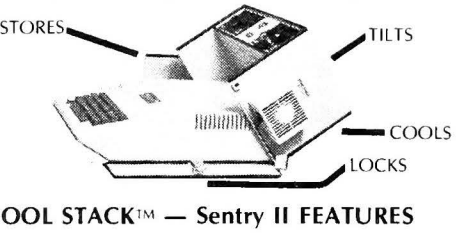
TK!Solver has some really fascinating features. It can do iterative solving via approximations when asked to handle equations that can't be solved directly, such as determining the value of exp (x)=2−x+y. The program also conveniently handles different units of measurement and automatically converts answers to specified units. Tables and graphs can be generated in an instant. One very handy feature is the built-in help screens. Just type "?" anywhere in the model, and help is on its way.

This program is a whole new advance in the art of building computer models. It will probably be a long time before any competent look-alike emerges. *TK!Solver* is as far advanced beyond *VisiCalc* as *VisiCalc* is beyond the old green paper spreadsheets. **RRA**

TK!Solver, by Dan Bricklin and Robert Frankston, Software Arts (27 Mica Lane,

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Forbidden Quest. By William Pryor and Donnel Cox, with artwork by Frank Cirocco, Michael Golding, and Wally Wood. The artwork credits here do not refer to screen art—*Forbidden Quest* is a straight text adventure. Where the art does appear is in five prints, four of which are black-and-white. The fifth, drawn by the late great comics illustrator Wally Wood, is in color. The prints aren't provided strictly for their aesthetic value, however; clues for the adventure are hidden in them.

Sure, the prints are an original, attractive enhancement to *Forbidden Quest*, especially for adventurers who are comic book collectors. But a flashy gimmick does not a superior adventure make, as Pryor and Cox are obviously well aware. They have put together an excellent game, one that stands on its own. The artwork is a bonus.

The game begins with this scenario: It is sometime in the far future, five centuries since a civil war crippled the trade routes among members of the United Alliance of Planets. Humanity is in the midst of a slow regression into barbarism, and technology is failing. You've just "borrowed" a still-working piece of technology, the starship *Paradox*, and are on a quest that could save humanity. You must find an alien civilization that is rumored to exist at the far end of the galaxy. If you can locate the aliens, you may be able to use their superior knowledge to revitalize your species.

But it's not as simple as that. When the game opens, your starship is damaged and you are injured. The planet rumored to hold the object of your quest lies dead ahead, but landing a crippled ship will be exceedingly difficult. And if you do survive the landing, there's equipment to find and a planet to explore.

The structure of *Forbidden Quest* is, as you may have guessed, somewhat modular. There are a number of goals to reach within the overall adventure, and each of these occupies your attention fully while at the same time leading to yet another goal on the way to solving the adventure. Many of the goals can be reached by using logic (as you do when escaping from the damaged spacecraft), but many more require intuition, searching for clues, and experimentation. This combination results in a game that requires thinking on your feet, as well as careful consideration of the clues provided in the artwork and in the game itself.

Naturally, this isn't easy—but who wants to solve an easy adventure? The documentation advises you to save the game frequently. This is good advice, and especially worth following while you travel through a rather deadly maze. The game responds quickly to commands and will accept five or more in advance while printing the response to the first command.

Room descriptions can be toggled between detailed and brief. Text can also be dumped to a printer to provide a record of moves.

This program is fairly intelligent. The parser can accept multiple-word commands, synonyms, and multiple commands linked by a period or the word "then." This simplifies things, since you don't have to play games trying to communicate with the program.

There are also time limits. If the spacecraft isn't brought into correct landing sequence before a certain number of moves, you're dead. Then there is the scoring feature: The maximum possible score is 3,500, and those points don't come easily!

Barring a few typos and misspellings, the documentation is excellent. If you read the seven-page manual, there is no way you can foul up a save or become frustrated with the parser.

Forbidden Quest may not match the challenge of *Suspended*, but it does provide quite enough puzzles for seasoned adventurers. (The manual even gives guidance for new adventurers.) *Forbidden Quest*'s plot is intriguing and has some of the appeal of an Andre Norton novel.

This is a superior program. The publisher promises another adventure soon—this one with all-color artwork. **MAB**

Forbidden Quest, by William Pryor and Donnel Cox, Pryority Software (25570 Chiquito Place, Carmel, CA 93923; 408-625-0125). $39.95.

Basic Accounting. By Dennis R. Jarvis. Based on a single-entry bookkeeping method, *Basic Accounting* is refreshingly simple and easy to use, making it ideal for home budgeting. You don't have to be skilled in accounting to use it; anyone who can make entries into a conventional bank register should be able to use this program easily. *Basic Accounting* automatically calculates annual figures and provides a variety of reports.

Completely menu-driven, the program leads the user through a multitude of options, which are displayed on the screen at all times; it's hard to become lost. The software is the ultimate in friendliness, going so far as to thank you for using it each time you log off.

The package is ideal for anyone who knows little or nothing about computers, but it doesn't slow down someone who wants to move quickly through the program.

Designed along the same lines as a database management system, *Basic Accounting* also performs inventories of household items, liabilities, assets, and stock portfolios.

It's not too likely that home or small business accounting needs will exceed the program's file limits; you can have as many as one hundred files each for budget categories, payees, or payers. File names can be as long as twenty-five characters. Once those have been input, abbreviations can be used instead of the whole name. For example, if a check is regularly written to Power Electric Company, you may wish to abbreviate it as PE, which the program will interpret and print on the check as Power Electric Company. This is an excellent and practical feature, as it saves time and energy and reduces the chance of typing errors.

There's also the option of linking two or more files and saving them as DIF (data interchange format) files in case you wish to load the information into a spreadsheet (such as *VisiCalc*) in order to manipulate the data. Once saved as a DIF file, data can be loaded into any program that accepts the format.

Basic Accounting also provides graphics and lets you perform arithmetic operations such as averaging and trend analysis. Of course, graphs can be printed.

The program performs automatic transactions such as making monthly payments and deducting them from the checking account.

A wide variety of reports is available: Audit reports total all budget codes and can be performed for a particular month or for a group of months; budget reports print all budgeted items and their figures for comparison; search reports give information according to specified criteria; and income and expense reports track expenditures and credits to the account. All reports can be generated as detail reports or as summaries.

Although the manual implies that the program was written for home use, *Basic Accounting* can also be used in small businesses. Because of

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O	DOUBLEWIDE EMPHASIZED DOUBLESTRIKE
P	CONDENSED DOUBLEWIDE
Q	CONDENSED DOUBLEWIDE DOUBLESTRIKE
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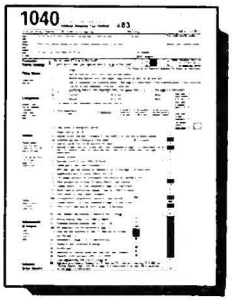
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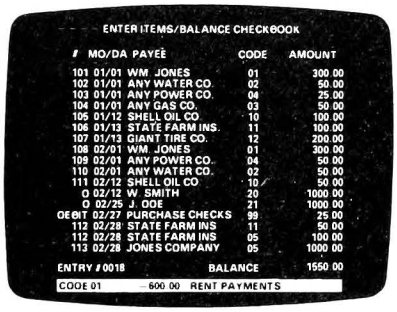
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- "I will be using it a lot in the coming years. It beats my present VisiCalc check register." Paul Koskos, Potomac, MD.

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 give 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 codes any time without affecting data.



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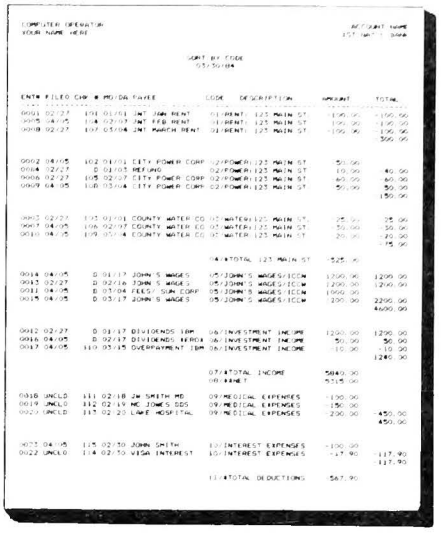
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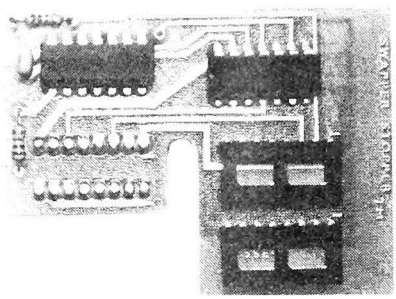
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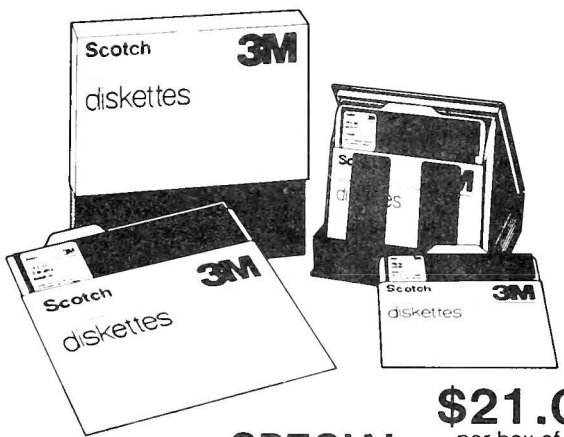
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the limit on categories, payees, and payers, it would be too small for medium to large companies, but for a small business it should be quite adequate.

Basic Accounting has set a high standard for home accounting systems. It is highly recommended for anyone who requires simple accounting functions. PRM

Basic Accounting, by Dennis R. Jarvis, Firefighter Software (31245 La Baya Drive, Westlake Village, CA 91362; 818-991-8200). $89.

Learning & Loving It! Division of Whole Numbers. By Darlene Borns. Certain things in life are not fun. Washing windows, folding laundry, and doing long division spring immediately to mind. *LALI* (despite a title that makes it sound like a Leo Buscaglia pop-psych handbook) has made this last chore about as palatable as it can be by providing routine practice in one of the more tortuous of basic arithmetic skills.

Four options are included—beginning, intermediate, and advanced long division with progressively larger numbers, and a very simple timed game. The solitaire play pits you against "Apple Annie" in a race to solve a beginning-level problem.

In the beginning-level drill, correct responses to problems are rewarded with a happy apple-shaped face, the child's name, and any of a dozen congratulatory comments ("hot dog," "yahoo," and the like). Incorrect answers elicit a frowning face and the correct answer.

In the two harder levels, the amusement factor is eliminated in favor of straightforward practice. The player selects ten problems at a time and can choose the number of digits in the divisor, as well as evenly divisible problems or those with remainders.

Three aspects of *LALI* can be confusing. First, a white dot (the cursor) showing where the number is to be entered is just small enough that at first glance it can be mistaken for a decimal point. Second, the digits in a number may be different colors, which can make a two-, three-, or four-place numeral difficult to recognize immediately. Finally, with the "help" option selected, you can change an entry if it's incorrect. But without "help," you're stuck with your initial choice; you may have a correct quotient, but it will be marked wrong if there is any error in the figuring below the long-division bar.

The graphics in *LALI* are simple but sufficient. The colors are pleasing, as is the generous size of the on-screen numbers and letters. As for sound, it's binary. The computer makes a high-pitched beep for a correct digit, a low-toned buzz for an incorrect one. Thankfully, both can be turned off.

All in all, *LALI* (there are five others in the series—addition, subtraction, multiplication, and prealgebra one and two) is a decent little program but hardly a deal; CBS Software's *Success with Math: Multiplication and Division* provides similar drill in both operations at a lower price. In any case, motivated children from eight to fourteen will find *LALI* of benefit.

Of course, there will always be the smart-aleck kid who inquires, "But why do we have to learn long division at all when we have the computer to do it for us?" Send that one off to do the laundry or the windows. JP

Learning & Loving It! Division of Whole Numbers, by Darlene Borns, Borns Software (19841 Sea Canyon Circle, Huntington Beach, CA 92648; 714-536-3644). $39.95.

XPS-Diagnostic II and **XPS-Diagnostic IIe.** By William G. Peters. These two diagnostic utilities are new versions of XPS's *Apple-Cillin* and *Apple-Cillin II*.

The programs are short, and they punch right through to the point; small on words, big on action. The manual reflects the approach, seldom devoting more than a paragraph to each test procedure. These utilities do the job and give you the answers they promise and little more. If you're computer hardware-ignorant when you open the package, you won't be a technician when you put it away. The exception to this is the manual's section on disk drive speed, which thoroughly explains the test and how to make adjustments.

Tests performed by the utility include checking RAM and ROM chips, the keyboard, paddles, the 6502, disk drive speed and head movement, peripheral cards, disks (bad sectors), and the monitor.

You can run tests individually or link them to run as one multitest. A print mode lets you generate a hard copy of test results. WP

XPS-Diagnostic II and *XPS-Diagnostic IIe*, by William G. Peters, XPS (323 York Road, Carlisle, PA 17013; 717-243-5373). $49.95. ■

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Picking Up the Tab

BY BILL PARKER

Readers often write to us asking about how to use their printers. As a family of peripherals, printers seem to be among the most complicated—and perhaps least well-documented—devices that most people add to their Apple II systems. We'll try to answer questions here that will be helpful both to the letter writers and to their fellow users everywhere.

Please send me any information you can on tabbing with an Apple IIe and an Epson FX-100 printer. I am trying to make charts with tabs and can't get the columns straight.
Rulon Winward, Preston, ID

Answer:

Let's take a look at the number one bug in horizontal tabbing with the Epson, the use of control-I. The tab-setting command for the Epson printer is escape D. The tab command itself is control-I or CHR$(9). In theory, horizontal tabbing with the Epson is supposed to be done like this:

```
100 PRINT CHR$(4);"PR#1"
120 PRINT "12345678901234567890123456789O"
130 PRINT CHR$(27);"D";CHR$(20);CHR$(0);
140 PRINT CHR$(9);"^TAB20"
150 PRINT CHR$(4);"PR#0"
```

The string printed by line 120 is a column ruler, so we can see where the tab goes. In theory, the output is supposed to look like this:

```
12345678901234567890123456789O
                    ^TAB20
```

In reality, it looks like this:

```
12345678901234567890123456789O
TAB20
```

What happened? The problem here is caused by the printer horizontal tab command, CHR$(9), in line 140. This is the same command used by printer interface cards to select special card functions. A well-known example of this is *print CHR$(9)"80N"*. You must remember that anything sent to the printer is first sent to the printer interface card, where it can be intercepted. If a CHR$(9) is sent, the card gobbles it up along with the next character, thinking that the characters are a command for the card. Because of this misunderstanding, the control-I and the next character never make it to the printer. That is why *^TAB20* in the example is not tabbed and why the ^ character in front of the *TAB20* never got printed.

I Only Have I's for You. This little-known quirk in printer protocol is one of the most baffling and mysterious things you'll ever run across in the land of dot matrixes. The problem is that both Apple Computer and various printer manufacturers picked the same command, control-I, for different uses. Apple set the standard for printer interface card "set up" commands as control-I because I stands for interface, just as control-D stands for DOS. Printer manufacturers, on the other hand, picked control-I as a printer horizontal tab command because the ASCII name for CHR$(9) is HT (horizontal tab). The companies never realized that there would be a compatibility problem; it was up to the poor user to discover it.

Fortunately, there is a solution. Most printer interface cards allow you to change the control-I interface command to some other character, thus freeing up control-I to be used by the printer as a tab command. For example, the interface command can be reset to the relatively innocuous control-A with a simple

```
PRINT CHR$(9);CHR$(1);
```

Now, CHR$(1) will grab your printer interface card's attention for commands such as *print CHR$(1)"80N"*, while CHR$(9) can be used safely for printer tabbing. The control-I setup code can be restored by reverse application of the same principle: *print CHR$(1);CHR$(9);*. Here's how tabbing can be done successfully:



```
100 PRINT CHR$(4);"PR#1"
115 PRINT CHR$(9);CHR$(1);: REM RESET CONTROL-I TO
    CONTROL-A
120 PRINT "12345678901234567890123456789O"
130 PRINT CHR$(27);"D";CHR$(20);CHR$(0);
140 PRINT CHR$(9);"^TAB20"
150 PRINT CHR$(4);"PR#0"
```

Output:

```
12345678901234567890123456789O
                    ^TAB20
```

The sample output looks a lot better, but there is still one nagging problem: The string was tabbed to column 21, but we specified column 20 in line 130. What happened? Well, if we think of tabbing as beginning at column 0 instead of column 1, things look a lot better. Change line 120 to

```
120 PRINT "012345678901234567890123456789O"
```

Output:

```
012345678901234567890123456789O
                    ^TAB20
```

There is a very strong possibility that resetting this pesky control-I "bugaboo" will solve the majority of your printer tabbing problems. Give it a shot and let us know.

Fast Times at ASCII High. Another thing that can get you into trouble with your printer is high ASCII, also known as "Apple" ASCII or negative ASCII, which makes use of something known as the *eighth bit*. The eighth bit is also known as bit 7, the high bit, the most significant bit, and the MSB.

By way of explanation, a committee met some time ago and assigned a number to just about every character imaginable. The results were put together in a chart known as an ASCII table. (ASCII stands for American Standard Code for Information Interchange.) The numbers range from 0 to 127, for a total of 128 characters. The upper-case alphabet runs from 65 to 90.

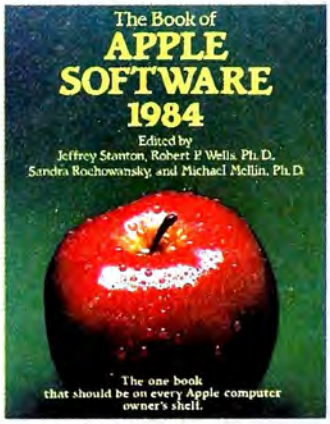
The basic working area of computer memory is called a *byte*, which can hold any number ranging from 0 to 255. This means that a byte can hold a value from either one of two ASCII tables, one that ranges from 0 to 127, or a duplicate ranging from 128 to 255. Try it. Typing *print CHR$(65)* will print the letter A, and so will the "duplicate" ASCII value, CHR$(65+128) or CHR$(193). As far as output is concerned, there is really no difference as to which ASCII set you use.

A byte consists of eight bits, which are numbered from 0 to 7 (hence, the eighth bit is actually bit 7). Each bit has a value that is a power of 2. The eighth bit has a value of 2^7, or 128. When you use values within the range of CHR$(0) to CHR$(127), you are working with the ASCII set that has the high bit (bit 7) turned off (normal ASCII). When you use values from CHR$(128) to CHR$(255), you are using the ASCII set that has the high bit on (high ASCII). You should note that Applesoft outputs all characters in high ASCII, whether or not you use normal ASCII values.

You can get into trouble with this scheme if you have a printer that uses a special graphics or non-ASCII character set in the high ASCII range. The manufacturers of cheaper printer interface cards try to help you with this problem by (believe it or not) cutting the line that transmits the high bit. With these cards, you don't run the risk of printing out strange graphics characters when you really want normal text. You also can't send the eighth bit to the printer when you need to (for instance, in hi-res screen dumps). More will be said on this topic later. For now, stay with normal ASCII: CHR$(3) is a lot clearer than CHR$(131) when you're trying to show a tab setting at column 3.

Bring Out the Raid. An unexpected bug in the FX-80 operating system was discovered during research on Winward's question: the FX

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apparently turns off the tabbing ability if it is made to tab at column 13. Try this program:

```
140 PR#1
150 PRINT CHR$(9);CHR$(1);: REM RESET CONTROL-I
160 PRINT "01234567890123456789012345678901234567890"
170 PRINT CHR$(27);"D";CHR$(7);CHR$(13);CHR$(20);CHR$(26);
    CHR$(0);
180 PRINT CHR$(9);"^TAB1";
190 PRINT CHR$(9);"^TAB2";
200 PRINT CHR$(9);"^TAB3";
210 PRINT CHR$(9);"^TAB4"
220 PR#0
```

Here's what happens when you run it:

```
01234567890123456789012345678901234567890
        ^TAB1 ^TAB2^TAB3^TAB4
```

Try replacing the 13 in line 170 with 14 and everything works well:

```
01234567890123456789012345678901234567890
        ^TAB1  ^TAB2^TAB3^TAB4
```

Apparently, the FX confuses a tab setting of 13 with a return character. This bug does not exist with Graftrax Plus. If anyone out there can shed a little light on this, please write in!

There is one other troubling thing about this example: It beeps! A tab setting of CHR$(7) is also known as the ASCII code BEL—try *print CHR$(7)* and see what happens—which causes your Apple to beep when the character sent to the printer is echoed to the Apple for printing on the video screen. This can be prevented by turning video echo off with a *print CHR$(9)"N"*. (Note that this is not "80N"—see December's bugaboo box.) This can be incorporated into the program by adding line 145:

```
145 PRINT CHR$(9)"N";: REM KILL VIDEO ECHO
```

Note that this must be done *before* the control-I is reset to some other character so that the CHR$(9) in line 145 can be recognized by the printer interface card. Alternatively, you could do it after resetting control-I to control-A by using control-A instead: *print CHR$(1)"N";*.

With these common problems and a few others, we now have some prime candidates for the bugaboo box (see figure 1).

1. It's *Epson*, not *Epsom*.
2. It's *Graftrax*, not *Graph tracks*, and so on.
3. The control-I interface command must be reset to some other character before tabbing can be performed with the Epson. This can be done with the command *print CHR$(9);CHR$(1);*.
4. Turn off video echo if you hear beeping, get strange output on your screen, or are having trouble with hi-res screen dumps and bit image graphics. This can be done with the command *print CHR$(9);"N"*. (Note: This is *not* "80N".) If control-I has been reset to another character, substitute that character for the CHR$(9).
5. It's usually better (and clearer) to use normal ASCII, CHR$(0) through CHR$(127), instead of high ASCII, CHR$(128) through CHR$(255). High ASCII can be converted into normal ASCII simply by subtracting 128: CHR$(3) = CHR$(131 – 128).
6. High bit, eighth bit, bit 7, most significant bit, MSB, high order bit, and so on are all ways of saying the same thing: Add 128 to the value in question. CHR$(131) = CHR$(3) with the high bit on.
7. A bug in the FX operating system turns tabbing off after it is made to tab at column 13.

Figure 1. April bugaboo box.

Next we have a common question on printing modes:

Just what is the difference between emphasized and double-strike modes?
Jock Root, North Hollywood, CA

Answer:

Both modes make characters print darker, and darker dot-matrix characters look a heck of a lot better than normal characters. The modes

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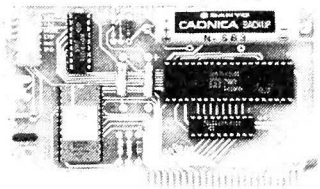
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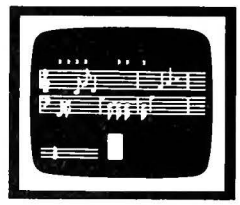
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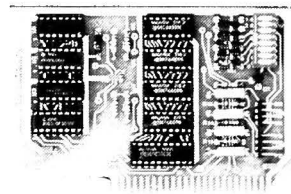
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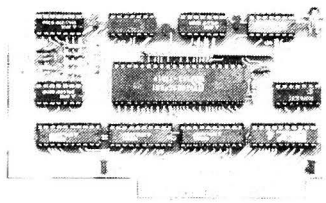




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VISION80	MORE	YES	YES	NO	NO	YES	NO	NO	NO
OMNIVISION	MORE	NO	YES	NO	NO	NO	NO	YES	YES
VIEWMAX80	MORE	YES	YES	NO	NO	YES	NO	NO	YES
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VIDEOTERM	MORE	NO	NO	YES	NO	YES	YES	NO	YES

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differ in how they do it, though. Emphasis mode works by overstriking the dots in each character horizontally; double-strike does it by overlapping the dots vertically, as shown in figure 2.

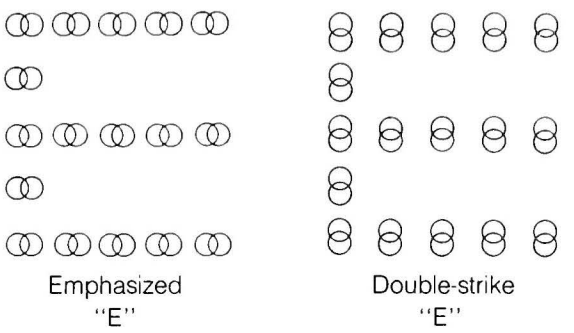


Figure 2. Emphasized and double-strike modes.

Double-striking is usually used to "emphasize emphasized mode" or to improve bit image graphics. It has a slight disadvantage, however, in that it has to do a tiny line feed of 1/216 of an inch to accomplish the overlapping, and sometimes the paper-feeding mechanism in the Epson just isn't up to that sort of precision. The result is an occasional slight gap, which usually appears as a fine white horizontal line in hi-res screen dumps. Another problem with line feeding in Epsons not equipped with Graftrax Plus (or later versions) is that the line feeds are not counted in form-feeding calculations. This results in a gradual "creep" of lines down the page. This is especially noticeable with things like mailing labels when the names begin to print below the correct starting line. The only cure for this is to upgrade to the Graftrax Plus chip or to replace your MX printer with an RX or FX printer.

Now for the number one question on everyone's lips: "How the heck can you do superscripting with *Apple Writer II*?"

The Epson command for superscription is:

```
PRINT CHR$(27);"S";CHR$(0): REM SUPERSCRIPT ON
PRINT CHR$(27);"H": REM SUPERSCRIPT OFF
```

The problem here is that the NUL, CHR$(0), cannot be entered into the text stream when using *Apple Writer II*. The way to get around this problem is to create a glossary file for *Apple Writer II* to use. This means that you must write a Basic program to create a normal DOS 3.3 text file. The file should contain the superscript on/off information, along with a command name to tag it. The text file can be created by an Applesoft program or with some sort of text editor that generates standard DOS 3.3 text files. Even *Merlin* or *Big Mac* can do this. Just set tabs to 0 in the editor and write the finished file out to disk.

John McKee wrote an extensive glossary file for the *Sandy Apple Press* (newsletter of the San Diego Apple Corps) some time ago, a brief portion of which is reproduced here:

```
10  REM CREATE EPSON GLOSSARY. SUBMITTED BY JOHN
    MCKEE.
20  PRINT CHR$(4)"OPEN GRAFTRAX PLUS": REM (SIC)
30  PRINT CHR$(4)"WRITE GRAFTRAX PLUS"
40  PRINT "S";CHR$(27);CHR$(83);CHR$(0): REM SUPERSCRIPT
    ON
50  PRINT "D";CHR$(27);CHR$(72): REM SUPERSCRIPT OFF
60  PRINT CHR$(4)"CLOSE"
```

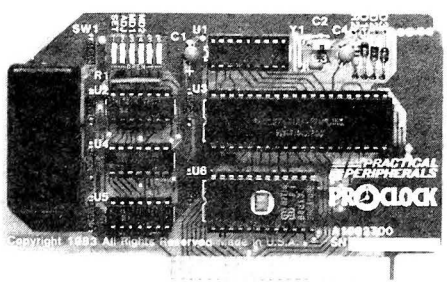
When you've made the glossary file, boot up *Apple Writer II* and tell it about the glossary file by selecting special functions menu option Q5 and loading the file you just created (Graftrax Plus in this example).

To use your new glossary file commands from within *Apple Writer II*, simply press control-G followed by S (and make sure that that's a capital S). This will turn on superscription. Control-G followed by D (a capital D) will turn it back off. If you don't like S and D, or if you want to do more special printer functions, simply change the glossary file. Glossaries can also be edited within *Apple Writer II* using the control-G command followed by a question mark. See the section on glossary files in the *Apple Writer II* manual for more details. This should help you enough to get things rolling.

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MAC 'N' LISA

BY KEVIN GOLDSTEIN

"Any barrier that exists in the machine, I intend to personally help break down."

—Burrell Smith, chief hardware designer of the Macintosh

The Macintosh is barely two months old, and already its chief hardware designer is alluding to barriers to its popularity? Is there trouble in Camelot?

Well, yes and no.

The trouble, you see, is not really with the machine, but with people's expectations for it. Expectations that fall into one of two categories.

The first category encompasses all those elements the already-computer-literate types think a computer should have, which Macintosh doesn't. Like expansion slots, color, a hard disk with high-speed dedicated interface, cursor key support, and a complex command language.

The second category encompasses all those elements the already-computer-literate types think a computer should have, which Macintosh doesn't. Like support for a letter-quality printer, a second floppy disk drive, double-sided drives, a hard disk, a surplus of memory ("surplus of memory" is like "spare money"), a database program, a telecommunications program, networking hardware, Pascal, C, an assembler, a disk copy utility that gets its job done sometime *before* your third cup of coffee . . . but you get the idea.

The difference between the two categories, of course, is that *everything* in the second category is officially on its way, whereas *nothing* in the first category is—at least not officially.

And that difference is a critical point. After all the hoopla and kudos die down, a goodly number of new Macintosh owners—particularly those looking at Mac for heavy-duty business applications—are going to find themselves quite disappointed with their new purchase, and then they're going to bad-mouth the most innovative and revolutionary product to have come down the consumer pike in a long time. And all because of a misunderstanding.

The misunderstanding lies not in the new owners' perception of what they thought Macintosh could do—it lies in when they thought it could do it. Everybody seems to have forgotten that when IBM introduced the PC, there was virtually no software that could run on it and that third-party hardware vendors' catalogs were all quite empty. Would-be programmers had to cobble together their own assemblers, and the screams about *EasyWriter I*, which for a time had the word processor monopoly, could be heard from the hot tubs of Marin County to the swamps of Boca Raton.

The situation with the Macintosh, even at the time of its introduction, was far better, and will be better yet by the time you read this. Apple had the foresight to "open its kimono" (to quote one of the better-known hardware suppliers) to the outside hardware and software vendors many months *before* the official introduction, with the delightful result that in the coming months we are going to witness an absolute flood of third-party hardware and software. At that point, Macintosh is going to be able to do everything everyone thought it could do, and then some.

Nor should you doubt that all those goodies are really going to be delivered. Developers and manufacturers jumped on the IBM PC bandwagon because the machine was mildly better than its existing competition and because it was built by an institution with more stability (not to mention a better balance sheet) than the federal government—or put more rudely, because the PC looked like a ticket to quick riches. The response of outside developers to Macintosh has been far different—this time around, they're supporting a new machine because they *like* it, and because they're excited by the possibilities it offers. And the result of that feeling is that, first, we're going to see practically every important (read business-oriented) IBM PC program rewritten for the Macintosh, and many important Apple (read business, games, and indeterminate) programs as well; and second, we're going to see programs written specifically for Macintosh that run rings around anything your plain vanilla PC can do, did do, or will ever be able to do. That second category of programs, while far more impressive than the first set, will take a while—recall that the first round of programs for the IBM PC were almost without exception rewritten Apple II programs. But the new programs written just for Mac and therefore able to take advantage of all its power will be worth the wait.

In some cases it's going to take a while before even current applications can be ported to Macintosh. Lotus, for example, has let it be known that it will release a Mac *1-2-3* . . . as soon as the 512K machine is available. (Officially, the 512K machine or upgrades to current machines will not be available until 1985. If you early buyers are wondering whether you're stuck with 128K machines, no, you're not. Current machines will all be upgradable by your dealer, via a simple board swap. As a matter of fact, Apple *wants* all Macs to have the same amount of memory, since that gives the software developers a standard configuration to aim at. For that reason, the company will probably price the upgrade quite reasonably.) And Microsoft's *Word* will be delayed, since the company is having trouble getting it to run as fast as it would like—as originally written, *Word* assumes more available memory than the 128K Mac has. (In the meantime, if you're more interested in writing than in fancy formatting and printing, *MacWrite* is an utterly useful and absolutely charming little program, a real joy to write with. For many purposes, it's better than *Word*, *WordStar*, and the whole lot of them.)

As for the rest of the list: *MacTerminal* should be available in the late spring or early summer, or you can get a terminal program written in Microsoft Basic free through CompuServe. The new version of the Finder and System, possibly released by the time you read this, should speed up disk copying, and external disks are now available from Apple, which should make that whole problem a moot point. Hard disks, *de rigueur* for heavy business applications, should be available from Tecmar sometime this month or next and from Davong about the same time or just slightly later.

Now, as for that first category of items, things that all you computer-literate types take for granted in a computer, but which Apple has announced no plans to support: Burrell Smith's determination to make Mac succeed is clearly evident in the quote at the top of this column, and the probability is that it's matched by everyone in the Mac group, as well as everyone at Apple. There's a *need* for a machine just like Macintosh I, with no expansion slots at all. There will also be a need for a "Macspandable," and a "Maccolor," so you can bet we'll see them in due course. As for a high-speed hard disk—I'll bet you my Macintosh against your IIe that Apple will have announced its *own* hard disk, complete with high-speed interface, and possibly mounted internally, before the year is out. Macintosh, as it now appears at ComputerLand, is just the opening note in what promises to be a stirring song.

None of this should be interpreted to mean that you shouldn't buy a Macintosh yet. If you want one, by all means—go out and buy one. Just realize that it's going to take a little while before Mac can do everything you thought it could , and a little longer than that to do a bunch of things you never thought it could do. In the meantime, you can enjoy being in on the start of what is sure to be viewed as the opening shot in a new era.

Thank God that, with everybody out there introducing PC clones, Apple still has the guts to go its own way.

Tech corner (for pioneers only—no calls if it doesn't work):

If you've got a Mac but haven't yet been able to get your hands on MacModem, you can use a standard modem, though you'll need to make up a cable. Here's the pinout of the phone port:

1. Gnd
2. +5
3. Gnd
4. Transmit Data +
5. Transmit Data −
6. +12
7. HSK, an input (high speed clock)
8. Receive Data +
9. Receive Data −

You need only concern yourself with pins 1 (or 3), 4, and 8, which are ground, transmit data and receive data, respectively. You'll need a male DB-9 for the Mac end of the cable, and you may need to jumper some pins on the modem end of the cable, depending on your modem. For communications software, download the terminal program from CompuServe. Though written in Basic, it's been reported capable of running to 9600 baud, which should give you some idea of Mac's power.



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The Plot Thickens

It's graphics time. If you've been doing all your programming on a monochrome monitor or a black-and-white television set, it's time to hook up your computer to the color set in the living room. If your family objects too strongly, warn them that the alternative is to buy a color monitor with a price tag of at least $300. That'll shut them up, at least until *Hill Street Blues* comes on.

There are two kinds of graphics on the Apple II: *lo-res* and *hi-res*. On certain well-configured newer models there is also *double hi-res*, but we can ignore that for now because Applesoft has no commands for it. Lo-res and hi-res are short forms of *low resolution* and *high resolution*. Resolution refers to how the graphics resolve into dots on the screen, or something like that. The bottom line is that lo-res graphics mode allows you to plot blocks in a 40-by-48 grid using any of sixteen colors, while hi-res graphics mode allows you to plot points on a 280-by-192 grid in six colors.

Almost all graphics programs use hi-res graphics, except those written specifically to demonstrate lo-res mode. The exceptions usually take the form of kaleidoscopes or color bars. Nevertheless, tutorials almost always begin by looking at lo-res graphics, and this one is no exception. The reasons for this are that lo-res graphics are simple to understand, present fewer and less cryptic commands to memorize, and can usually be dispensed with in one lesson. So be it here.

Feet Wet Getting Time. The best introduction to graphics is usually the direct approach. Because graphics are so visual, you can just start typing commands at the keyboard and see what they do. Try these:

```
GR
COLOR =15
PLOT 0,0
```

The first command in the series, *gr*, turns on the lo-res graphics mode and clears the screen to black. It leaves you with a four-line window at the bottom of the screen for text, which is useful for typing in commands and seeing what they do. This gives you a graphics grid of forty-by-forty. There is a way to get the vertical resolution of forty-eight, as promised, but it involves a fairly lengthy digression, so let's forget about it for now and accept the restriction of having a vertical resolution of forty.

The second command, *color = 15*, doesn't do anything visual right away. It tells the computer what color to draw blocks in. The sixteen colors are numbered from 0 to 15, with 0 being black and 15 being white. The third command, *plot 0,0*, puts a white block on the screen.

The odd thing is where it puts the block. By all the rules of Cartesian coordinates, the point 0,0 should be in the lower left corner of the screen, but the Apple puts the point at the upper left corner. Why? That's just the way it is. In all of the Apple's display modes—text, lo-res, and hi-res—the origin point, 0,0, is at the upper left corner of the screen.

By the way, the color and the coordinate systems are just two of the many ranges of numbers in the Apple that begin with 0 instead of 1. Get used to it: Computers like to count from 0. The only annoying part of this convention is that there is no horizontal coordinate of forty. With forty points of resolution, you expect the last one to be forty, but it's actually thirty-nine.

You may have noticed that the resolution of the lo-res screen corresponds to the layout of the text screen. The forty columns of text are the same as the forty columns of lo-res graphics. The twenty-four lines of text are each split in half for a total of forty-eight rows of lo-res blocks. By mixing graphics and text mode, we get four lines of text and lose eight rows of graphics. The correspondence is real; text and lo-res graphics are mapped to the same areas of memory. To see graphic proof of this, type *text*, the command to go back to text mode. All that garbage wasn't there when you left text mode, ergo it was introduced by lo-res mode. Type *gr* and we'll continue.

The Line Up. Try these commands:

```
COLOR = 14
HLIN 2,20 AT 10
COLOR = 13
VLIN 2,20 AT 10
```

The commands *hlin* and *vlin* draw horizontal and vertical lines respectively. The first two numbers given as parameters are not a Cartesian X,Y pair; they are a start and an end point. In the case of hlin, they are the X coordinates for the endpoints of the horizontal line. Used with vlin, they are Y coordinates. The third number is the Y coordinate of the horizontal line or the X coordinate of the vertical line. The syntax takes a little getting used to, but we can live with it.

The final lo-res command is a function. *SCRN (X,Y)* is the only function you will run across that takes two arguments instead of one. The two arguments are the Cartesian coordinates of a point on the lo-res display. The function returns a number from 0 to 15 indicating the color currently plotted at that point. If you have been typing in commands faithfully, you should be able to type *print SCRN (2,10)* and get the number 14 for your answer.

And that is the entire body of lo-res commands in Applesoft Basic. So what can you do with lo-res? Some interesting things. It's good for big, colorful stuff. Let's try a big, colorful alphabet. This will be the largest program we've done to date in this column, but don't let that frighten you. We'll look at it in manageable chunks.

In doing graphics programs, it usually pays to design the graphics off of the computer first. In this case, we'll first consider what the graphics will look like and how we will execute them.

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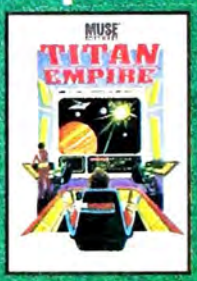
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The Big, Colorful Alphabet Code. First we need to decide on the size of the character grid. Normal text characters, if you look at them closely, turn out to be on a seven-by-eight grid of dots. The actual characters (upper case only) are five by seven, so there is one row of unused dots between lines and two columns of unused dots between letters. We can go a little smaller than that. Let's use five-by-six letters in a six-by-seven grid, so we'll have one blank row between lines and one blank column between letters. Figure 1 shows the alphabet we'll use.

We'll draw the letters with the tools we have at hand: horizontal lines, vertical lines, and dots. In order to use as few commands as possible to construct each letter (thus making the program smaller and faster), we'll use lines wherever possible.

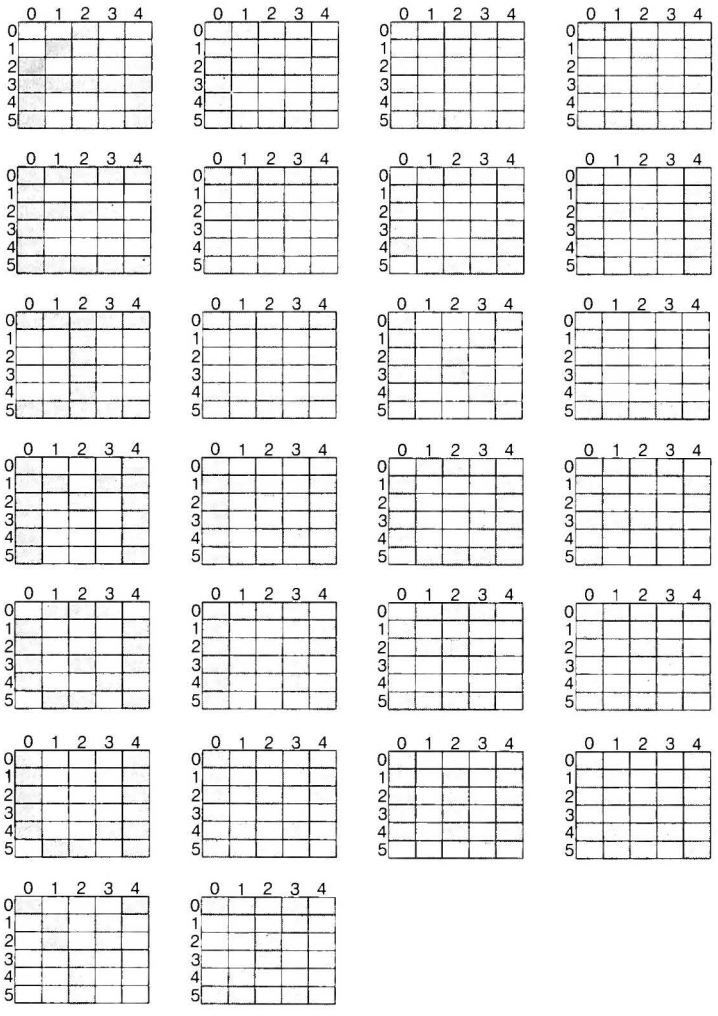


Figure 1.

There are many ways we could program this. We could, for instance, write a separate routine for each of the twenty-six letters. Bad idea. That would make the program terribly difficult to expand or change. It's better just to write one routine and twenty-six sets of data for the routine to use. That means we have to create a code—a way to structure the data for the routine.

Some letters will be all lines, some will require points, some will have more horizontal lines than vertical, and vice versa. Some letters will require more commands than others. To account for all cases, we have to include in our code the commands to use and the data to use with them. The commands will be plot, hlin, vlin, and end. Plot will take two arguments (plot X,Y), hlin and vlin will take three arguments each (vlin Y1,Y2 at X), and end will require no data. Since the numbers from 0 through 5 will be needed for coordinates, we'll use 6 through 9 for the four commands. Figure 2 shows the data necessary to create a letter *A* and how it was created.

Applying this method to the entire alphabet, we get this as our data:

```
5000 DATA A,8,2,5,0,8,2,5,4,6,1,1,6,2,0,6,3,1,7,1,3,3,9
5010 DATA B,8,0,5,0,7,1,3,0,7,1,3,2,7,1,3,5,6,4,1,8,3,4, 4,9
5020 DATA C,6,4,1,7,1,3,0,8,1,4,0,7,1,3,5,6,4,4,9
5030 DATA D,8,0,5,0,7,1,3,0,7,1,3,5,8,1,4,4,9
5040 DATA E,8,0,5,0,7,1,4,0,7,1,3,2,7,1,4,5,9
5050 DATA F,8,0,5,0,7,1,4,0,7,1,3,2,9
5060 DATA G,7,1,3,0,7,1,4,5,7,3,4,3,8,1,4,0.6,4,1,6,4,4,9
5070 DATA H,8,0,5,0,8,0,5,4,7,1,3,2,9
5080 DATA I,7,0,4,0,7,0,4,5,8,1,4,2,9
5090 DATA J,8,0,4,4,7,1,3,5,6,0,4,9
5100 DATA K,8,0,5,0,7,1,2,3,6,4,0,6,3,1,6,2,2,6,3,4,6,4, 5,9
5110 DATA L,8,0,5,0,7,0,4,5,9
5120 DATA M,8,0,5,0,8,0,5,4,6,1,1,6,2,2,6,3,1,9
5130 DATA N,8,0,5,0,8,0,5,4,8,2,3,2,6,1,1,6,3,4,9
5140 DATA O,8,1,4,0,8,1,4,4,7,1,3,0,7,1,3,5,9
5150 DATA P,8,0,5,0,7,1,3,0,8,1,2,4,7,1,3,3,9
5160 DATA Q,8,1,4,0,8,1,3,4,7,1,3,0,7,1,2,5,6,2,3,6,3,4, 6,4,5,9
5170 DATA R,8,0,5,0,7,1,3,0,8,1,2,4,7,1,3,3,6,3,4,6,4,5,9
5180 DATA S,7,1,4,0,6,0,1,7,1,3,2,8,3,4,4,7,0,3,5,9
5190 DATA T,7,0,4,0,8,1,5,2,9
5200 DATA U,8,0,4,0,7,1,2,5,6,3,4,8,0,5,4,9
5210 DATA V,8,0,3,0,6,1,4,6,2,5,6,3,4,8,0,3,4,9
5220 DATA W,8,0,4,0,6,1,5,8,1,4,2,6,3,5,8,0,4,4,9
5230 DATA X,6,0,0,8,1,2,1,6,2,3,6,3,4,6,4,5,6,4,0,8,1,2, 3,6,1,4,6,0,5,9
5240 DATA Y,6,0,0,8,1,2,1,6,4,0,8,1,2,3,8,3,5,2,9
5250 DATA Z,7,0,4,0,6,3,1,8,2,3,2,6,1,4,7,0,4,5,9
```

Data statements must be read from beginning to end, but we will need to be able to get at this data through random access. That means we should be able to get directly to the data for the letter X when we need it and not have to go through the data from A through W first. To do this, we'll have to transfer the data to an array.

```
10 GR
20 REM INITIALIZE ALPHABET TABLE
```

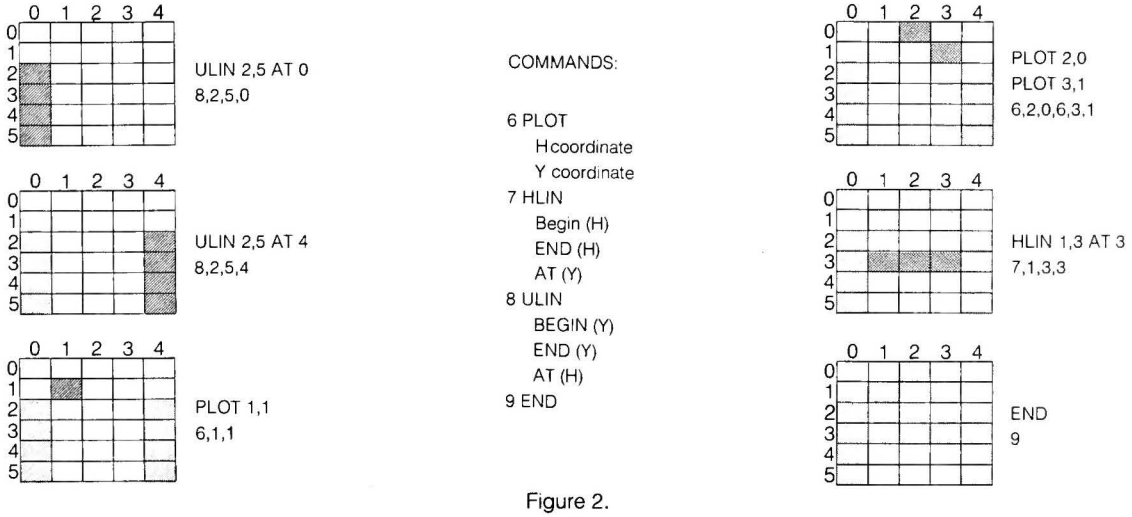


Figure 2.

```
30 DIM L%(26,30)
40 FOR L = 1 TO 26
50 READ L$
60 D = 1
70 READ L%(L,D)
80 F L%(L,D) = 9 THEN 100
90 D = D + 1: GOTO 70
100 NEXT L
```

Line 30 of the initializing procedure dimensions the array variable L%. The percent sign means that the array is composed of integer variables, which take up less space in memory than regular numeric variables. The two numbers in parentheses indicate that L% will be a two-dimensional array. The two dimensions work a lot like X and Y coordinates for getting to specific pieces of data instead of specific locations on the lo-res screen. The first dimension is 26—one "row" of data for each letter of the alphabet. The second dimension is 30 because the most complicated letter requires thirty pieces of data. Some of the space reserved for data by this statement will be wasted, but we're not approaching memory limitations yet.

Lines 40 through 100 create a double loop to read the data. The outer loop uses a for-next syntax. The inner loop, which always begins with the index variable D set to 1 (line 60) but ends whenever the data element 9 (the command for end) is encountered, is constructed with a goto, an incrementing index variable, and an if-then test. Notice that the first piece of data for each letter, the letter itself, is merely read and ignored. It was put into the data statements for the programmer's reference rather than the computer's.

Next we'll write the subroutine that uses the data to draw a letter. This routine needs four pieces of data to work, and it expects the main program to provide them. The data it needs are the coordinates to plot the letter, which letter to plot, and what color to plot it in. It expects these in the variables XP, YP, C, and L$ respectively. Here's the routine:

```
4000 REM PLOT A LETTER
4010 REM AT XP,UP IN COLOR C
4020 COLOR= C:D = 1:L1 = ASC (L$) - 64
4030 CD = L%(L1,D)
4040 IF CD = 6 THEN PLOT XP + L%(L1,D + 1),YP + L%(L1,D +
     2):D = D + 3: GOTO 4030
4050 IF CD = 7 THEN HLIN XP + L%(L1,D + 1),XP + L%(L1,D + 2)
     AT YP + L%(L1,D + 3):D = D + 4: GOTO 4030
4060 IF CD = 8 THEN VLIN YP + L%(L1,D + 1),YP + L%(L1,D +
     2) AT XP + L%(L1,D + 3):D = D + 4: GOTO 4030
4070 IF CD = 9 THEN RETURN
4080 PRINT "Bad data for ";L$;: STOP
```

In this routine, L1, derived from the ASCII value of L$, serves as the first index to the data. The second index is the variable D again. Line 4020 sets D to 1, thus pointing to the first command for that letter. The lines from 4040 through 4070 execute the command selected, read the appropriate data, and update the data pointer (D) to where the next command should be. Note that if the data is bad and an invalid command is found where a command should be, line 4080 will stop the program.

Finally, here's a short segment of code to test the routine and the data. It should plot all the letters. If any of them are bad, look for the bad data using the letter at the beginning of each data line.

```
110 FOR L = 0 TO 25
120 L$ = CHR$ (L + 65):C = INT ( RND (1) * 15) + 1
130 YP = INT (L / 6):XP = L - (YP * 6):YP = YP * 7:XP = XP * 6
140 GOSUB 4000
150 NEXT L
160 END
```

Now here's something interesting to do with the routine. Begin by saving the program as it is under the name *Banner.test*. Then delete lines 110 through 160, the testing routines. What you have left is the necessary basis for any program you might write that uses this routine, including the one we'll do here.

The program is one that will allow you to type these large, lo-res letters directly on the screen. Through the use of an escape mode, we'll be able to move the cursor to any desired location, change the color, or quit. Here's the code that prompts the escape mode commands. The prompts will fit neatly in the four lines of text at the bottom of the screen:

```
110 PRINT "              I                E"
120 PRINT "ESCAPE J  K Dot move S  D Character move"
130 PRINT "              M                X"
140 PRINT " Q Quit                              C Color: 1";
150 C = 1:XP = 0:YP = 0
```

Make sure that the characters line up as shown in the listing, and make sure the string in line 140 is exactly thirty-seven characters long. This will be important later. Line 150 sets the variables for the color and initial cursor position.

The next section creates a blinking lo-res cursor and waits for input from the keyboard:

```
160 CC = SCRN( XP,YP)
170 L = PEEK ( - 16384): IF L < 128 THEN COLOR= 5: PLOT
    XP,YP: COLOR= CC: PLOT XP,YP: GOTO 170
180 POKE - 16368,0:L = L - 128
```

Line 160 reads the current color from the screen location where the cursor will be. Line 170 loops back upon itself until a key is pressed. The mechanics of how it works are a little complicated to explain right now; we'll leave it for a time when the mood is right. The *color = 5: plot XP,YP: color = CC: plot XP,YP* sequence in that line plots a cursor in color 5, then plots over it the color that was there before. By doing this in a loop, we get a blinking cursor. Line 180 is a continuation of the mysteries of the keyboard read loop and should not be worried about.

What this loop gives the rest of the program is the variable L, which holds the ASCII value of the key that was hit. The next section acts on the value of that variable.

```
190 IF L = 27 THEN 270
200 IF L = 32 THEN COLOR= 0: FOR X = 0 TO 5: VLIN
    YP,YP + 5 AT XP + X: NEXT X: GOTO 240
210 IF L = 13 THEN XP = 0:YP = YP + 7: GOTO 250
220 IF L < 65 OR L > 90 THEN 160
230 L$ = CHR$ (L): GOSUB 4000
240 XP = XP + 6: IF XP > 34 THEN XP = 0:YP = YP + 7
250 IF YP > 34 THEN YP = 0
260 GOTO 160
```

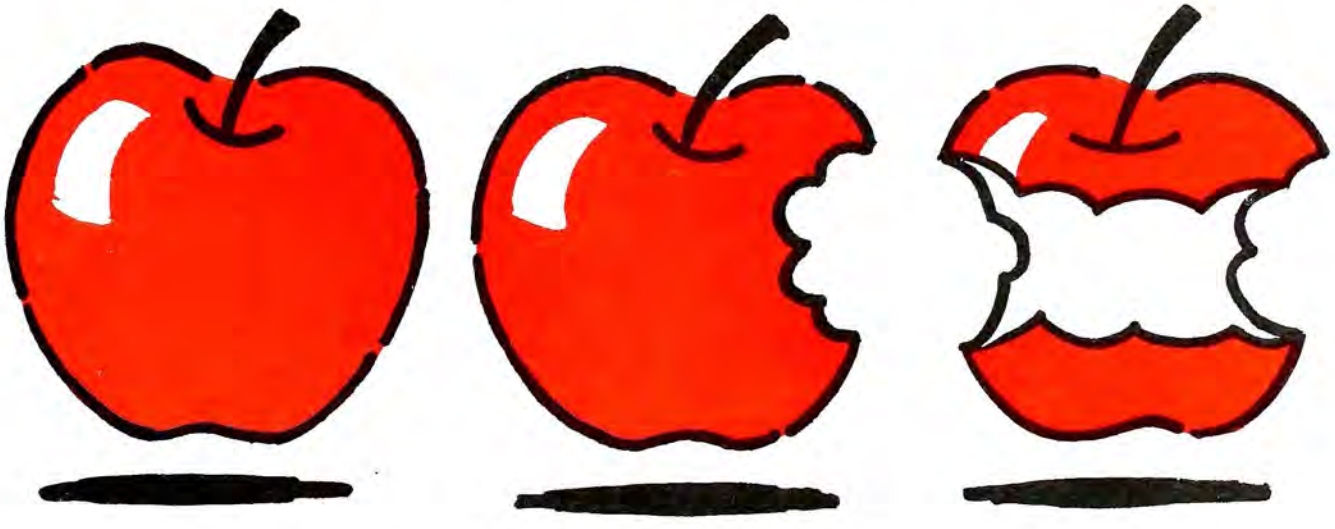
Lines 190 through 210 react to special cases—escape, space, and return respectively. Hitting the escape key sends the program to the escape mode routine beginning at line 270. Hitting the space bar clears a black rectangle the size of one character space and moves the cursor to the next position. Hitting the return key moves the cursor to the beginning of the next line. Note that if the X coordinate will cause a character to be plotted off the screen, the position goes to the beginning of the next line. This much simulates the behavior of the cursor on the text screen. If the Y coordinate puts the letter past the bottom of the screen, the cursor will proceed to the upper left corner of the screen.

Here's the first part of the escape-handling routine:

```
270 REM ESCAPE MODE
280 CC = SCRN( XP,YP):CB = SCRN( XP + 4,YP + 5)
290 L = PEEK ( - 16384): IF L < 128 THEN COLOR= 15: PLOT
    XP,YP: PLOT XP + 4,YP + 5: COLOR= CC: PLOT XP,YP:
    COLOR= CB: PLOT XP + 4,YP + 5: GOTO 290
300 POKE - 16368,0:L = L - 128
310 IF L = 27 THEN 160
320 IF L = 81 THEN HOME : END
330 IF L = 67 THEN 470
340 IF L = 73 THEN YP = YP - 1
350 IF L = 74 THEN XP = XP - 1
360 IF L = 75 THEN XP = XP + 1
370 IF L = 77 THEN YP = YP + 1
380 IF L = 69 THEN YP = YP - 7
390 IF L = 83 THEN XP = XP - 6
400 IF L = 68 THEN XP = XP + 6
410 IF L = 88 THEN YP = YP + 7
420 IF XP < 0 THEN XP = 34
430 IF XP > 34 THEN XP = 0
440 IF YP < 0 THEN YP = 34
450 IF YP > 34 THEN YP = 0
460 GOTO 280
```

The first few lines of this program create an alternate cursor so you know what mode you're in. They use the same method as the other lo-res cursor routine. Lines 310 through 330 handle escape, which puts you

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back in letter-typing mode; Q quits the program, and C sends you to the color-changing routine. Lines 340 through 460 handle cursor movement.

Here's the color-changing routine. This is the only part of the program that uses a normal get statement for single-key input:

```
470 VTAB 24: HTAB 36: GET A$
480 D = ASC (A$)
490 IF D = 8 THEN C = C - 1: GOTO 530
500 IF D = 21 THEN C = C + 1: GOTO 530
510 IF D = 13 THEN 280
520 GOTO 470
530 IF C < 0 THEN C = 15
540 IF C > 15 THEN C = 0
550 PRINT " ";C;: IF C < 10 THEN PRINT " ";
560 GOTO 470
```

The commands *htab* and *vtab* should have been covered earlier. They will get a lot of attention later on in this series, as they're very important commands. All they do is position the text cursor, in this case causing the flashing cursor created by the get command to appear after the word *Color:* on the bottom of the screen. The legal ranges for htab and vtab are 1 through 40 and 1 through 24 respectively. Note that, unlike the ranges of graphics coordinates, these ranges do not start with 0, although they do start in the upper left corner of the screen.

This routine only responds to three different keys: left arrow, right arrow, and return. Return goes back to escape mode. The arrows increment and decrement the value of the color variable, C. The value of C wraps around; if it goes out of the 0 through 15 range, it "reappears on the other side." Finally, the new value is printed.

A New Approach. This month's column signals a new way of presenting programs in *Follow the Floating Point*. With a large program like this one, it doesn't make sense to walk through line by line. We should be beyond needing every statement and condition explained and be able to move on to larger programs. We'll go into detail about important new commands and algorithms, but we'll try to look as much now at the forest as we have looked up until now at the trees. ◨

GLOSSARY

Cartesian coordinates: A two-dimensional coordinate system in which the coordinates of a point are its distances from two intersecting, often perpendicular, straight lines (*American Heritage Dictionary*).

COLOR: The command to set the color for lo-res plot, hlin, and vlin commands.

GR: The command to turn on lo-res graphics mode with four lines of text at the bottom of the screen.

Hi-res graphics: A graphics mode that has a resolution of 280 by 192 in six colors.

HLIN: Lo-res command to draw a horizontal line.

HTAB: Text command to place the horizontal position of the cursor.

Integer variable: A variable that can hold an integer between −32,767 and 32,768. It is identified by a percent after the variable name.

Lo-res graphics: A graphics mode that has a resolution of 40 by 48 in sixteen colors.

PLOT: Lo-res command to plot a point.

Resolution: The number of discernible points in a graphics screen, or how closely packed those points are. High resolution has many small points while low resolution has fewer large points.

SCRN (*X,Y*): Function to read the color value at a specified point on the lo-res screen.

TEXT: Command to switch to text mode.

Two-dimensional array: A variable array with two dimensions, requiring two indexes to gain access to a particular data element in the array.

VLIN: Lo-res command to draw a vertical line.

VTAB: Text command to place the vertical position of the cursor.

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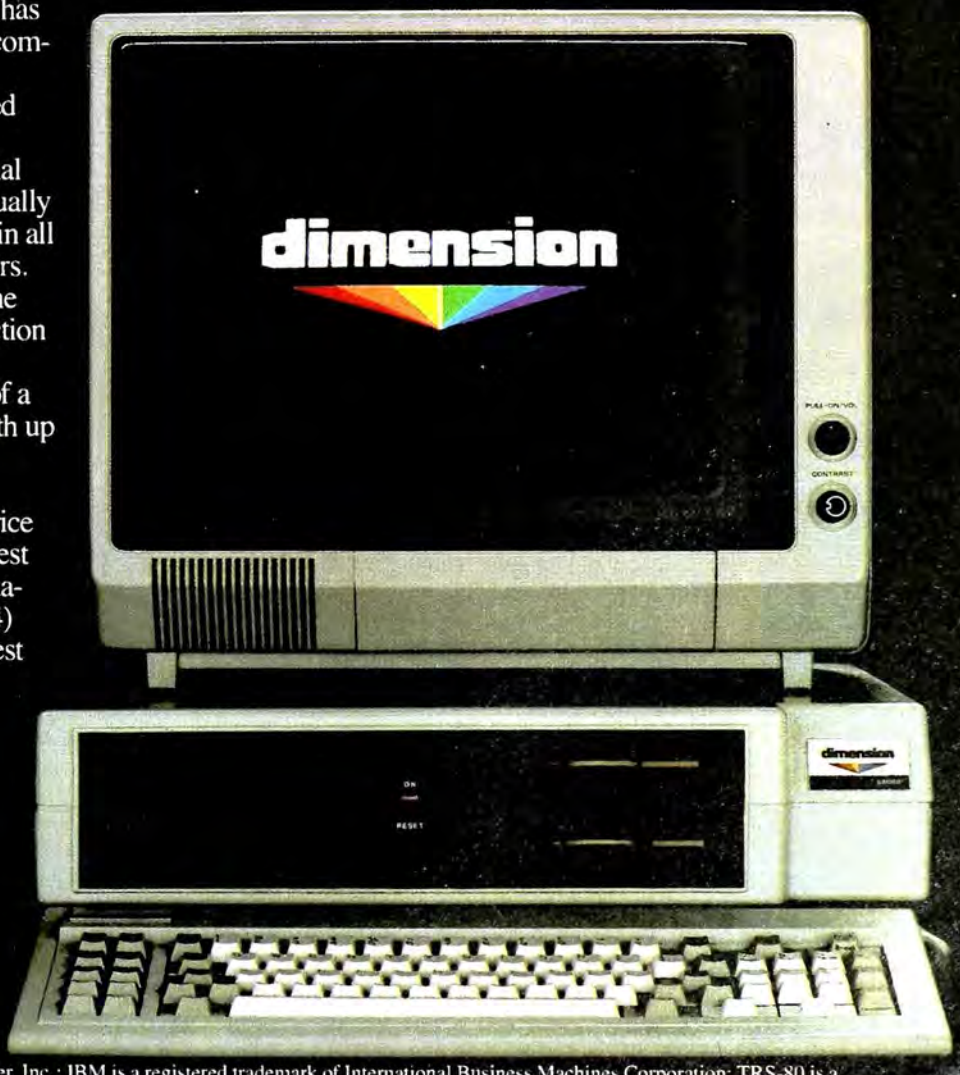
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Sherlock Holmes and the Analytical Engine

BY BRUNO B. WOLFF JR.

Some few of you may know that I have uncovered some previous works of Mycroft Holmes relating hitherto unknown adventures of his illustrious brother, the great detective. Dr. Watson mentioned Mycroft in the "Bruce-Partington Plans" and the "Greek Interpreter." But several years ago, while studying in England doing research in the War Office, I uncovered, in a dark corner of a storeroom of unclassified documents, a packet of papers with the inscription "Sherlock's" on it and the initials "MH" scrawled in a broad, careless hand.

Only my closest friends have had the chance to share such adventures as "The Malevolent Leprechaun," "The Neopolitan Plate," and "The Secret Agent"—three of Sherlock Holmes's cases that Mycroft related in those papers. This adventure I share with my readers because it throws light on what may be a missing link in the development of the computer as we know it today.

But let me not get ahead of the tale as Mycroft wrote it circa 1896.

—B.B. Wolff, Jr.

War clouds were looming across Europe, even if the general public was not aware of it. With the demise of Bismarck, Kaiser Wilhelm II was pursuing an aggressive policy in Europe and Africa. Espionage was being honed to a fine edge by both us and the Germans. I knew this, dear reader, from my position with Her Majesty's government. It was one of my tasks to ferret through all the countless reports of our spies, endless reams of diplomatic correspondence, and, where we could decipher them, intercepted coded messages of the German government or its allies and agents. Then I would ascribe some meaning to events and present my findings to the Prime Minister.

But even though Dr. Watson alluded to my coordinative and synthetic prowess, I was finding the amount of data coming in to be too much even for me. I do admit to being human, though I don't ever remember admitting thus to Sherlock, who probably wouldn't have believed me at any rate. So I found myself staring at a large stack of documents my clerk had just laid in front of me—right next to yesterday's stack, which was, in turn, piled next to that of the day before. While I was told that work in the diplomatic corps could be hazardous, as I found out in "The Malevolent Leprechaun," I never thought of death by drowning in a sea of paper as one of those perils.

Yet here I faced mounting wave on wave. While I turned over what had gone through my brain of three days past, I heard a knock on my door. To most people a knock on the door is a familiar event, but for me it was a rare circumstance. I received the deluge of documents from my clerk each morning and afternoon, and I dispatched my synthesis of the data in a special pouch the first thing each morning. Every Monday I met with the Prime Minister and his cabinet to answer questions and to elaborate on what I suspected or predicted in my synthesis. This routine was only rarely disturbed, and in those cases there was an extraordinary crisis brewing.

I squirmed in my chair and called out, "Yes. Come in, will you." In the frame of the door stood my long-time colleague, Sir Geoffrey Wren. He was a man of considerable size and ruddy complexion. He had been with Her Majesty's forces in Afghanistan twenty years ago, was wounded twice, and was awarded the Victoria Cross, presented by none other than the Queen herself. He now headed up the intelligence section of the War Office with the rank of general.

None of us wore uniforms as such, though Wren's tweed was his customary suit. He took his pipe from between his lips and, shutting the door, spoke.

"Mycroft, pardon my intrusion on your reverie, but I really am damn well concerned about your last report. Unless I read you altogether wrong, you implied in yesterday's report that Germany was brewing up a volatile kettle in Africa to throw fuel on the Boer crisis. Now I know you are not getting all the data you need to put this matter together more solidly. Not so?"

"Yes, Geoffrey, I need a great deal more analysis to put all the pieces together.

"And what about the code, the blasted German code. We have all the pieces but we can't make out the puzzle. We know they funnel their plans from Nairobi, up the Nile to Khartoum, and then to Cairo across the Mediterranean to the Balkans. We can get at them anywhere in Africa with our contacts in Nairobi or Cairo. But the blasted code has us stumped.

"I need one thing to help me get at this; not even a thousand more hands will help; I need another synthesizer—another brain like mine to fit together all these diverse bits and put them into a meaningful picture."

"Where on Earth, much less on this isle, this England, shall we find such a one? Where is another Mycroft Holmes?" asked Sir Geoffrey.

"Elementary, my dear Wren. My brother may be of some help."

"Sherlock Holmes! I respect your brother's ability as a criminologist, but what does he know of international politics?"

"The only difference between my mind and Sherlock's is the

end of our endeavors, not the means or method. He puts together from diverse evidence a synthesis, the science of deduction, Geoffrey, in the same way I deduce the next move of Germany from the particles of evidence I see in these documents."

I waved my hand across the sea of papers, perhaps like Moses to part the waters. Sir Geoffrey Wren put his pipe back between his teeth and sucked it futilely.

"I think I understand."

"Sherlock gets his data by prowling around with a glass or questioning goose merchants or stalking along dark alleys and in opium dens. My data are handed to me neatly copied by my clerk or clipped from newspapers."

"Even if your brother could help us, how do we know he would be available? And what of the code? What does he know of encryption?"

"The thought of leaving here, of neglecting these," I said, pointing at the Red Sea, "is too enervating, too immobilizing for words, Geoffrey. But I'll send my clerk around to him with my card to find out if he'll be in; he's likely to be in Devon chasing large dogs across the Grimpen moor."

Some hours later my clerk reported back with a handwritten note: "Always in to you, old boy. Be at Baker Street for tea."

When I arrived at 221B, Sherlock was sitting at his table, a resplendent tea service set out before him and various sweets prepared no doubt by Mrs. Hudson, who had shown me up and was still standing by the door. "Thank you, Mrs. Hudson, I shall enjoy partaking of your crumpets. If they taste as good as they look I shall be putting on a few more unneeded pounds."

"Oh, Mr. Mycroft, it's always such an event when you come to call. If you want more, just ring."

"Mycroft, how nice to see you. What draws you to Baker Street? More than Mrs. Hudson's biscuits, I'll wager."

"A matter of some moment—a quest, if you will, for a doubling of my brain."

"Please sit here," Sherlock said, brushing off a chair for me as if it had been polluted by one of his experiments. He poured my cup. "This service may be new to you, Mycroft, a gift from the Imam of Ranjier for a service I rendered him last year." He sat across from me and took his cup delicately in his graceful hand and peered at me. "Come, come, Mycroft, pleasantries were never our métier. Out with it. How shall we duplicate your brain?"

"That, my dear brother, is precisely my question of you." I went on to explain my onerous workload and the need not only to speed my comprehension of the volumes of data but to unravel the German code as well.

"So you need a way to sift and winnow the masses of data you have to look at, to catalog it, to compare and relate it, and to infer from that some conclusion or prediction of future events. That is point one, isn't that so, Mycroft?"

"Just so."

"And the second thing you need to do is assist in decryption of code by a reiterative processor that can make many trials and comparisons of code and probable messages or already broken fragments. That is point two, is it not?"

"Just so again, brother."

Sherlock reached for his sock of tobacco and knocked the ashes from his cold pipe, which lay against an empty glass humidor. Filling the pipe absently, his eyes rolling toward the ceiling, he lit the tobacco and puffed smoke in rings toward a spot on the ceiling. I looked up too, hoping to see a sign like Constantine in the heavens. But all that was there was a musty plaster, encrusted with too many of Sherlock's foul concoctions.

His eyes came back down and he smiled as he said, "Have a biscuit, Mycroft; Mrs. Hudson will be sorely disappointed if you leave a crumb."

As I munched on Mrs. Hudson's morsels, I watched Sherlock go to a large cabinet full of papers in seeming disarray. "You see, Mycroft, there is order in all this," he said, waving a sheaf of papers at me. "Here are the Babbage papers."

"Do you mean the late inventor and mathematician?"

"None other, Mycroft. Here, read this tonight. In the meanwhile I'll summarize it. Mr. Babbage invented a machine to do repetitive calculations of complex formulas at astounding speeds."

I turned the papers over and noted they constituted a piece published by the Royal Society and written by Charles Babbage nearly forty years ago.

"The story is he never finished the machine; he called it his Analytical Engine. The problem as I understand it was that he could not get the financing to finish its construction—a highly expensive endeavor involving the hand cutting of many intricate gears and cogs."

"Yes, Sherlock, I remember looking into this for the government a few years ago; but without Babbage to guide the project, we felt it couldn't be done."

"Now here's another for you, Mycroft: A Mr. Hollerith in the States has used sets of punched cards to do their census. He uses them to sort out and count people. Now with a little ingenuity I should think you could catalog and cross-refer your documents using Hollerith's technique. By judicious cross-referencing you'll be able to retrieve connected pieces of information and do it quickly."

"By Jove, Sherlock, I think you've hit upon it. That solves one of my two problems, but what about the German code? Prime Minister Jameson of South Africa maintains the Germans in West Africa and in East Africa are trying to cause further trouble in Transvaal and break the uneasy truce there between us and the Boers. There's nothing the Kaiser would like better than to send us running all over South Africa while he moved up the Nile and 'liberated' the Sudan."

"Yes, I can imagine the skullduggery that's being perpetrated there in the name of diplomacy. But here is where I think our friend Charles Babbage may serve his country posthumously. I think his Analytical Engine was preceded by another machine called the Difference Engine, less flexible than the Analytical Engine but still very fast in computation. We need to get the machine from the British Museum for a while with permission to make a few adjustments. Can you arrange this?"

"We may have to go through Salisbury, but I think it could be arranged. Do you want it delivered here?"

Just then we were interrupted by a knock on the door. "That's Watson, Mycroft. I'm convinced he'll prove to be invaluable in this enterprise; may I take him into our confidence?"

"Sherlock, your judgment is impeccable."

Sherlock let in Watson, who had that merry wink in his eye that said he felt he was in on something or felt a case coming for his old friend. "I knocked because Mrs. Hudson said you had an important visitor, and I didn't want to barge in."

"Nonsense," said Sherlock, "you know you are my good right arm, Watson."

"Ah, Mycroft, how nice to see you again; your comings are too far apart."

I arose from my chair and shook his hand warmly. "Always nice to see you, Doctor."

"Well, I see you have tea, humph."

"Please, Watson, sit down and take tea and listen to a proposition I will put before you to help Mycroft on a problem he faces. We need to use your skillful hands in designing and building some gears and cams to drive an engine."

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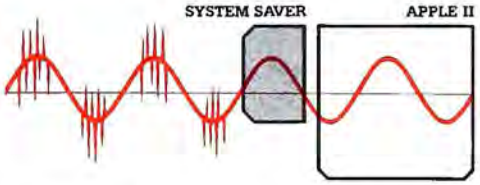
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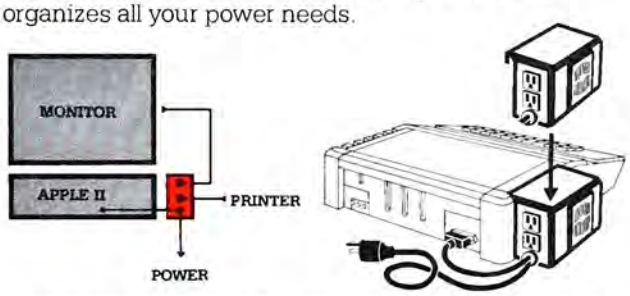
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"What's that? I haven't done that kind of thing for fifteen years."

"It will come back to you, Watson; it will assuredly come back to you. You see, Mycroft, I think the Difference Engine with a few changes can be made to do repetitive tasks needed to break the German code."

"I say, Holmes, is this similar to the code you deciphered in 'The Case of the Dancing Men'?"

"No, no, Watson, I'm afraid this one is devilishly more clever. That one was a simple substitution code using one figure to mean one letter. This one, I would guess, is a multiple offset substitution code."

Watson gaped at this.

"Say we substitute the number 1 for the letter A, 2 for B, and so forth till 26 for Z. Now say we change the offset so that 7 is for A, and 8 for B and so on with 6 for Z. Or we can use letter substitutes, letting, say, F stand for A, G for B and so on until E stands for Z. A coder-decoder can be made very simply by putting two concentric circles, one inside the other, each with the twenty-six letters of the alphabet around it. Now we can set the offset by turning one circle so that the A in the inner circle lines up with a letter in the outer circle. So we could line up A with F. Now we can easily code a message by using the outer ring as the clear message and the corresponding letter on the inner ring as the cipher."

"But, Holmes, that's really nothing more than the problem you said was so easy in the 'Dancing Men.' "

"Quite so and very observant, Watson, but if I am correct and the Germans are using such a code, they will vary the offset on each letter according to a preset pattern using a number sequence from 0 to 25. The key to the code is the number sequence, and finding it and testing the results is the job for the Difference Engine."

"Sherlock, what makes you think the Germans would use such a code? There are many others even harder to decipher."

"Two reasons, Mycroft. One, the logistics, the length of the German communication. They must keep it simple so they can easily change it. And two, they are dealing with a variety of agents, many of whom don't even know the German alphabet, much less the German language. Now, Mycroft, can you get us that machine?"

"I'll leave at once to arrange for delivery tomorrow."

The delivery men came the next day and set the ponderous object upon the floor. I watched my brother's eyes take in the machine and pour over it gear by gear. His disheveled look told me he had spent most of the night reading Babbage's accounts of how the machine worked.

Watson asked, "You said they needed a sequence of numbers; how does that work?"

"In two ways; they can either have a book with a long list of numbers, or they can work with a seed number that is acted upon in some way to produce a second number that becomes the seed for the next number. Once you know the seed and the formula, you can derive the offset numbers from the sequence. Depending on how many letters are in the alphabet being used, a number greater than the total number of letters would be converted to a number less than the sequence by dividing the number by the sequence and taking pi, which I'm sure you remember is an endless number that begins 3.141592653589793238462. There are two ways to approach this if this is a key. We could break the number into pairs and compute modulus 26. First the pairs would be 31 41 59 26 53 58 97 93 23 84 62. The remainders would be 5, 16, 7, 0, 1, 6, 19, 15, 23, 6, 10. Now say we wanted to encode the phrase HELLO WATSON. Using our wheel, we would get MUSLP CTIPUX."

"We have our work cut out for us, Holmes, if we mean to break such a complicated code."

I will not detail the endless hours that went into the next three weeks while Sherlock figured and Watson cut gears. The machine cranked away and spewed out a seemingly endless series of numbers. Sherlock, with his unusual ability to concentrate on a problem with complete intensity and abandonment for long periods of time, was remarkable. I've never seen it in another man—not Gladstone, nor Chamberlain, nor Balfour, none.

In the third week, one dreary afternoon with the fog thick around the ministry, I was again disturbed by a knock at my door. This time it was Sherlock, with a grin that assured me the cat was in the bag.

"Here it is, Mycroft; I thought I'd deliver it myself. We found the key; they used a simple center squaring technique, with the Kaiser's birthday as the initial seed. I'd keep the engine running, though, because they may change the key in the future, but I'll show some of your people how to run the blasted thing so I can get down to Surrey for a rest. By the by, Mycroft, can you arrange to let me see the Analytical Engine? Even if it wasn't finished, I think it has some promise in criminology. I have an idea that you could produce the same results more efficiently using electrical relays—like the telephone, what? It has some future to it, I'll wager."

I shook my head. "Yes, it may indeed."

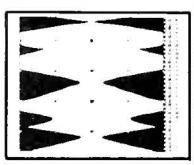
"Can't you visualize a dossier on every criminal in England on Hollerith's cards fed into the Engine and compared to a recent crime? Or picture an analysis of crimes across the city to find a pattern, perhaps even to predict where a crime might occur?"

"Yes, Sherlock, I can see a world of uses for such a machine—a thousand different outcomes for it to compute."

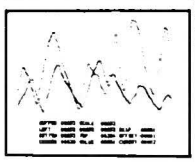
"Yes, Mycroft, a computer, indeed." ■

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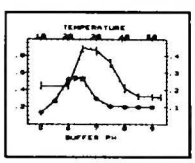


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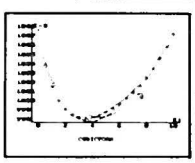


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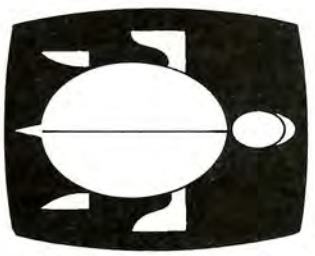
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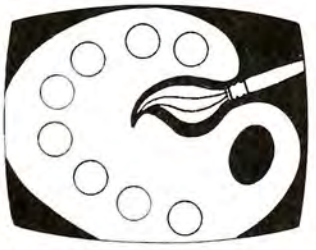


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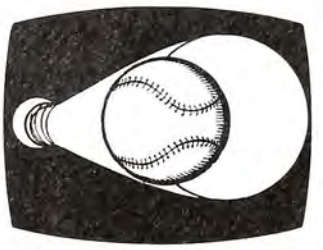
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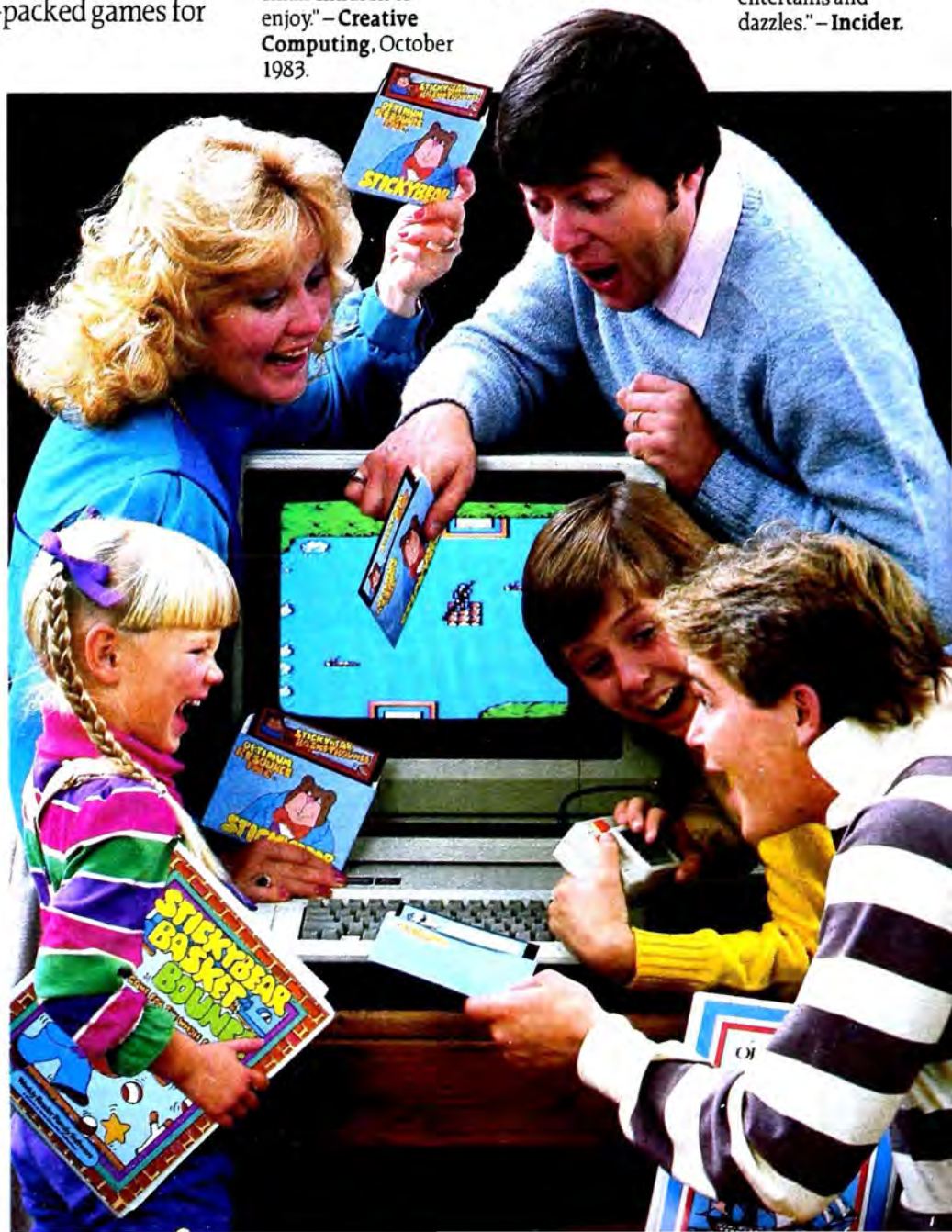
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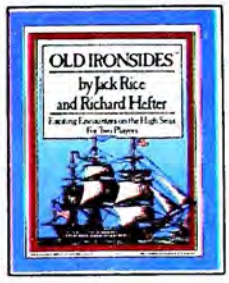


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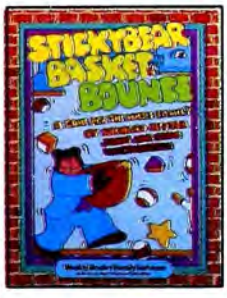






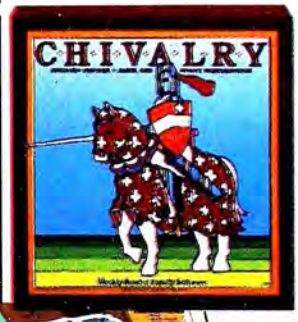


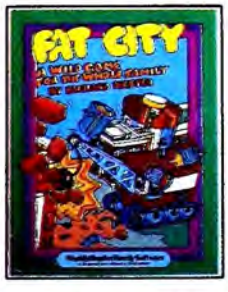
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The Schoolhouse Apple

by Carol Ray

Breaking the Silence

The first few years of life are never easy. Faced with an overwhelming amount of sensations and impressions, it's a wonder that very young children ever make sense of it all. And yet they do. Helped along by parents, siblings, and various other caretakers, they gradually learn to recognize bits and pieces of human speech that are somehow associated with events and objects in the real world. Thus the notion of meaning is born.

Unfortunately, it doesn't always happen this way. Children afflicted with handicaps such as cerebral palsy, mental retardation (including Down's syndrome), blindness, and emotional problems have great difficulty controlling their attempts at talking and writing. Many are painfully aware of their own shortcomings and have resigned themselves to failure. To prevent such a breakdown in the normal development of language, some form of early intervention is required between these children and the outside world. Dr. Laura Meyers and her colleagues in the field of child language development believe that they have discovered a useful intermediary in the form of the microcomputer.

PEAL to the Rescue. Beyond what even the most skilled and understanding teacher can do, the computer offers handicapped children, such as those at the Exceptional Children's Foundation in Los Angeles, a "language prosthesis . . . facilitating their immediate participation in meaningful oral and written language." Even children who are unable to control body movements, or who show little or no interest in their surroundings, can be helped by means of such features as synthesized speech and a specially designed membrane keyboard showing pictures, symbols, and words. Indeed, these are the primary components in the system designed by Meyers and developed by programmers Anthony Villano and Jim Day. It is called Programs for Early Acquisition of Language (PEAL) and consists of a touch-sensitive board connected to an Apple II computer and an Echo II speech synthesizer.

In order to accommodate children at different levels of accomplishment, the software provides several degrees of complexity within a specific play activity. The activities themselves are based on those found in the spontaneous play of children at many different stages of development. They range from examining the contents of a purse to more sophisticated games using dolls, toy cars, and so on. As Meyers points out, "For each word that is demonstrated on the computer it is always necessary to have within the child's glance, and preferably within his reach, an object or picture with which the word can be associated. The computer then reinforces the language learning—pairing sound (voice synthesis) with meaning."

The PEAL system offers a synthesized vocabulary, color graphics, and a keyboard overlay corresponding to a variety of play activities. As play becomes more complex, more choices appear on the board, and single-word utterances give way to two-word combinations, and then to multiword statements.

And the results?

In many cases the computer succeeded where more conventional techniques have failed. Play sessions involving children talking to other children with the aid of voice synthesizers frequently outlasted those where no communication devices were present. Children who hesitated to imitate a speech therapist eagerly imitated a speech synthesizer that they controlled. Nor was there confusion as to when to use synthesized speech versus oral speech; both were used appropriately in context.

Reading and Writing and. . . . It wasn't long before the children using "talking" computers began to ask about the printed text on the membrane board and the monitor screen. Some suffered from physical handicaps that made it difficult for them to use a pencil and paper. Others were victims of teaching methods that put more emphasis on correctness than meaning.

As an aid to those who were making their first attempts at reading and writing, Meyers introduced the children to *Keytalk*, a program that can be accessed either through the standard Apple keyboard or through the membrane keyboard covered with an overlay resembling the standard keyboard. The program uses synthesized speech to "say" each letter as it is typed in. Hitting the space bar causes the preceding word to be spoken by the synthesizer, and an entire line is read out when the return key is pressed. Children can scan the monitor screen while hearing their work read through the speech syntheizer; the program can also produce a printout of the text.

It's not all hard work, either. Some of the preschoolers using *Keytalk* came up with the idea of inventing "garbage words"—random sequences of letters that they could instruct the speech synthesizer to pronounce. Wanting to hear a favorite word, a child had to remember how it was spelled in order to get the computer to say it. These kids may think they're just having fun, but at the same time they're getting a valuable lesson in sound-symbol correspondence.

With the help of Dr. Teresa Rosegrant, a specialist in linguistics and early childhood education, Meyers has also developed a program that lets children perform various editing tasks and that gives them the option of saving their work on floppy disks. It's called the *Talking Screen Textwriter Program* (*TSTP*). The program has been shown to be a powerful tool for improving the reading and writing skills of older handicapped children, as well as those of nonhandicapped preschoolers. For the visually impaired it provides a way of "reading" what's on the screen by supplying a synthesized-speech version of the text. The versatility of this feature is what makes the program valuable to those whose reading skills are underdeveloped; students are free to use the synthesizer only for words that they can't figure out by themselves.

Perhaps more than any other, it's this feature of user control that distinguishes the programs mentioned. Because "nothing happens unless the child does something," it's more likely that children will view the computer as a helper, a tool with which it is possible to make themselves heard and understood—maybe for the first time.

Of course, the progress reported here in helping children compensate for physical and emotional handicaps must be kept in perspective. Even the few lucky ones who manage to become proficient on a computer are likely to have continuing difficulties with language. In addition, by basing their instructional strategies on what handicapped children are capable of, rather than on their disabilities, Meyers and Rosegrant are challenging the prevailing view among professionals that efforts to teach the handicapped should focus on those abilities that are lacking rather than those that are present.

Rather than reinforcing children's awareness of their handicaps, Meyers and Rosegrant are concerned with building up confidence and with removing fears and misconceptions about what is and isn't possible when faced with physical and emotional disabilities. They have shown that, given the right tools and guidance, even severely handicapped toddlers as young as eighteen months can become active participants in meaningful dialogues.

It's not just a question of learning or of teaching; it's a question of taking charge.

You can obtain a copy of the programs mentioned here by contacting Dr. Laura Meyers at PEAL Software, 1725 Promenade, Suite 323, Santa Monica, CA 90401.

Take the EdGame Challenge! The second Computer EdGame Challenge, sponsored by Verbatim Corporation (the floppy disk people) and administered by Scholastic (the publishers of *Electronic Learning* and *Teaching and Computers*), is now under way. Entries should consist of computer-based games of a nonviolent nature that are "both fun to play and instructive." The deadline for submitting entries is

April 30.

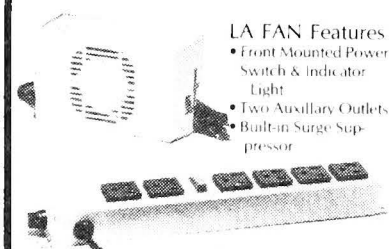
Students, teachers, and professionals are all eligible to enter the contest in either of two divisions: elementary (K–8) or secondary (9–12). Each division offers six subject areas from which to choose, and each of twelve winners will receive an Atari 800XL computer and 1050 disk drive, plus an Amdek Color-I Plus monitor. In addition, Verbatim is offering two free Datalife minidisks to each school submitting entries, and all school classes and individual entrants will receive merit certificates from the Computer EdGame Challenge in recognition of their contributions to the contest. Finally, the best overall programs will be duplicated and distributed on a nonprofit basis by Data Encore, a subsidiary of Verbatim. The authors of entries selected for duplication will receive royalties.

The same guidelines that were in effect last year hold for this year's contest—namely, that a program must offer not only an original, challenging game, but also a useful educational tool. This means incorporating successful gaming strategies into a context where high scores are the result of "actually improving a player's skills or knowledge." A program's clear instructions, appealing graphics, and ease of operation are additional factors with which entrants should concern themselves.

Entry forms can be obtained by calling the EdGame Challenge Hotline at (212) 505-3485. In addition, you'll receive complete information regarding the contest rules, eligibility requirements, and judging criteria. Some helpful tips on writing game software are also included.

All entries become the joint property of the contest organizers until April 30, 1985. ■

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The Voice of THE TURTLE

A Schoolhouse Apple Tutorial

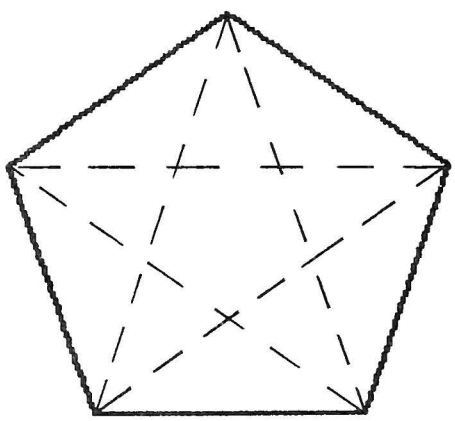
LOGO

DONNA BEARDEN

Stars and Pentagons

Sometimes it's fun to select one or two shapes and see how many designs you can make with them. Let's look at pentagons and stars. Through exploration and design, we will be able to see how closely these two figures are related (and we will create some beautiful designs in the process).

If you are working with students, one way to demonstrate how two figures are related is to have the students draw a succession of stars within pentagons within stars, and so on. Begin with a large pentagon. Using a pencil and ruler, draw the diagonals of the pentagon. The result will be a five-pointed star.



Look at the center of the star and you will see another pentagon. Draw the diagonals of this smaller pentagon to make a smaller star. Continue drawing smaller stars until they become too small to draw.

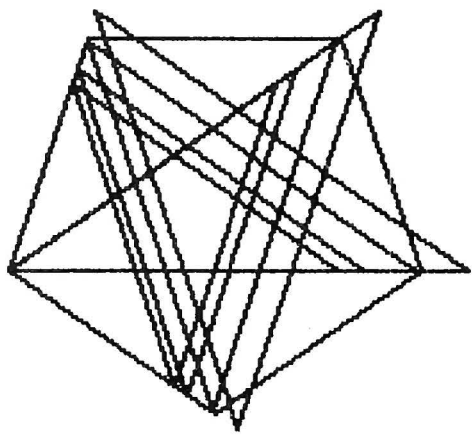
Now let's try the same exercise on the computer. Begin by defining procedures for pentagons and stars:

```
TO PENT :N
REPEAT 5 [FD :N RT 72]
END

TO STAR :N
REPEAT 5 [FD :N RT 144]
END
```

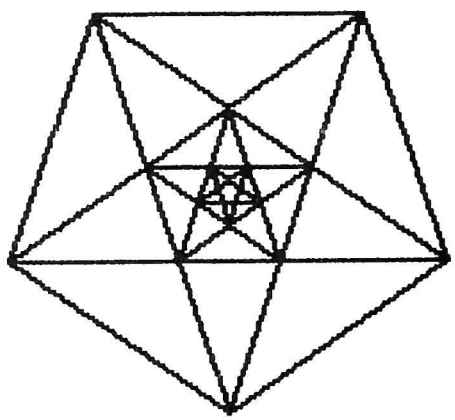
Draw the first pentagon. You might want to reposition the turtle first so you can draw a large one. How much should we rotate the turtle before we draw the star inside the pentagon? Look at the drawing of a star within a pentagon. Each point of the star divides the interior angle of the pentagon into thirds. If you know what the interior angle of the pentagon is, you should be able to figure out how much to rotate the turtle.

Now it's a matter of trial and error to find the correct size star. Try several until you find a good fit.



Add a second star and then a third. By trying various sizes of stars and different distances that the turtle must move forward to draw the stars, you'll discover that the forward distance will be the same size as the next star. In other words, if you tell the turtle to move forward 62 (and it is in the correct position), the size star you need will be STAR 62.

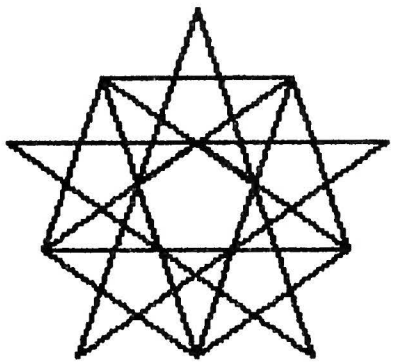
Here is a STARS.WITHIN.STARS procedure starting with a pentagon that measures 100 turtle steps on a side. Try to develop your own procedure with a different size pentagon.



```
TO STARS.WITHIN.STARS
PU SETPOS [-80 -40] RT 18 PD
PENT 100
RT 36 STAR 162
FD 62 RT 36 STAR 62
FD 23.5 RT 36 STAR 23.5
END
```

One of the most important Logo questions is "What would happen if . . . ?" So, what would happen if we started with a pentagon and drew

stars on each side? Start with any size pentagon. Next, add a star of the same size on each side. (In order to create designs that were "straight" on the screen, the turtle was rotated 18 degrees to the right before starting each design.)



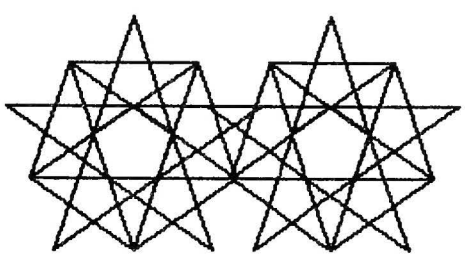
```
TO PENT.STAR
PENT 70
REPEAT 5 [STAR 70 FD 70 RT 72]
END
```

You drew one pentagon and five stars. But look what happened! You should be able to count seven pentagons and seven stars. Study the design, and you'll discover one star perfectly positioned inside the original pentagon. (And we worked so hard to do that just a minute ago. . . .)

If you can dump graphics, print out several copies of this design and color them, emphasizing different patterns.

What would happen if we positioned the turtle to draw another PENT.STAR next to the first one? Here's one way:

```
TO DOUBLE
RT 18 PENT.STAR
PU SETX -113 PD
PENT.STAR
END
```



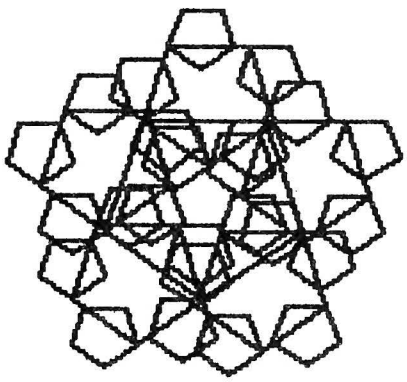
There are a lot of other things we could try with this design, but let's move on to some other star-pentagon creations.

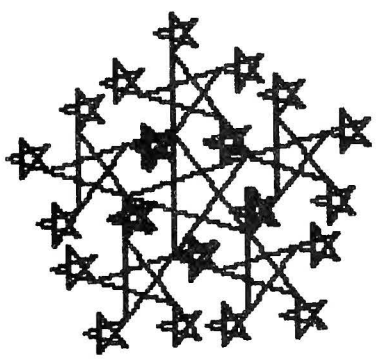
In the March issue, we explored some recursive designs. Let's see what we can do with them. The basic procedure is one that includes the recursive call within the REPEAT command. We'll define two variations of the procedure; one will result in pentagons and the other in stars.

```
TO WONDER :X
IF :X < 5 [STOP]
REPEAT 5 [FD :X WONDER :X - 15 RT 72]
END
```

```
TO WONDER1 :X
IF :X < 5 [STOP]
REPEAT 5 [FD :X WONDER1 :X - 15 RT 144]
END
```

Try various inputs with these procedures and see what happens. Here are two examples, but it's much more fun to watch them as they're being drawn.





Depending on the inputs in the first procedure, the shapes just inside the outer ring of pentagons will be more or less like stars. In the example shown, there is a star in the center. The second procedure draws stars, and they end up forming a pentagon.

Try changing the original procedures and see what happens. For example, instead of subtracting 15 in the recursive call, you could divide by 2.

Let's look at another type of design created with recursive procedures. These are beautiful string art designs created with straight lines that seem to curve.

Begin with a CURVE procedure:

```
TO CURVE :X :A
IF :A > 180 [STOP]
FD 6
LT :A FD :X BK :X RT :A
CURVE :X :A + 10
END
```

Then define a procedure to put CURVE into a pentagon and another one to put CURVE into a star:

```
TO CURVE.PENTAGON :X :A
REPEAT 5 [CURVE :X :A LT 72]
END
```




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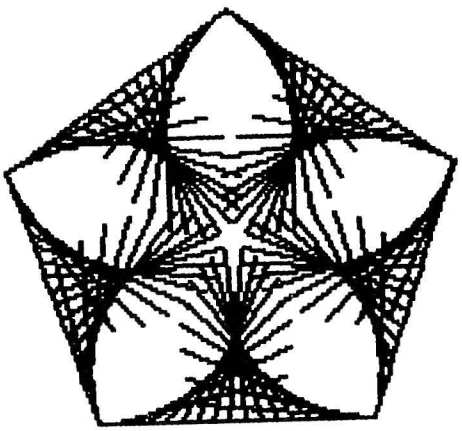
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```
TO CURVE.STAR :X :A
REPEAT 5 [CURVE :X :A LT 144]
END
```

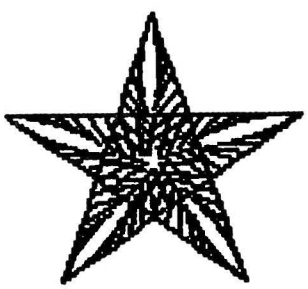
There are so many possibilities and, again, half the fun is watching the turtle as it seems to act more like a spider spinning a magnificent web.

Pay attention to the inputs you use and the patterns that evolve. Some of the CURVE.PENTAGON inputs will result in a starred center.



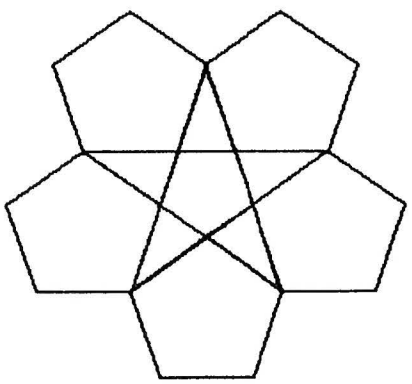
CURVE.PENTAGON 65 15

On the other hand, many of the CURVE.STAR inputs result in a MESS. Keep trying and you will find some nice ones.

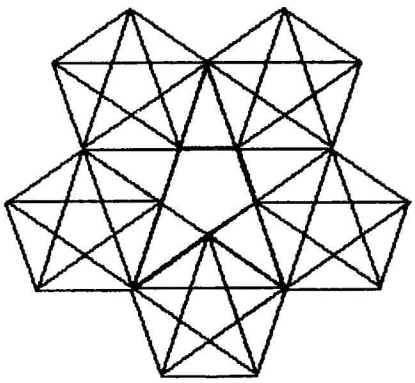


CURVE.STAR 15 5

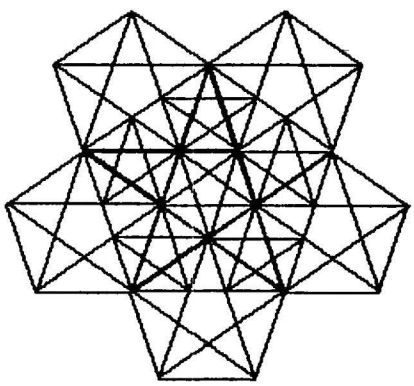
As we have worked through all these stars and pentagons, four numbers have occurred over and over. They are 18, 36, 72, and 144. (Hmm, there seems to be a pattern there.) Keeping these important numbers in mind, here's one final challenge. Draw a star. Add pentagons around the outside of the star as follows:



Add stars within each of these pentagons:



Add smaller stars within the smaller pentagons:



If you absolutely have to peek, here's one possible solution. But try it on your own first; you might come up with a better solution.

```
TO STARS
HT
DESIGN
ADD.STARS
ADD.MORE.STARS
LT 108 STAR 57
END

TO DESIGN
PU SETPOS [-30 -60] RT 18 PD STAR 150
LT 108 PENT 58
RT 108 FD 93 LT 108 PENT 58
REPEAT 3 [RT 180 FD 35 LT 108 PENT 58]
END

TO ADD.STARS
RT 36 STAR 93
RT 72 FD 57 RT 72 STAR 93
RT 72 FD 93 LT 72 STAR 93
REPEAT 2 [RT 144 FD 36 LT 72 STAR 93]
END

TO ADD.MORE.STARS
LT 72 STAR 57
REPEAT 4 [LT 36 FD 36 LT 36 STAR 57]
END
```

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BY TODD ZILBERT

WITH PHOTOGRAPHS BY LES LOVETT OF THE NATIONAL HOT ROD ASSOCIATION

Several thousand scantily clad people sitting and standing in bleachers, tall cool ones in their hands, stare with expectation at a strip of pavement bisected into two narrow lanes. Below, several people mill around, waiting, watching. You glance at your watch and then at your crew chief. She nods, solemnly. You nod, put the finishing turn on a lug nut, wipe your hands on an oily rag, and struggle into aluminized coveralls.

Your crew wheels the rod into the staging area. The noise is tremendous, but it's the heat, the heat. . . . It pulses off the blacktop in waves; you climb into the black leather seat, hoisting yourself in with the roll-bar and, damn, it's so hot! A second glance at the crew chief; she nods solemnly and wipes the sweat from her brow. You hope that lug nut is tight and wonder if there's time enough to go to the bathroom. Sweat dribbles down your thigh and collects beneath you. The crew wheels you into the lane. You marvel at the car in the other lane. It looks fast standing still. "Can you beat that?" you wonder as the driver turns a Darth Vader-helmeted head toward you. And the crew chief signals you to start the engine.

The car alive now, your crew rolls you backward, and then with a roar from the engine and screams from the racing slicks you inch up to the starting line. Somewhere from above, above the black smoke and the smell of burning rubber, the voice of an unseen god blares out your name and information about your vehicle. You hear the name of your hometown and feel homesick, and then the name of your opponent and you just feel sick. The crowd roars. Sweat dribbles into your eyes, but you've forgotten the heat. It's been displaced by fear. One last glance at the crew chief—she nods solemnly—and you glue your eyes to the tree and wish you were at home in front of your Apple, and that this were just a video game.

More Drivers than the PGA. The North Hollywood, California, office of the National Hot Rod Association—a small, modern building whose only notable feature is a dragster in the lobby—currently has three Apples; the Upland, California, office has three more. These six computers are used to keep track of information concerning some twelve to fifteen thousand NHRA licensed drag racers who compete in the association's six national divisions: where they live, where they race, what make and model car they run, what class they run in, their mothers' maiden names, and so on. Because of its involvement in handicapping classes of vehicles and setting elapsed time brackets, the NHRA's technical services branch must collect the thousands of times the drivers turn in for quarter-mile runs. It's a lot of data, and the Apples in the office facilitate the necessary processing. The wonder is not that the NHRA uses computers, but that it ever managed without.

The National Hot Rod Association was founded in southern California in March 1951 by Wally Parks, now the chairman of the board of the NHRA and then editor of *Hot Rod* magazine, and several other hot rod aficionados. Originally a car club, the NHRA soon found itself sanctioning racetracks and sponsoring meets. Today, drag racing has more participants, cars, tracks, and races than any other motor sport. NBC's *Sportsworld* and ABC's *Wide World of Sports* will both cover NHRA-sanctioned events in 1984 (ABC for it's seventeenth consecutive year). Companies as diverse as Coors and Hawaiian Punch, Pioneer Electronics and Wendy's Hamburgers, the R.J. Reynolds Tobacco Company and Faberge all sink advertising dollars into car sponsorships.

The drag-racing scene was less glamorous at first. Cars were homemade, and the track was likely to be Highway 1 just past the Phillips's place. Racing was unorganized and unwelcome.

How're We Gonna Keep 'Em Down on the Farm? While Parks was organizing racing in southern California, the racing scene was coming together around the country. In 1953 the chief of police of Orange, Massachusetts, and several members of the local Kiwanis club got together and decided that the kids who were racing needed to get off the street. They approached a group of local people who built hot rods—conventional family cars modified with larger engines, larger tires, custom paint jobs, and almost anything else imaginable—and convinced them to establish a loose fraternity of racers who could, one Sunday each month, use the Orange, Massachusetts, airstrip to race their rods.

One man who built his own car near Orange in Springfield was a civilian aircraft mechanic employed by the Air Force. After he'd raced his own car two or three times at the Orange Airstrip he was approached by some of the racing organizers and asked if he wanted to work tech. "Tech?" he asked. "What's that?"

Bill "Farmer" Dismuke is a trim, friendly gentleman with graying hair and a country manner like Andy Griffith's. Dismuke is an ex-aircraft mechanic, an ex-hot-rod jockey, an innovating force in the NHRA, and an Apple user.

Dismuke has been associated with the NHRA since his hot rod days in Orange in 1953 when he said yes to the invitation to work as a tech man. In 1959 the NHRA asked him to work at the Nationals, and a year later he accepted a full-time position with them. Dismuke has remained with the organization ever since. As technical administrator of the NHRA, he is responsible for writing rules, including safety regulations and rules governing allowable modifications to the machines that race down a quarter mile track. With the help of Dave Danish, National Technical Director, Dismuke also enforces the rules. He heads a team of technicians, known as black hats, who inspect the cars for safety and any breaches of the extensive regulations.

Way back in 1978, Dismuke decided that what the NHRA needed was an Apple computer. The bulk of his job involves collecting information about racers and accidents from the NHRA's approximately one hundred fifty sanctioned tracks and fifteen hundred races nationwide. After years of typing up charts he was eager to find a better way to handle figures. So, in his calculating fashion, he suggested to the NHRA treasurer that the group buy an Apple and, if it didn't pay for itself in two years, he would buy it from them. No, he was told, the NHRA doesn't work that way; they bought him an Apple, no stems attached.

A busy man, Dismuke didn't have time to learn what to do or how to do it on the job, so he took the Apple home on weekends. And he taught himself to use it. And then he taught his wife, Jeni. And then he put it to work.

Dismuke and aide Theresa Clark use the Apple and a spreadsheet to keep track of the points earned by each driver. A win in a national or divisional event earns a driver a number of points, more in national races than in divisional. At the end of the year the winningest driver is declared world champion, with all the rights, privileges, and cash thereunto assigned.

Further, Dismuke keeps track of which of his technical workers—black hats—are available to work which event, to perform inspection and classification of the cars. Dismuke makes ar-

High performance is what it's all about for John Muldowney and Dickie Venables, who work on three-time champion Shirley Muldowney's Top Fuel Dragster. Looking in as interested spectators are (clockwise from center) Joe Sherk, Bill Dismuke, Dave Danish, and Teresa Clark.

IT'S A DRAG!



Apples in The National Hot Rod Association



Among the many sights one sees at a typical NHRA meet (clockwise from upper left): voted "Best Looking," an aluminum Chrysler 504 cubic inch, methanol-burning 2,000-plus horsepowr engine sitting in a Funny Car belonging to Ed Greku—capable of doing the quarter mile in 6.4 seconds, or around 215 M.PH.; oceans of cars; Dick Rosenberg's Jet Funny Car, which doesn't even compete against other cars; trophies belonging to U.S. Nationals Winners Gary Beck for Top Fuel, Kiney Bernstein, whose Funny Car is in back, and Bob Glidden for Pro Stock; next is a shot of Bob in his sporty "T-Bird"; and finally, the starting line, with Ken Veney on the left and Tom Hoover on the right. The "Christmas Tree," which is the starting device, is in the foreground.

rangements with his workers well in advance, "because a lot of guys can't figure a full year's vacation time, so I send a schedule out twice a year. Now that's as simple a database management system as you can get. And it works fine."

The cars you and your opponent are about to race are dragsters, but they have come a long way from the cherry-red fifties hot rod that Skinny, the tall, pimply kid next door, built from a Chevy engine and ball of tin foil in his dad's garage. These machines are Top Fuel dragsters, the top classification of dragster in the NHRA. Although they look like winged, elongated go-carts with airplane engines, they're still cars. They run on nitromethane fules and they go very fast.

But as you sit, sweating in your fire-protective body glove, you're not thinking of facts. All of your energies focus on the green light up ahead; at any moment it will light, and you will know first hand what "very fast" is all about.

Every Day Is Christmas. Racers who are on deck wait with their cars in what is called the staging area; when the lanes are cleared their pit crews wheel the cars into the lanes, where they sit side by side. The cars start their engines and sidle up to the starting line, smoking their tires and putting a layer of rubber on the track and making a lot of noise and generally having a good time. Once in position, the drivers glue their eyes to the starting lights, which are arranged on a pole in front of them. Because of the profusion of colored lights on it, the pole is known as the Christmas tree.

In the sportsman—or nonprofessional—eliminators, the drivers watch as, starting at the top of the Christmas tree, a series of orange lights are lit at half-second intervals. The bottom light is green. Green for go.

The starting line is where most races are won and lost. A quarter of a mile is a short distance for a car, and six seconds a short amount of time. Drivers with a slow start have little opportunity to overtake their opponents. Reaction time—the amount of time it takes for a driver to see the green light and to engage his or her clutch—separates the winning drivers from the also-rans. The reaction times of professional drivers are further tested in that the pros see only one orange light before the green.

Each lane is equipped with light beams which, when broken, start and stop the lane's timer. If a car breaks the beam of light by crossing the starting line before the driver gets the green light, a red foul light is activated—that is, the driver "redlights," an automatic disqualification.

The technical services branch headed by Bill Dismuke accumulates quarter-mile times from the various classes of vehicle and assigns a handicap to those in the sportsman eliminators. Because each vehicle must run a full quarter mile, faster vehicles are not handicapped by having to travel a greater distance. Rather, slower classes of vehicles are allowed to leave the starting line before the faster vehicles they are racing against. Independent starting lights make this possible.

A set of lights located sixty-six feet before the finish line and a second set sixty-six feet beyond the finish mark the timing area. When a car enters this 132-foot space it starts a clock, and it stops the clock when it exits. The amount of time it takes for the car to travel through the timing area is the car's recorded speed. The timing area includes sixty-six feet past the finish line, but according to Dismuke the clocked speed usually does not include the

What's a Funny Car?

Top Fuel dragsters are the premier cars in drag racing, but they are far from the only cars. The NHRA allows a wide variety of cars—more than one hundred vehicle classifications are acknowledged—to compete in its eleven subclasses, known as eliminator categories.

The best known are the professional categories: Top Fuel, Funny Cars, and Pro Stock. These categories are limited to a single class of car; that is, a Top Fuel dragster will only race another Top Fuel dragster. Competition in these categories is further restricted, for the NHRA regulates the equipment permitted to "run" in the professional eliminators. A Funny Car, for instance, may have only a single engine, which must displace a maximum of 500 cubic inches; the car must weigh a minimum of 1,900 pounds, including the driver; and so on. Top Fuel dragsters are allowed any number of engines as long as they displace a maximum of 500 cubic inches, weigh a minimum of 1,700 pounds with driver. Funny Cars are capable of running a quarter mile in about 5.7 seconds at speeds approaching 250 miles per hour. A Top Fuel dragster may run the quarter in 5.3 seconds and hit 260 mph.

Incidentally, there is nothing funny, per se, about Funny Cars. Essentially dragsters with Fiberglas bodies attached, Funny Cars got their name from vehicles in the early 1960s that had mismatched chassis and bodies. The name just stuck. Funny Car drivers may burn their choice of fuels—usually nitromethane. The cars are supercharged—they have air collectors atop their hoods to force air into the carburetor, enriching the fuel mix—and their engines are in front of the driver. Top fuel dragsters may or may not be supercharged; the engine sits behind the driver.

The vehicles that race in the third pro eliminator, Pro Stock, are the most recognizable cars. Stock, a term widely used in drag racing, refers to cars made in Detroit, cars that the average Joe might own. A stock car is to racing what a suit off the rack is to fashion. Well, almost. Pro Stock cars may look like Detroit's finest, but they undergo hefty modifications to both the engines and bodies. Pro Stock entries must have engines of the same make as the car—you can't race a Ford car with an Oldsmobile engine. The engines, like those in the other Pro vehicles, may displace a maximum of 500 cubic inches. A Pro Stock car must weigh under 2,350 pounds with the driver. They must also be North American-built.

Stock cars run on gasoline, and even this is regulated by the tech men. Because, in the words of the NHRA rule book, "Gasoline is a good electrical insulator, or dielectric, and its relative effectiveness as an insulator is represented by its dielectric constant," a measurable quantity, the NHRA tests the D.C. of each driver's gasoline. The tech men can thus prevent any advantage gained through the use of additives.

The top racers in each of these categories—Top Fuel, Funny Car, and Pro Stock—generally have sponsorships from large corporations. They pursue drag racing as a means of earning a living, and it can be a very lucrative means. The top money winner in 1983 was Gary Beck, a Top Fuel driver from El Toro, California. His 1983 winnings and cash bonuses totaled $134,000.

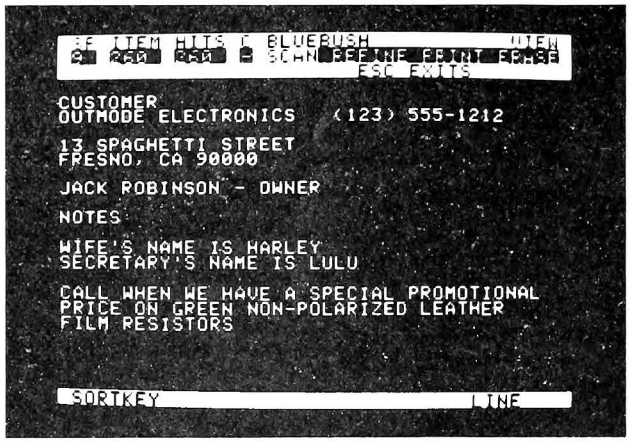
For the Love of a Car. Eight eliminator categories for nonprofessionals provide room for nearly 150 classes of vehicles. These eliminator categories are for people who just want to race their cars. While the highest levels of competition in these eliminators do offer prize money, most racers simply follow race as a hobby. They do it for the cars, the speed, the smell of burning rubber—they do it for love.

Amateur eliminators include Top Alcohol Dragster, Top Alcohol Funny Car—both of which are scaled-down versions of the professional categories. These cars burn methanol rather than nitromethane; they still go fast. A Top Alcohol Funny Car can run as fast as 220 miles per hour.

The most interesting of the amateur eliminators are the Competition eliminator and the Stock eliminator. Cars in racing in these categories can vary widely. In the Competition eliminator, a gas dragster may race against a supercharged sedan. This is made possible through a system of handicapping.

The Stock eliminator, the lowest in the hierarchy of eliminators, is restricted to passenger cars with almost no modifications. More specifically, Stock cars must be 1960-or-newer factory production cars. Most are American-made, although some foreign and domestic sports cars are allowed. Beginning racers generally start out racing Stock.

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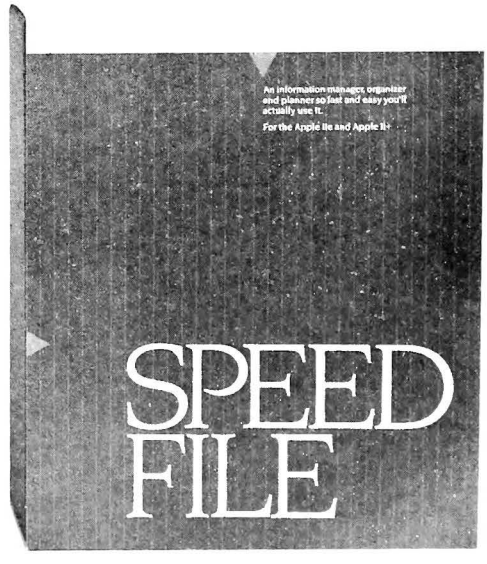
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car's deceleration.

"Drivers will pull their parachutes while they're in the traps, but the chutes don't activate till after they're out. At two hundred fifty miles an hour they're traveling so fast that in just five-eighths of a second they're through the traps. They see the finish line coming up and think about pulling the chute; well, when they've thought about it they're already through." Still, because in some cases—perhaps a competitor redlighted at the start or loses an engine—a car actually begins slowing before it reaches the finish line, the recorded speed may not be the fastest the car reached during the race.

The NHRA records both the speed and elapsed time of every race. Elapsed time plays an important role in the sportsman eliminators. Working under the theory that drivers can get faster times simply by making expensive modifications to their cars, the NHRA not only limits mechanical improvements but also sets minimum allowable elapsed times, or ET brackets. Inexpensive, home-built cars can thus be feasible competitors in the sportsman eliminators. Anyone who runs the quarter mile in under a minimum time is eliminated. Another dimension is added to drag racing: the object is still to win, but over the minimum time. The ET bracket for the Super Gas eliminator is 9:90. Says Dismuke, "If they go faster than that they're thrown out. And, they can run any size engine they want as long as they weigh over 2,100 pounds, it's a safe vehicle, and they don't run under 9.90. . . . If a driver gets a car that'll go 9.92, 9.91, 9.90, he doesn't have to do anything with it. All he has to do is drive it."

Accidents? You Never Said Anything about Accidents. "We ran over twenty-eight hundred events in 1983," says Dismuke. "And they have accidents, and we have to keep track of them."

Dismuke uses the same spreadsheet program for accidents that he uses to keep track of drivers and points earned. The information is mostly used for insurance purposes—insurance companies are very anxious about staying informed when cars turn into fireballs flipping end over end down the track—but Dismuke also analyzes information to determine what, if any, modifications to the safety rules should be considered.

"We had twelve fires and blower explosions at the Winternationals, and nobody was injured at all. Segrini [Funny Car driver Al Segrini], when he blew up at the end, hit me on the heel with a piece of the rotor. If I'd had my sneakers on it would have hurt—but he was just fine. It did an awful job on his car; the whole thing was just one big ball of fire." When a driver steps uninjured from a flaming wreck, he knows his black-hatted tech men have done their job. And the NHRA accepts no excuses when safety is involved. "We don't care who it is; if it isn't right, you either fix it or you don't run. Period."

Accidents are fairly common, but safety equipment such as Nomex fire suits and fire extinguishers have kept injuries to a minimum. Each car must carry a fire extinguisher, five pounds for the driver compartment and fifteen pounds for the engine. "When Segrini exploded, he hit the fire bottle. Twenty pounds of 1301 Freon, which is the same stuff they use in computer rooms. It just covered him and everything else in there.

"Years ago, when they were racing more gasoline-fueled cars, they were getting burned pretty badly. I know Don Garlits wouldn't run for a long time without an ambulance following him down the track, because he was burned so badly one time. And the reason he built that rear engine car was because he cut part of his foot off with an explosion at Long Beach. He blew a fly-wheel and it cut the car right in half. He was bent over double right where his feet were and he lost all his toes on one foot. And he said no more front motor cars."

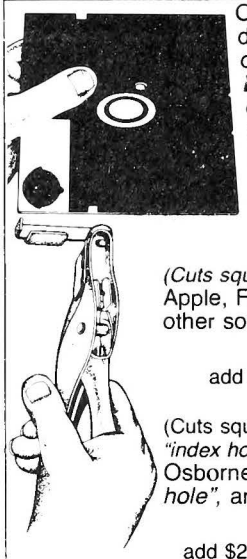
Danger, But Don't Forget Glory. Working closely with Dismuke is Joe Sherk, publicity director for the NHRA. Sherk frequently goes afield to cover all of the twelve National events promoted and produced by the NHRA each year, and when he goes his Apple goes with him.

They have a neat system, according to Dismuke. "Right now he has an Apple and two disk drives that go in an aluminum case he carries with him. He takes it wherever he goes. He doesn't take a monitor; he has a monitor here and another in our registration trailer." Sherk picks up his monitor and heads for the tower. By the time the race is over he will have sent most of the results back to Dismuke by modem. The information is set as a press release and is printed out on one of two NEC Spinwriters in Dismuke's office, camera-ready for printing and release to the media. Using this system, Sherk sent the results of the 1983 Springnationals in Columbus, Ohio, via the modem directly to the computer at the *Los Angeles Times* and the results were in the paper the next morning—a first for the NHRA.

The NHRA also publishes a weekly newspaper, the *National Dragster*. The push for modernization has carried into the editorial offices of the *Dragster*, despite reluctance on the part of some of the writers. Director of publications Neil Britt has begun lobbying for the purchase of either Macintoshes or Lisas for the newspaper staff.

Long in coming, but coming nonetheless, the innovations Dismuke foresees are major. Hoping to modernize the process at the track, in 1980 he introduced an Apple computer into the tower. Ordinarily, the tower—the central processing unit at the dragstrip—requires several people to operate the system. The most obvious is the announcer, who reads color information about each driver from an index card, which is pulled up by the spotter, who watches to see which two cars are competing in which heat. Two more people keep track of time—each one records the elapsed

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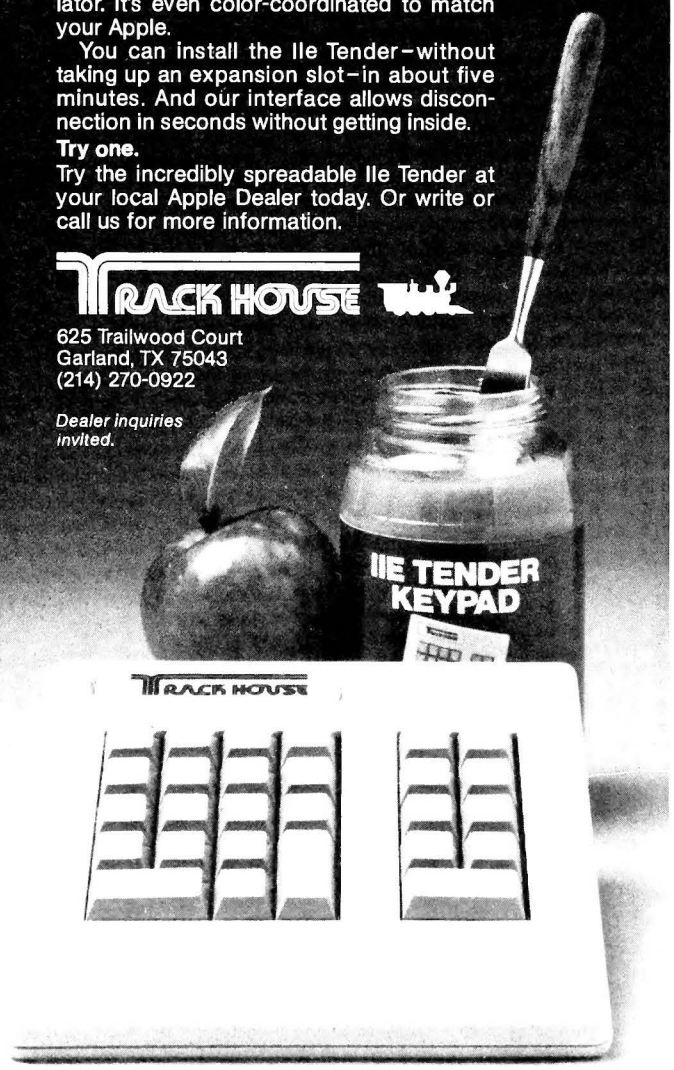
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time and mile-per-hour of the car in lane. Four "ladder and administration" people seed drivers and arrange them into heats based on their qualifying times. The winner of each heat is paired with the winner of a different heat, and the winner of their heat is paired with the winner of another, and so on up a "ladder" to the top rung—the unbeaten driver is the winner. Also, as many as five people near the finish line receive race information from the tower and write time slips for the drivers so that they have a record of their performance.

"All this can be done by computers," Dismuke says, "and it's so simple. . . ." Simple enough that they gave it a try. One problem they had was that, with the number of drivers and cars involved, the floppy disk drive took too long. In the crowded eliminators, such as Stock, cars were coming up to the starting line faster than the computer could get information for two different cars onto the screen.

"It was set up in 1980. The only thing that would have made it work at that time was a hard disk," says Dismuke, "which they didn't want to go to at that time because they were kind of scared to. It wasn't the expense, because we could have put the whole system in operation for less than ten thousand dollars then. And by saving on paying people to be there, plus motel rooms, lunches, traveling, and things like that, it would have paid for itself in a year's time."

But Dismuke doesn't quit. "We're working on a new deal right now that would take into consideration the uses of a computer for our timing where everything would be automatic. The way we do it now involves a lot of paperwork."

In 1980 Dismuke had software written to divide the Apple's screen vertically to represent the two lanes. Information for the car in the right lane appeared on the right half of the screen, information for the left car on the left half. This would have meant that the announcer could do away with index cards and read his color material right off the screen; one of the two spotters would also be the computer operator. The work of time keepers, ladder and administration people, and the time slip writers at the finish line could all be done by the computer.

There would be many advantages, Dismuke says, turning to his Apple. "The times could be input automatically, right out of the timing clocks into the computer." The computer would then spit out the winner and match up the next race. "The printer would be at the bottom end, for the time slips. The way it's done now, two people sit on the phones and write the slips and another person hands them to the drivers; with the Apple system, the slips would come out all done, car number, class, ET, miles per hour, win or lose. But I think this was just a little bit like the old Chrysler air flows they were just a little bit ahead of their time."

It will happen; Dismuke seems pretty optimistic that the NHRA is coming around. "They weren't ready for it. Now they're getting the idea, saying, 'Hey, that was a good idea, why didn't we do it?' 'Because you said no.' So they're thinking about it."

Bringing It All Back Home. In addition to arranging racing events, licensing drivers, regulating vehicle modifications, inspecting safety equipment, and collecting various kinds of race-related data, the NHRA performs a service that affects most new-car buyers. It's fairly often that a car manufacturer wants information regarding the performance times of a new car (usually a high-performance car): the amount of time it takes to go from zero to fifty and zero to sixty miles per hour, the amount of time it takes to go a quarter of a mile, and the distance required to brake to a complete stop. Manufacturers frequently use such data for advertising purposes or to make comparisons with cars made by competing manufacturers. The NHRA certifies this information by performing tests of its own, and, because it's a technical service, timing certification falls into the bailiwick of none other

than Bill Dismuke.

He uses a strip at the Pomona fairgrounds, but not the same strip as the dragsters use. "I use a surface area where there's no rubber. If I put a high-performance vehicle on a dragstrip, all of the rubber would help it, but for a low-performance vehicle—you know, a little four-cylinder front-wheel drive—the rubber would cause the car to bog, and it wouldn't give a good time. . . . Son, you could go out there on the track and find it a half-inch deep around the starting line. That's the rubber that's burned off when they're smoking the tires.

"Then I pick a driver. And he just beats and thrashes the cars to pieces. One day I heard a driver abort a run—he missed a shift—and saw him turn around and come back with the shifter out of a $28,000 Porsche in his hand. It just broke off. They lose fan belts and things like this, but they get the maximum performance, and they do everybody's car the same way."

The testing device used by NHRA is called a fifth wheel. The old fifth wheels weighed about seventy-five pounds. A man named Paul Lamar, owner of an Apple II board before Apples came with keyboards and chassis, teamed up with pioneer Apple programmer Bob Bishop (creator of Applevision) and together they wrote an assembler program and, with that, all the software necessary for a 6502-based computerized fifth wheel.

Their end product is a twenty-four-pound fifth wheel. The wheel attaches to the side of the car by means of a ten-inch suction cup. The computer, printer, and power source are encased in an aluminized box and sit on the passenger's seat, drawing power from the car's twelve-volt battery. The system actually contains two microprocessors, the regular Apple 6502 and a 6511Q that controls the printer.

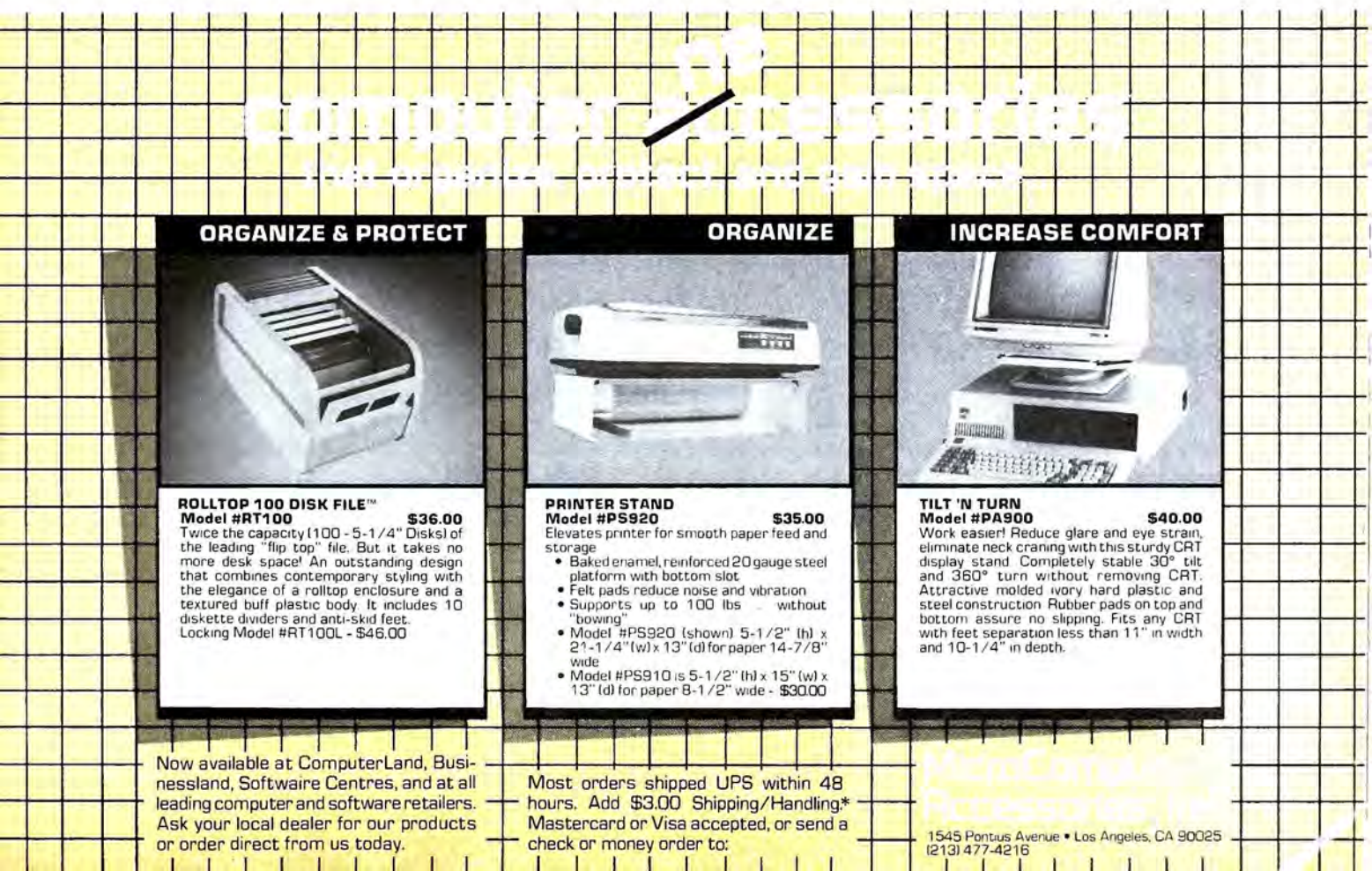
Lamar and Bishop used their assembler to write a real-time multitasking operating system that measures the car's speed, rate of acceleration, braking time, and cornering speed with a series of five interrupts. With these interrupts the computer knows when the car has traveled each foot, the amount of time it takes to travel each foot to the hundredth of a second, information from the speedometer every sixty-eight milliseconds, when the car begins braking, and when the car has stopped. The computer records this information and feeds it to the printer, which begins printing as soon as it receives the data and prints continuously. The result is a long, thin piece of paper that looks like a receipt from a grocery store and shows the car's performance record to the hundredth of a second.

The fifth interrupt involves a cornering measurement. For this test, the computer is placed outside the car. A telescope equipped with a photo cell is attached to the computer and watches the corner. When the background changes, an interrupt instructs the computer to begin timing; a second interrupt instructs the computer to stop when the background reverts to normal. Thus the amount of time it takes the car to round the corner is accurately measured.

Frankly, however, the NHRA's role as automotive certifier doesn't interest you; you just got your orange light—green light—hit it! For a fleeting moment you wonder if you engaged the clutch a millisecond too soon . . . in the rush of color you could see no red foul light. Time has slowed—the acceleration has pressed the breath from you, but you can breathe when it's all over. There's the timing area—a quick glance to the left and Darth is right in there, neck and neck. There's the finish, pull the chute—out of the timing area. Alive.

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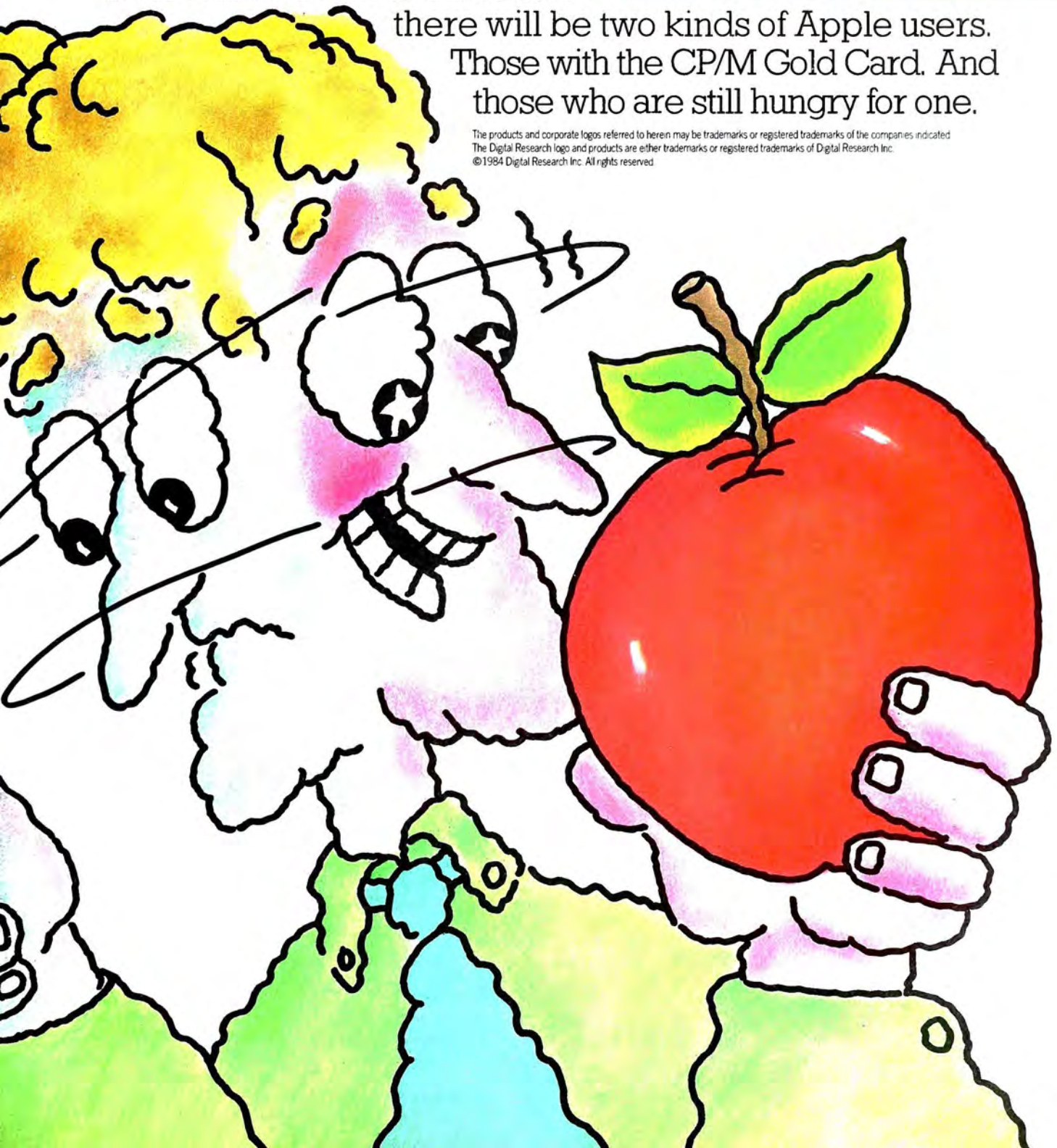
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How to Spend Money: Part II

Let's see. Last time, we were finding out how we could take the money we were saving for food, rent, and clothes for the kids and spend it on various things for our Apples. The story continues.

Wham, Bam, Thank You, RAM. One of the problems with computers is that they tend to fall into the hands of people—and people tend not to be satisfied with what they have. Back in the early days of computers, 4K of RAM was a decent amount of memory. Then came 8K. And 16K, 32K, and 48K. For a while, 48K seemed like just enough; 48K of RAM was the amount of memory Apple II Pluses came with.

But like someone who has just moved into a new house, computer hobbyists realized that their spacious 48K computers just weren't roomy enough. They needed more memory. Most programs ran just fine in a 48K environment. But programmers who wanted to write in Pascal and other languages needed more than just 48K.

In late 1979, the Apple Language Card came out and enjoyed limited popularity. The card was just a circuit board with extra RAM chips on it to give the Apple some extra memory. Installing the Language Card wasn't the easiest thing in the world. It required removing a chip from the motherboard and plugging a cable in its place, which connected to the Language Card. The card was plugged into slot 0, and two other chips had to be replaced on the disk controller card. Finally, it was possible to use Pascal. And get this: If you wanted to use a regular DOS disk, you had to boot another disk to prepare the Apple for the DOS disk.

What a pain. It was kind of like putting K-Mart tires on the car for city driving and then switching to Michelin radials when you wanted to drive on the freeway.

Because of this hassle, most people just installed the Language Card whenever they wanted to run another language; the rest of the time it sat gathering dust.

After a while, people wanted to get the extra 16K memory that the Language Card offered, but they didn't want the Pascal software that came with it. The whole package cost about $500 most of which was for the software. At the same time, software publishers were discovering ways for their programs to use the extra 16K. Hearing this, hardware companies realized they could make some good dough by manufacturing and selling 16K RAM boards. Sell they said, and sell they did. RAM cards became a very popular item.

And that's how this whole business of adding more memory to one's Apple began—and it was only the beginning.

"Well, heck," thought hardware makers, "if we can add 16K to an Apple, let's try 32K." And they did. After that came 64K and 128K boards. Where is all this going to end? How much memory can a program use? First, let's find out what a 16K board can be used for.

You Just Gotta Believe. When computer memory is being dealt with, most figuring is done abstractly. That is, you can't really see the extra 16K (or any of the 48K, for that matter). All you see is chips, and you know (hope?) the 16K is there. Also, using a total of 64K involves something called *bank switching*, which allows two blocks of memory to share the same address space; however, the 6502 microprocessor can have access to only one block at a time.

In the Apple's memory, addresses $0000 to $BFFF are where the 48K of RAM resides. Programs are loaded from disk and put here. Data generated by programs is stored here. Graphics go here. From $C000 to $FFFF is mostly ROM—the programs that are "built into" the computer. The memory addresses for the additional 16K of RAM (in the IIe or in a II Plus's RAM card) are also from $C000 to $FFFF. It's like two people having the address "5 Kumquat Lane." The only difference is that one is in Kalamazoo, Michigan, and the other is in Newark, New Jersey. Different things in different places. Only the *names* of the places are the same.

What bank switching does is tell the 6502 to go to ROM's $C000–$FFFF addresses when it needs something from ROM; if it needs something from RAM, it should go to the II Plus's RAM card or to the IIe's $C000–$FFFF addresses. (Check the index of the Apple IIe *Reference Manual* for more information on bank switching. Apple II Plus fans will have a harder time finding bank-switching details, since 48K Apples don't bank switch unless they have 16K cards in them.)

There are several ways software publishers take advantage of RAM cards. One way is by writing programs that are so complex that they require 64K in order to run. The only problem is that there are lots of 48K Apples out there that won't be able to run those programs. A more common way is for programs to use the extra memory just for data storage. A program can either throw data into the RAM card for storage, or it can move DOS from the main memory to the RAM card. The advantage of moving DOS is that it frees the 10K of main memory that DOS usually takes up, allowing most data to be stored in main memory, rather than on the RAM card.

Bank switching is controlled through *soft switches* (switches in a program), and most of us don't have the time to learn how to create or manipulate them. Luckily, because Apples with more than 48K are becoming commonplace, software writers write their software to control soft switches so the people using the programs don't have to.

Hot Memories. As we said earlier, computerists tend not to be satisfied. That's why hard-

ware companies eventually started developing RAM cards with more memory. While it's nice to have a lot of extra memory, there are some drawbacks to having 32K and 64K RAM cards. These babies draw a lot of power from their slots, and they can get very hot very quickly. Not only do cards like these heat up, they also restrict the air flow through the computer.

Computers can start acting weird when they get too hot; programs hang in the middle, lose information, and generally start doing things that cause wear and tear on the human nervous system. Not all computer systems react this drastically, and it's hard to know whether it's the heat or a malfunctioning chip that's causing the disturbance. It's up to you to judge. With the disk controller card, a printer, and possibly a modem all plugged in at once, things get mighty toasty inside the Apple, so you might consider adding a cooling fan to your computer to ventilate it.

Another popular card for the Apple is one that gives it the power to run CP/M software. With it, the Apple can execute software that used to be for 8080- and Z80-based microcomputers only. All together now: "What are CP/M, 8080, and Z80?"

My Father, the 8080 Surgeon. Every microcomputer is based around a microprocessor. A microprocessor is the brains of the computer, doing most of the computer's work. It keeps track of the system's timing, handles the routing of information, and performs other general organizational chores.

There are all kinds of microprocessors. The Apple uses a 6502 processor, which is also used in the Atari 800 and Commodore 64 computers; Apple's Lisa and Macintosh computers use the Motorola 68000 processor; and the IBM PC uses an 8088. Don't be too concerned with the numbers and what they mean. Just think of them as the chip's names, the way we think of 280-Z as a kind of Datsun or a 450 SL as a kind of Mercedes.

The 8080, made by Intel, and the Z80, made by Zilog, are two popular microprocessors. A big advantage that these two provide is the ability to use the CP/M operating system. We've been throwing around the term CP/M a lot in this column, and now we're gonna find out what it means.

CP/M stands for *Control Program/Microprocessor*, a spiffy operating system for 8080 and Z80 systems, created by Digital Research. CP/M is to 8080 and Z80 computers what DOS is to the Apple II family and what SOS is to the Apple III. Want more proof? Lookit: CP/M does a lot of the same things DOS does. DOS has *catalog*, *delete*, *rename*, and *save*; the corresponding commands in CP/M are *dir* (directory), *era* (erase), *ren*, and *save*. It's not so alien after all.

The nice thing about CP/M is that so many different kinds of computers can use it; normally, different computers can't run each other's software. Apple software won't run on an IBM PC (without extra hardware) because of the difference in operating systems; Apple uses DOS, while IBM uses MS-DOS. Or, closer to home, Apple II software won't do anything on an Apple III (unless the III is in II emulation mode) even though they both use a 6502 processor because the III uses SOS as its operating system. Computers using a standard version of CP/M, however, can run each other's software. Here's why.

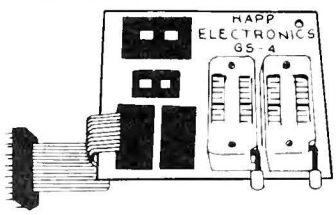
More Killer Bs. CP/M is made of two parts: the *BDOS* (Basic Disk Operating System) and the *BIOS* (Basic Input/Output System). No matter what computer CP/M is installed in, the BDOS remains unchanged; it's the same BDOS for all computers. Because it's the same on various machines, CP/M software will run on all of them.

Whereas the BDOS is an environment in which the software runs, the BIOS is something that translates input and output between a particular computer's hardware and the BDOS. BIOS is needed because, even though the BDOS is the same on each computer, each computer's hardware is different. As a result, a program written on one computer can run on a variety of computers without much modification as long as each computer is running the same version of standard Digital Research CP/M.

So what's all this have to do with Apples? By itself, the Apple can't run CP/M software, but with a little help it can. With a CP/M card (sometimes called a Z80 card or 8080 card), the Apple becomes almost like two computers in one. It will work just like an Apple until you tell it to turn on the CP/M card, usually through a command or by booting a CP/M disk.

Many of us are quite content running software written for the Apple. Because CP/M is

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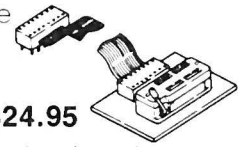


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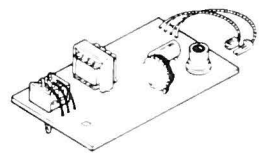


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Reviewed by John Martellaro, September 1983, based on Peelings II rating system for performance and performance to price ratio.

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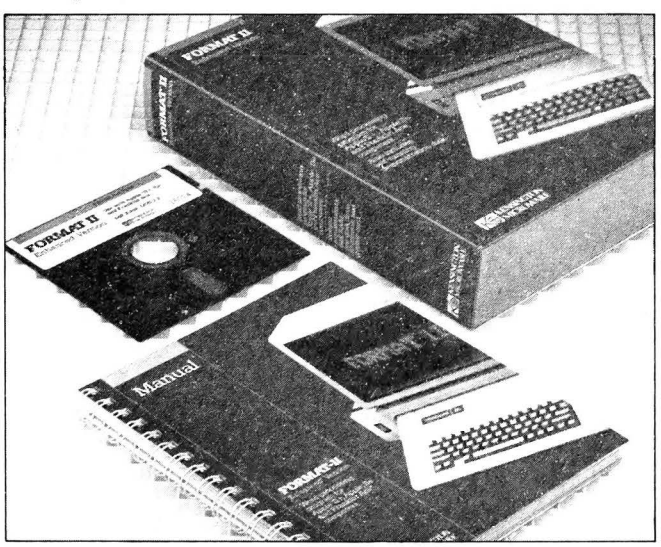
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available across many different kinds of computers, there's a lot more software available in CP/M format. (Software publishers are no fools. The more machines there are that can run their software, the more potential customers there are.)

Cards that give the Apple CP/M capabilities usually have names with *80*, *Z80*, or *CP/M* in them. Some of them offer the bare bones of what's required for CP/M, while others contain nice extras.

The last card we're going to look at doesn't offer anything powerful like extra RAM or the ability to run CP/M software. It's the clock card—something that's just kind of fun to have.

As Opposed to Fake Time. When talking about time, we have to understand the difference between time as it relates to us people (real time) and as it relates to the computer. The Apple can perform operations that are measured in millionths of seconds but doesn't have any built-in way of integrating them with the way the world works.

We use clocks and calendars to help us know when to leave for work, go to the airport, start the oven, or turn on the television set, but none of these kinds of time functions exist in the Apple. To help the Apple cope with the hassles of human schedules, there are *real-time clocks* (also called clock cards or clock boards).

Here's what a lot of us think: "Why the heck would the Apple need to know the time of day and day of the year?" After all, some programs ask us to enter the time and date so the information can be recorded on disk. We just have to look at a watch, figure out what Mickey's arms are telling us, and type in the time. True, so true. But sometimes that's neither possible nor convenient.

Suppose the computer is set up as a bulletin board service, and we want it to be able to record the date and time each caller posts a message to the system. We could have the program ask the caller to type in the information, but that's troublesome for the caller. We could sit by the computer twenty-four hours a day and enter the information ourselves, but that means we wouldn't be able to go out for an ice cream cone whenever we felt like it. A real-time clock could do that for us; lots of BBS programs already have provisions for adding clocks to systems.

In such an application as our BBS example, the real-time clock acts as a special kind of clock that the computer can "look" at to take note of the time.

A real-time clock can also function as an alarm clock. Most cards can set off an alarm for the computer at a certain time (sometimes on a certain date as well). When that alarm goes off, the Apple receives an interrupt request, which is like someone saying, "Hey, come here and do this. . . ." At that point, the Apple stops whatever it's doing and goes off to do what the interrupt requested. After it finishes doing what the interrupt asked it to do, the Apple goes back to whatever it was doing before it was interrupted.

Clock cards keep extremely careful time—sometimes in thousandths of seconds. Though people rarely need to measure things that precisely, computer interrupts can occur hundreds of times a second, making such exactitude necessary.

When Swiss Timing Won't Do. So who needs something like this? Teachers and scientists can use real-time clocks to measure the time it takes for a student to answer a question, for a rat to run a maze, or for anything requiring measurement of response time. Business software also takes advantage of real-time clocks, automatically marking the date and time on invoices, transactions, or accounts.

Real-time clocks can make the Apple appear to do two or more things at once. Suppose you've just finished debugging a long program and now want to print it out. Naturally, after such a mind-grinding programming session, you'd like a little recreation to help you wind down. With a real-time clock (and some programming ability) you can print the program listing and play a computer game at the same time; it's usually not possible to do this without a clock card.

When you have a real-time clock, all you have to do is tell it to interrupt the printing process every now and then and switch over to the game. Moving back and forth between activities happens so fast that to us it looks like both are going on at the same time.

Keeping time isn't all that real-time clocks do. Some clock cards act as clock, serial input and output card, and parallel output card, all in one. In addition to keeping time, a card like this can act as an interface card for printers and modems.

For household duties, some cards work with the popular BSR X-10 appliance control system. Here's an example in which the Apple works like a timer. You can set it to start the coffee brewing before you wake up, switch on the lights in the evening if you're not there, or get the air conditioner going so the house is a reasonable temperature by the time you get home.

Overdrawn Again. There are as many things to add to your Apple as there are people with ideas of how to enhance it (or of how to make a fast buck). A few things we didn't get a chance to look at in detail include eighty-column cards to change the Apple's display from forty characters wide to eighty, lower-case chips (for II and II Plus only) that let you see things in upper- and lower-case letters, music synthesizers, light pens for drawing fancy pictures, boards for generating hefty arcade-game sound effects, and digitizers for creating near-photograph-quality pictures on-screen.

Just flip through the pages of this magazine and see how many different kinds of things are out there. Starting to feel like a kid in a toy store? If it weren't for limited funds, a lot of us would probably be slapping things onto our Apples left and right.

That's one of the nice things about the Apple; you can add so much stuff to it. In that regard, Apples have a magical quality about them. They make us greedy real, real fast. Just make sure you have overdraft protection.

Have fun and spend wisely. ■

They laughed when I sat down to learn programming...



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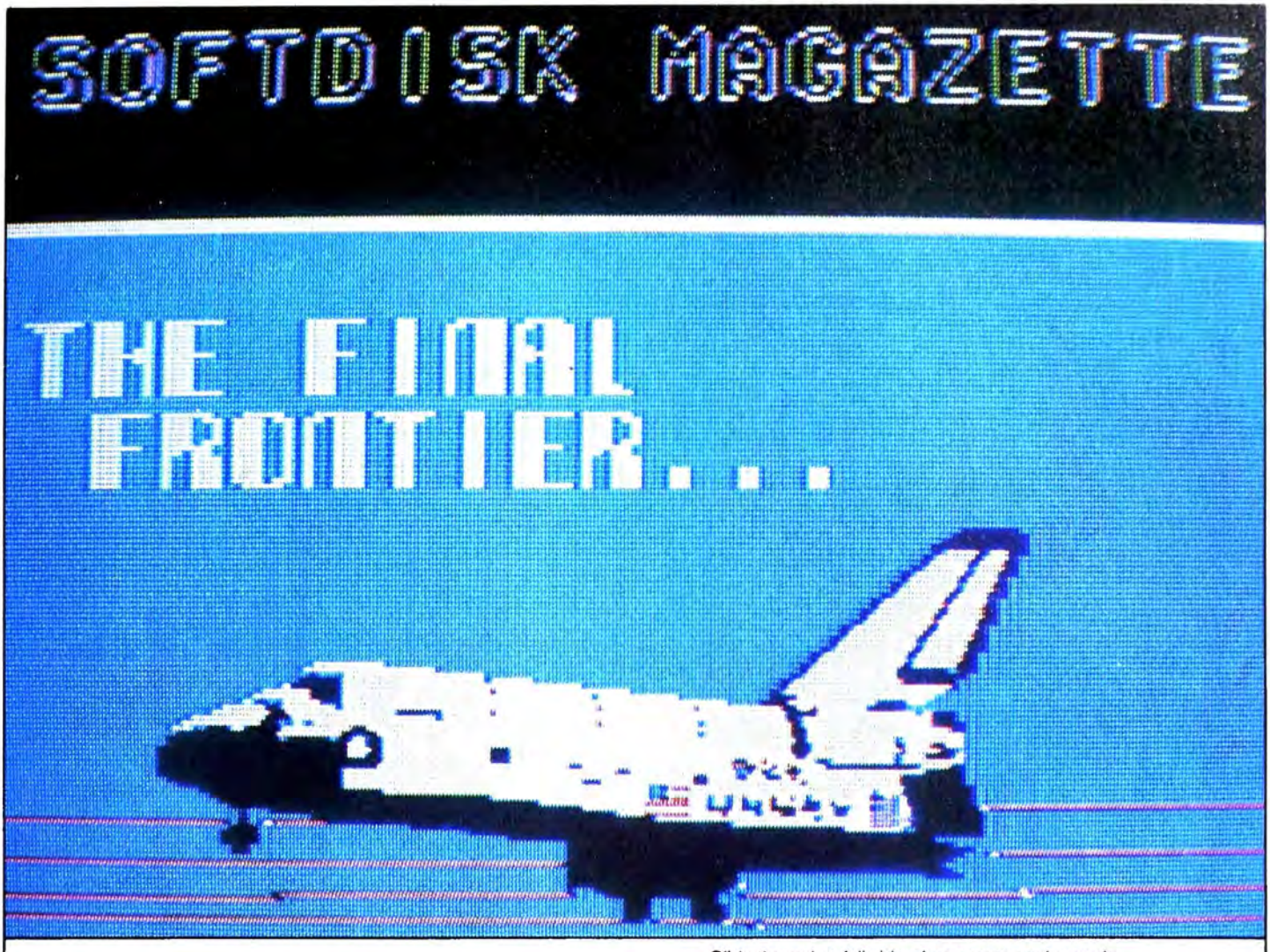
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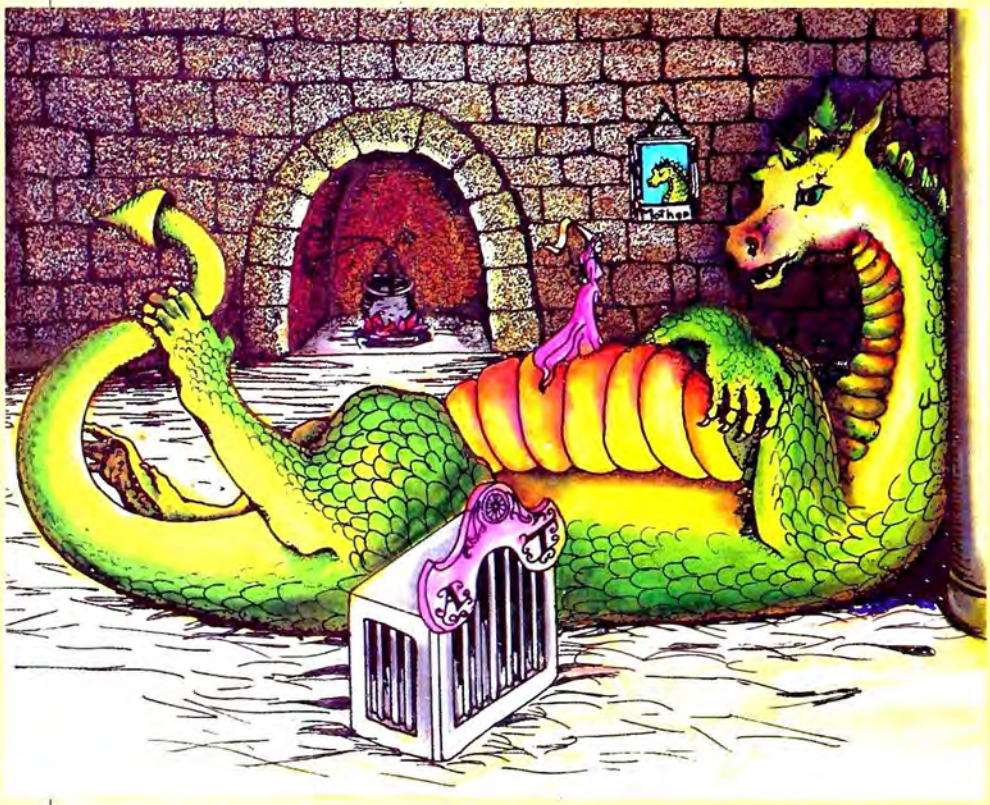
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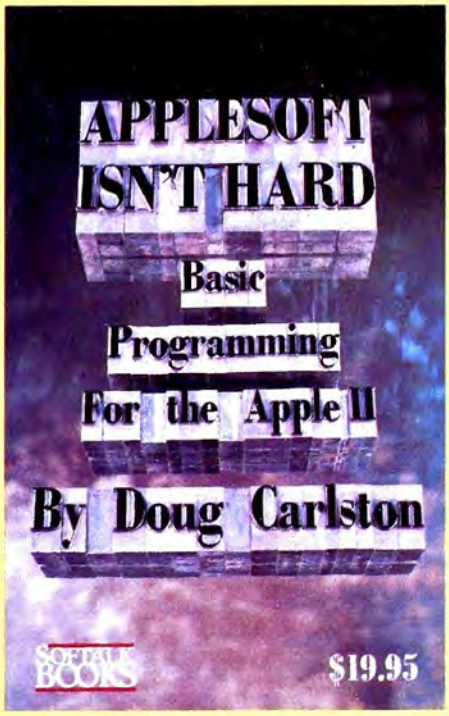
Having worked through this book, you will have learned to create many types of Basic programs—adventures, poetry, arcade games, and testing programs. These programs, and more, are in the book. Even better, you can use your knowledge to expand, change, and create your own.

Recommended for ages eight-adult. This book has been debugged by the kids in the Computer Workshop, a private school for learning computer languages. Available in April 1984.



Tricia Jordan

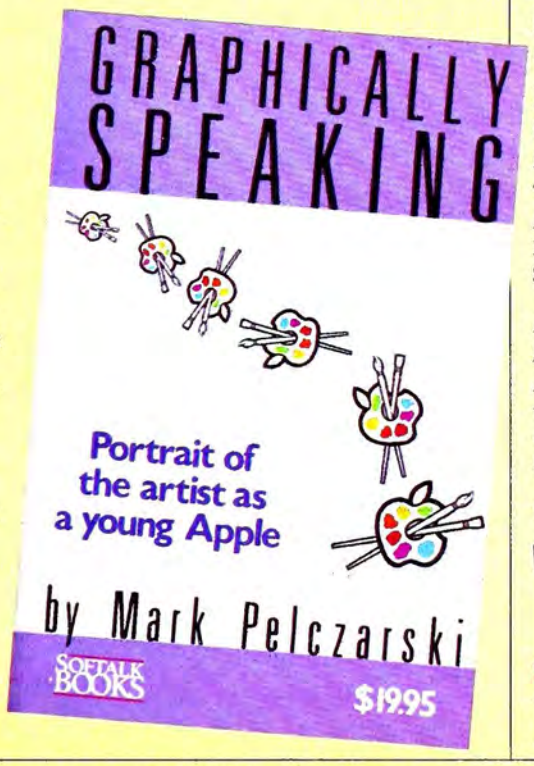
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Can Penguins Draw?

There is one type of penguin, located in Illinois, that can indeed draw. These are rare electronic penguins that have proved their graphic worth through programs such as *The Complete Graphics System* and *The Graphics Magician*. One member of this unique species, Mark Pelczarski, can show you the tricks of the trade with his popular book. It's got hi-res animation, drawing programs, picture packing, shape tables, and everything else you need to create art on an Apple.



Softalk's Reading List.

The Apple For Your Basic Kid: A Programming Guide
Written and Illustrated by Tricia Jordan
A thorough and delightful manual for learning Basic. Addresses both simple and complex aspects of the language in an easy-to-follow format aimed at ages eight through adult.
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Applesoft Isn't Hard: Basic Programming for the Apple II
By Doug Carlston
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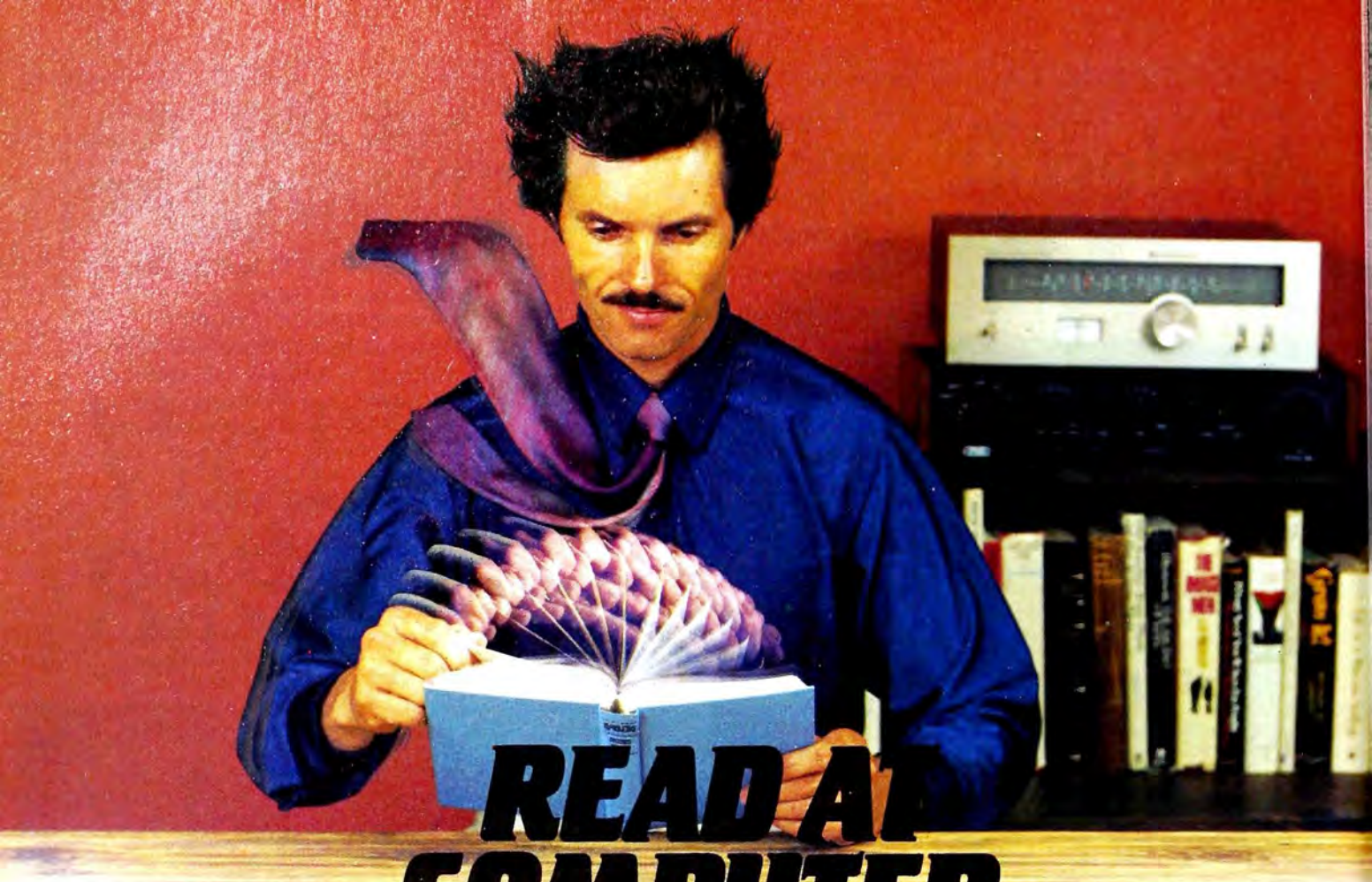
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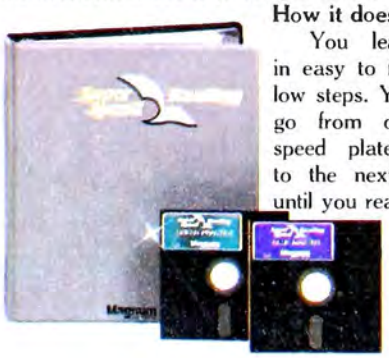
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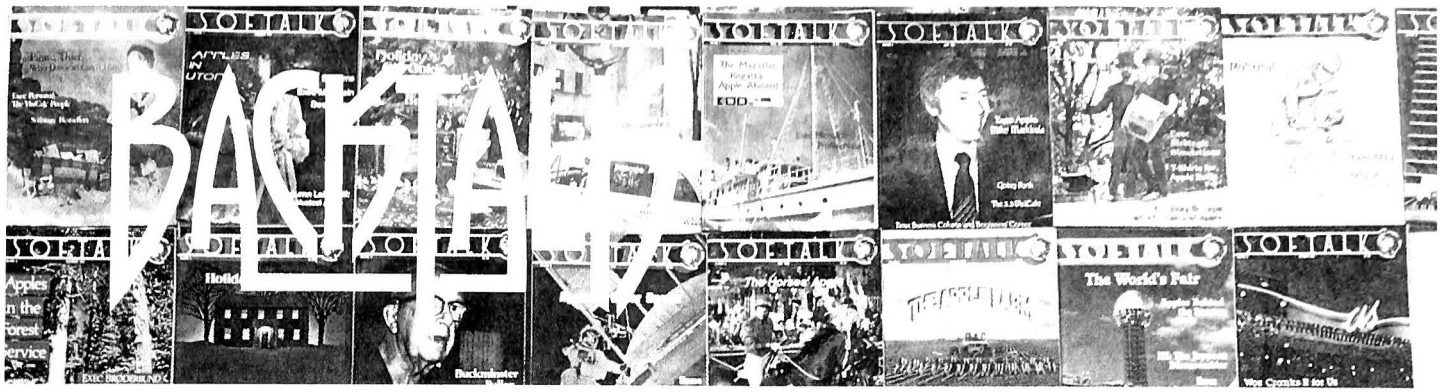
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EDUWARE UNDER A PEACHTREE
THE COMPUTERMAN OF FOLSOM GOES FREE

Personal Problems Can't Defeat Caring Company

BY TOMMY GEAR

"Five years ago any fool could walk in and make it with a little bit of talent and a lot of hard work. Today that isn't the case," says Sherwin Steffin, vice president of research and development at EduWare Services, a subsidiary of Management Science America (MSA). "You've got to have a lot of talent and resources, and you've got to know what you're doing."

EduWare Services came into being at a time when people needed only a dream and a flair for programming to start their own software companies. The company, at first, was underfinanced and lacking a sophisticated programmer. A *Softalk* profile in 1981 described EduWare as born to fail. But failure was not a contingency that cofounder Sherwin Steffin was likely to accept.

It's Hard to Be a Saint in the City. For a while, the company did everything right, sort of. Steffin and cofounder Steve Pederson got in on the education market when it was in its infancy. The company latched on to a hot programmer, David Mullich, who wrote *The Prisoner* and *The Prisoner 2*. Before being acquired by MSA last year, EduWare's product line included interactive fantasy games and interactive simulations, in addition to an award-winning line of educational wares.

By 1982 it became obvious that things could not continue as they had for software publishers. Rapidly climbing marketing costs and heavier competition were taking their toll. The golden years—or months—were over already for many who had helped build microcomputing into an exciting industry.

Steffin realized early on that for a one-million-dollar software company like his to survive the shakeout, there were three alternatives. The first was to seek out venture capital, the second was to make a public stock offering, and the third was to find a parent company.

"With venture capital, the investors come in and take a big chunk of your company, they pump some money in, and then they go away," says Steffin. "We would have needed to acquire more management strength and expertise—a lot of skill very rapidly—so that the money wouldn't just be wasted. In many respects that would have put a lot of stress and strain on the organization."

No EduStock. The second alternative of going public was equally risky, according to Steffin. "When the SEC gets its hands in your pockets, life can get very miserable. The market is very much attuned to quarterly performance, and the software industry is very fickle. We were a little scared away, knowing we'd have to address that kind of market mentality rather than being able to concentrate on more long-term strategies."

It was the third route—acquisition—that Steffin and troupe chose.

"MSA is the largest independent software company in the country, and they approached us," Steffin recalls. "We saw them as having an ideal kind of mix." Having previously specialized in mainframe software, MSA acquired Peachtree in 1981. In EduWare, MSA saw an opportunity to develop a strong presence in the educational software market.

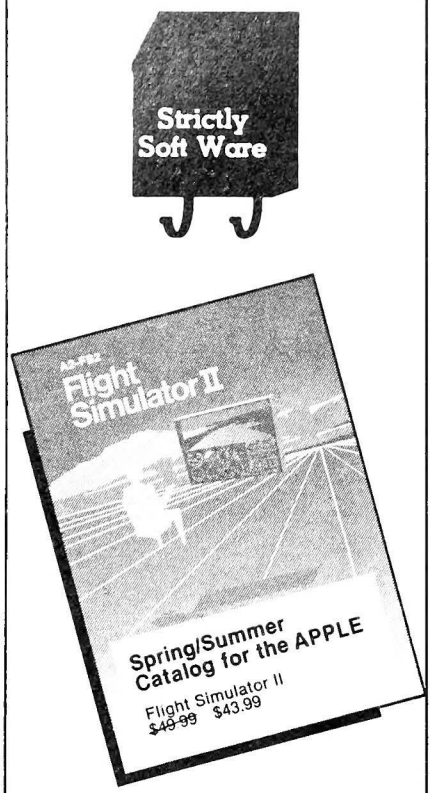
"MSA knows the problems involved in developing software, they know the kind of support we need when it comes to management skills, and they can provide superb public relations and marketing resources," says Steffin.

In July 1983 EduWare, now based in Agoura, California, tied the knot, becoming a part of the MSA family and bidding a fond farewell to many tasks that had occupied them as publishers. Steffin, usually the model reserved businessman, bought a new Porsche the week the deal was closed.

"Things have not changed substantially with the acquisition, except now we breathe easier at night," Steffin admits.



No more black clouds hanging over him. Co-founder of EduWare services Sherwin Steffin and his new Porsche 944.



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"Anybody who got into the software business as an independent entrepreneur has a very large black cloud hanging over his head called contingent liabilities," Steffin muses. "You borrow money and sign your own name to it as well as the corporation's. After the debts got past a half million dollars, we lost count because none of us had that kind of money kicking around if we had gone belly up. That big black cloud just floated away the day we signed the acquisition."

Peach Blossoms Blowing in the Wind. EduWare's entire product line is now available through Peachtree Marketing and Distribution. Under the aegis of MSA, EduWare will be concentrating exclusively on developing educational product and interactive simulations. Their final release in the realm of interactive fantasy will appear by summer. Entitled *Merry Canned Nightmares and Dreams*, it's a family role-playing game.

All previously released interactive fantasies from EduWare, including the recently released *Armageddon* (part three of the Empire trilogy), will continue to be available. "They're like off-best Broadway shows," Steffin says. "They may get high critical acclaim, but they don't feed you."

Nowadays, Steffin is hardly worrying about where his next meal will be coming from. EduWare's acquisition enabled him to purchase a home, and he drives that Porsche—something he always wanted but could never afford before. "I was jokingly told at Softcon that I've become a folk hero in the educational community because of it."

"Beyond that, the acquisition has given me a lot more freedom financially to invest and explore," Steffin adds. Steffin feels that what he's learned developing microcomputer software will be a major asset to him in this.

"We learned a lot of things in the software business. We learned that you can't know everything and that you'd better find some experts to help you with those things you don't know. We learned the importance of marketing and how to respond to the marketplace. We learned that all of us are smarter than any one of us." ◨

Von Kronenberger: Constructing a New Life

BY MELISSA MILICH

When Gottfried R. Von Kronenberger, convicted murderer, former safecracker, and Folsom Prison inmate, was interviewed in *Softalk* in August 1981, he summed up his situation:

"Getting out of here is no problem. The problem is *staying* out."

After having served almost twelve years of a life term, Von Kronenberger was paroled on December 22, 1981. His weighty luggage, as the prison doors echoed behind him, consisted of boxes of books, a microcomputer, a printer, and several hundred floppy disks. No one had ever accused Von Kronenberger of being an ordinary prisoner.

Von Kronenberger now lives in Michigan, where he works in the construction business. His computer is used daily for inventory, accounting, job schedules, and cross-estimating expenses. Although a part of Von Kronenberger never wants to see a prison again, he is working with the Michigan State Department of Corrections to bring computers to the inmates there. The program would teach data entry to the inmates, who would in turn be hired by the state. Not only would the state cut costs in data entry, in some cases inmates would be able to repay their victims.

Each Dawn I Compute. It all started at Folsom, near Sacramento, California. There, Von Kronenberger almost single-handedly started the prison's first computer science class in the education program. He conducted a massive letter-writing campaign directed at businesses and manufacturers all over the United States asking for donations. Most computer components and instructional materials came to the prison this way; everything else was provided through the local school district. That was five years ago—there's been a waiting list for the classes ever since.

Though many believe that teaching salable skills is crucial to rehabilitation, the computer programming class at Folsom has always been the subject of controversy. Certain high-level administrators wonder about the wisdom of sticking a computer in the hands of felons.

"It's just a misunderstanding on their part," says Gary Sutherland, the principal and computer science instructor of Folsom's educational department. "A computer doesn't facilitate the gate opening or knocking a guard over. An inmate can plan an escape just as easily with a pencil and paper. People usually feel threatened when they don't know the capabilities of a computer."

Von Kronenberger puts it more bluntly: "Any time something really viable, a good alternative, gets established, it doesn't last long. I saw a lot of good things, good suggestions and ideas brought up at the prison, but they just didn't last."

Just thirty days after the original *Softalk* interview, Von Kronenberger's computer, which he kept in his cell, was confiscated in a shakedown.

"There were shakedowns constantly by the lower-echelon guards," says Von Kronenberger. In this particular one, they seized his computer even though there was a note taped to it by the associate warden authorizing Von Kronenberger to keep the machine in his cell.

Von Kronenberger pointed this out to the guard who was carting the precious computer away. "This is my cell block," growled the guard, "and I say this is a fire hazard."

The guard didn't touch a stereo and three hundred stereo tapes belonging to the inmate in the cell next to Von Kronenberger. Those were not a fire hazard.

Von Kronenberger's computer went straight to the custody officials. The associate warden who'd originally signed the authorization papers allowing the computer in the cell was on vacation, so Von Kronenberger knew he just had to wait. One thing prison taught him was patience.

When the associate warden returned and Von Kronenberger got his computer back, the monitor screen was scratched and several disks were erased.

No More Happy Hours. Ironically, the

presence of a computer in his cell helped Von Kronenberger behave well. Before he got the computer, he made bootleg brew on a most primitive but very effective still hooked up to the toilet in his cell.

"They used to call me the little old winemaker of fourth tier."

It wasn't until he got the computer that Von Kronenberger closed his still. "I walked a pretty straight line to keep that computer."

Von Kronenberger says prison life forces an inmate into doing things that tend to establish a pattern of dishonesty. While he was at Folsom, Von Kronenberger witnessed three gang-related stabbings, but like the three brass monkeys, "you don't see anything, hear anything, or say anything." Survival depends on it.

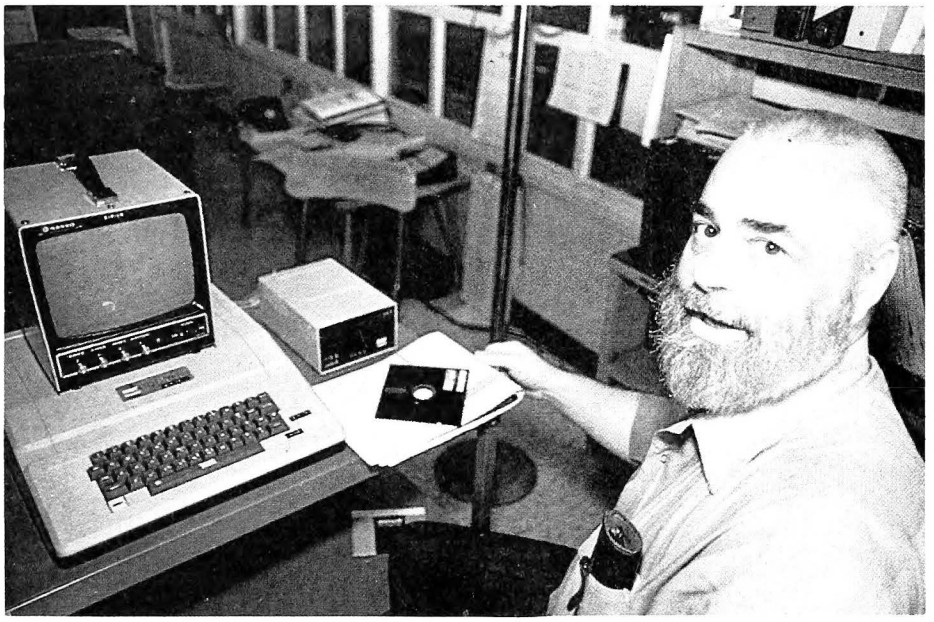
Against all the odds, the computer science program at Folsom was a success. The inmates, some of the most hardened criminals in the California State Prison system, were intimidated by the computers when they first sat at the keyboards. But these guys are no prima donnas, and once they advance to programming skills, "they literally have to be run out of the classerland says. "When they complete their coursework and receive their diplomas, for many it's their first success." The inmates are proud of those diplomas and frequently send them to relatives or hang them prominently in their cells.

People on the outside chide Sutherland that his programs sound like an awful lot of money to spend on criminals. "The rest of society doesn't have to deal with them now, but maybe four years down the line, eight years down the line, they're going to get paroled. Do you want to deal with them having nothing but the same skills they came in here with?"

The Root of the Problem. Von Kronenberger says that if people really wanted to do something, they could help instigate more social programs for juveniles. Most inmates have a juvenile record.

"If society could help them turn to something useful, school or work, before they get that first juvenile offense or immediately after they get it, that would change a lot of things."

The day he walked out of Folsom, Von Kronenberger went to a restaurant and ordered exactly what he wanted—pizza and a beer.



room," reports Sutherland.

"They'd stay here all night if they could. The computers give the inmates an environment that allows them to escape, to get away from the day-to-day drudgery of the institution; they're taking them past their criminal intellect into something positive."

"I know I can open any safe," Von Kronenberger says. "But I get as much satisfaction in the construction business. Why risk possible imprisonment, injury, or death committing a crime when you can make money doing something honest? If you can work in something you like, you're not going to steal."

Von Kronenberger believes all people in prison should be trained to make a decent wage in the street, in preparation for the day they're released.

Angels with Dirty Faces. At Folsom, many of the felons have only sixth- or seventh-grade educational skills. Many have been two- or three-time losers.

"We try to make them better people," Sutherland says. "When they complete their coursework and receive their diplomas, for many it's their first success." The inmates are proud of those diplomas and frequently send them to relatives or hang them prominently in their cells.

People on the outside chide Sutherland that his programs sound like an awful lot of money to spend on criminals. "The rest of society doesn't have to deal with them now, but maybe four years down the line, eight years down the line, they're going to get paroled. Do you want to deal with them having nothing but the same skills they came in here with?"

"You don't really get out of step. You don't forget how to act and what you like."

He was free to make a telephone call. Then he walked in a straight direction.

"In Folsom the farthest you can walk in a straight line is five hundred feet—that's around the prison track."

So he walked in a straight line through downtown Sacramento looking in the store windows seeing what was new. Except in pictures, he hadn't seen a new car in twelve years.

Nor had he seen the stars or the moon in twelve years.

"You can't even see out the window in prison," says Von Kronenberger. "A lot of things you don't miss until they're taken away from you."

And the silence. In prison, toilets rumble all night long, keys jangle at 4:00 a.m., and men cough.

Now, at night, Von Kronenberger feels the cold air and hears the silence, nothing but the silence of a clear blue sky with stars in it. ■

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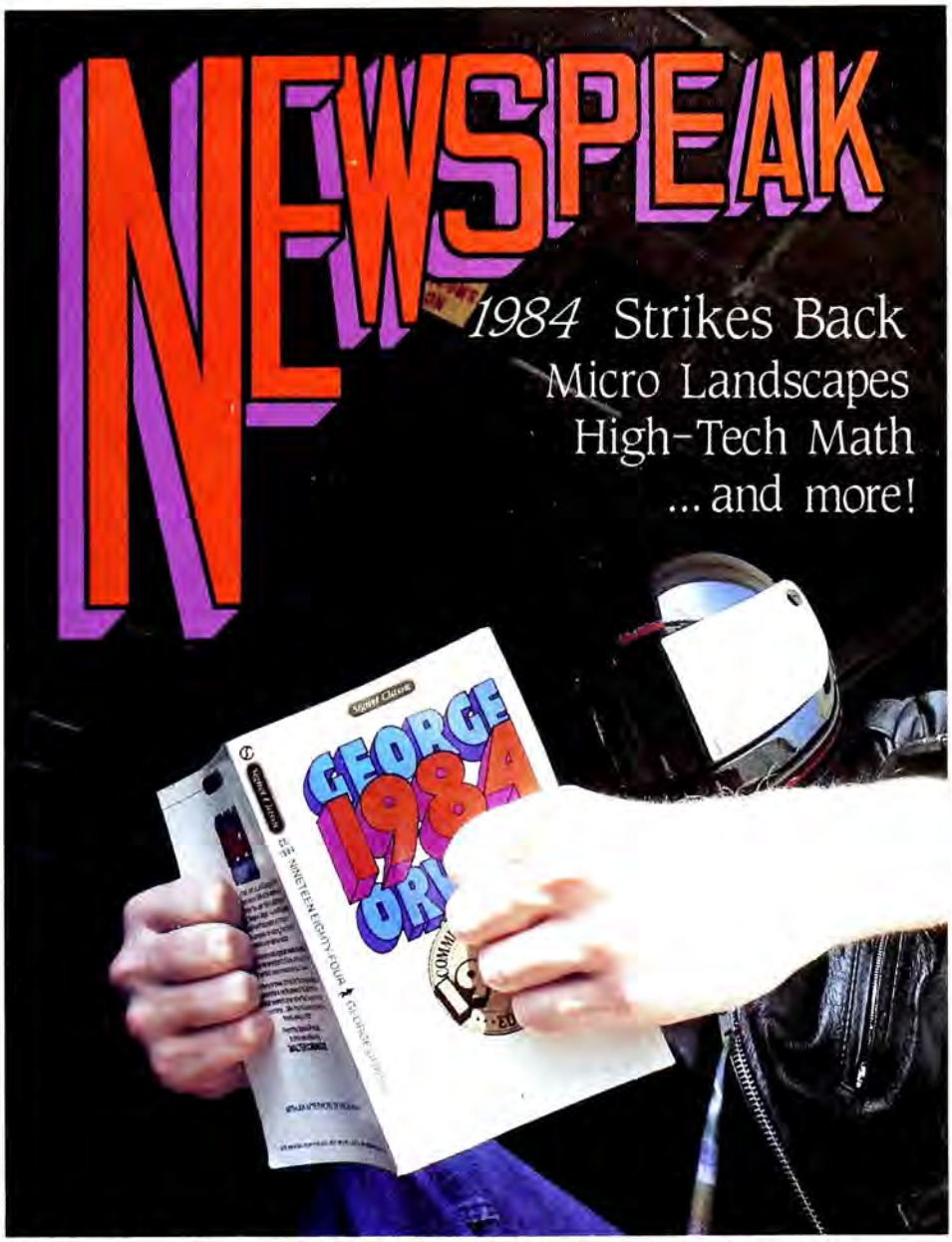
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ORWELL AND BIG BROTHER ARE BIG BUSINESS IN 1984

Is it a warning or a prophecy? Is it a truly insightful intellectual exercise or is it, as Frederic Mullally, a contemporary of George Orwell's, recently put it, a "bogus literary time bomb defused from its inception by the myopia of the author's political vision." You call it.

Now thirty-six years old, George Orwell's *Nineteen Eighty-four* (the author preferred the title written out) is probably as controversial and widely read as ever. A stark, moody novel, it is a vision of a negative utopia—with its thought police, antisex organizations, junior spies, all-seeing telescreens, and novel-writing machines. Currently, it's one of the top five bestselling paperbacks—right up there with *Lonesome Gods*, *Megatrends*, *Ascent into Hell*, *Utterly Gross Jokes*, and *The Michael Jackson Story*.

From Apple's "1984" TV commercial touting Macintosh to Van Halen's latest heavy-metal opus *1984*, the list of homages, condemnations, rip-offs, fraternal nods, and (by far the majority) shots in the dark somehow connected with Orwell and his last novel is already embarrassingly long. And that's just what has been said, written, filmed, advertised, recorded, and produced in the first two months of this year.

Few literary works have caused such a ruckus. Thirty years ago, Signet's twenty-five-cent paperback edition of *Nineteen Eighty-four* asked in bold letters on the back cover, "Which one will YOU be in the year 1984?"—proletarian, police guard, or Party member. "There won't be much choice, of course, if this book's predictions turn out to be

GOTO page 195, column 2

INDUSTRY TRIES TO FIND ITSELF IN 1984 SEASON

Spring is the season of Oscars, Opening Days, and the Fortune 500. Spring is the time for planting, flooding, cleaning, and putting the clocks ahead.

This spring, the computer industry is trying to find itself. Just as baseball managers experiment with different starting lineups and team rosters, industry executives are looking for the right combinations of talent and experience to produce winning teams (that in turn produce winning products). At the same time, there is a panicky feeling throughout the industry. Many manufacturers are struggling. Software publishers are either desperately spending huge amounts of money or desperately peering into crystal balls.

Deep down, everybody in the industry still believes that micros are the hottest thing since color TV. And everybody wants a piece of the predicted millions that will be made later this decade. The problem is surviving until that pie is cooked and ready to be divvied up.

What follows are facts, rumors, updates, obituaries, and the general scuttlebutt about the computer industry—a kind of "Computers Illustrated Preview of the Coming Season." Make your bets and buy an extra-large popcorn: The game has just begun.

Facts: IBM plans to sell $1.2 billion worth of personal computers in 1984 (the company sold $700 million worth in 1983); Apple would like to sell a million Macintoshes (that's roughly a ten-figure clam-and-a-half in sales); AT&T is hungry and on the move, threatening to enter the personal computer market sometime this year (Ma Bell posted a $4.87 billion loss in the last three quarters of 1983, more than four times the previous record).

Fact: On February 16, 1983, IBM announced the IBM Portable Personal Computer—an 8088-based machine with 256K and one disk drive. Priced cheaper than the Compaq PC look-alike, the IBM Portable PC is bound to cause some headaches for Compaq Computer and Kaypro.

Scuttlebutt: IBM dropped its suit against National Semiconductor in favor of an out-of-court settlement and then promptly sued Corona Data Systems for producing a PC-compatible computer that is too close to the original.

Fact: Earlier this year, AT&T bought a 25 percent interest in Olivetti, the Italian manufacturer of office equipment, for about $260 million. AT&T also is engaged in cooperative ventures with Philips of Holland, Wang Laboratories, Digital Research, and Convergent Technologies.

Rumor: According to some people's figures, it costs $8 million to develop a monster software hit, such as *1-2-3* or *WordStar*, that will pull in more than thirty million at the

GOTO page 196, column 2

Colorful Glimpses of Microscopic Landscapes

High-Tech Photography Exhibit Tours US

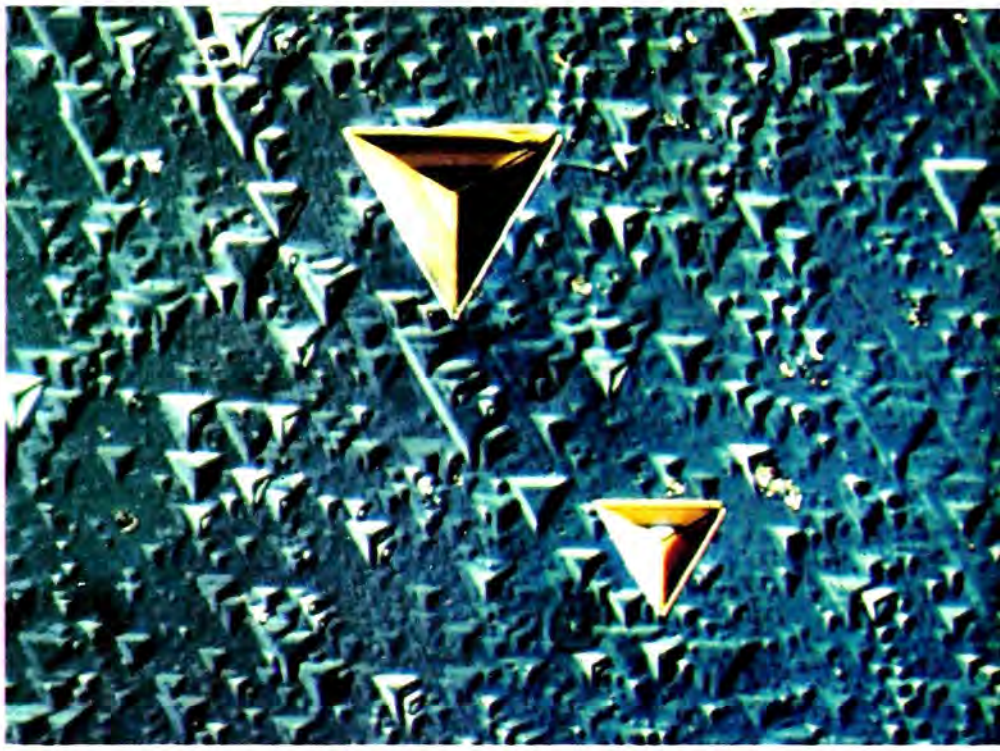
A fascinating exhibit of forty-seven photographs, called MicroScapes: The Hidden Art of High Technology, is currently making a two-year multicity tour of the United States. Mounted by AT&T Technologies, the exhibit represents some of the current processes used by AT&T in the research, development, and production of advanced communications systems.

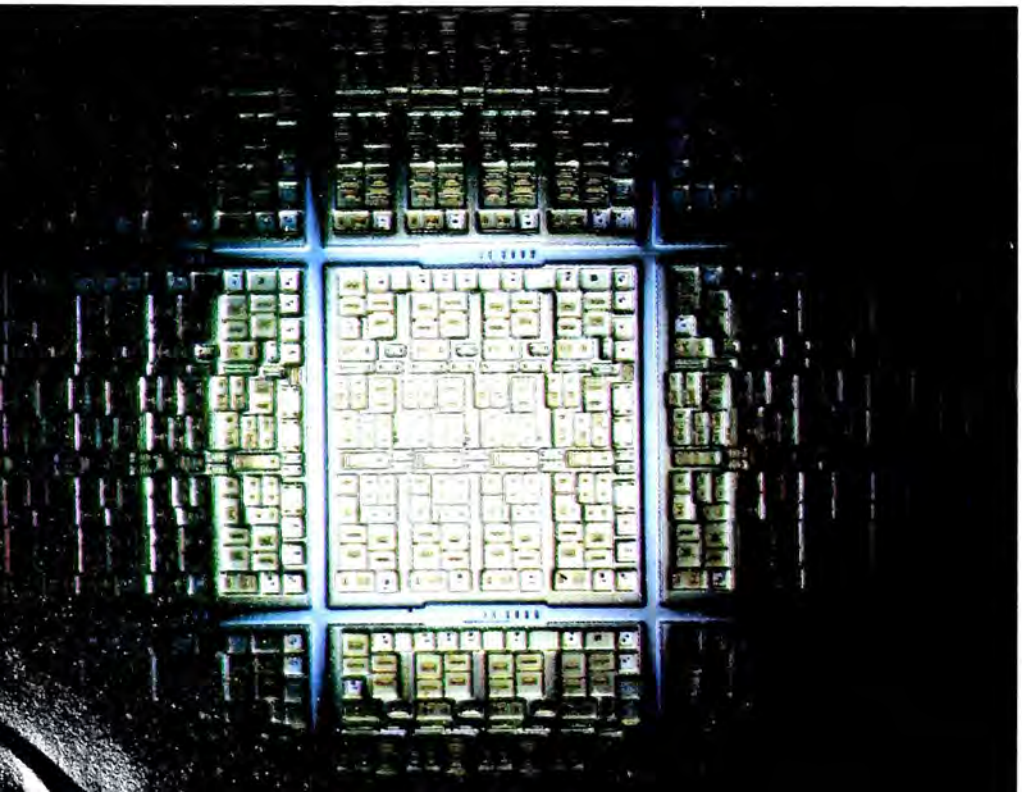
The large-format color and black-and-white photos in the exhibit employ such advanced photographic techniques as photomacrography, photomicrography, interferometry, thermography, and light polarization. These state-of-the-art techniques—some of the photos were shot at exposure speeds of 1/720,000th of a second and with magnifications of 67,000 times the actual image size—reveal eerie and colorful landscapes that are hidden from the naked eye.

High-technology manufacturing processes such as electrode deposition of gold and copper, silicon irradiation by laser, plasma etching of silicon wafers, and the joining of materials by explosive bonding are dramatically pictured. The extremely close-up photos of microprocessor chips, glass fibers, crystals, and magnetic bubbles begin to resemble fine art.

Photomacrography is a process by which moderately magnified pictures—generally two to twenty-five times original size—of small subjects are made. Optical photomicrography, through the use of a compound microscope, greatly magnifies minute subjects.

Two electron microscope processes are represented in MicroScapes. In scanning electron photomicrography a narrow beam of electrons scans the exterior surface of an object to produce an image that appears dimensional. In transmission electron micrography an electron beam penetrates a thin sample of an object, projecting a shadow image that is recorded on photographic film.





Above: Vaporization pits on arsenic single-crystal surface, photomicrograph by Clifton Draper, enhanced with Normarski differential interference contrast; below, gated crosspoint diodes; photomacrograph by Charles Lewis using fiber optic- and epi-illumination.

Interferometry is a technique by which to visualize invisible density variations in a disturbed medium. It involves splitting a light source into two beams, then recombining them on film.

Thermography is a technique for imaging variations in the amount of infrared radiation, or heat, emitted by a subject. Light polarization is used to differentiate between portions of subjects of varying thickness or optical density.

In addition to photographs, MicroScapes features a number of freestanding, interactive displays—including a one-half-inch-square Western Electric 256K RAM chip containing more than six hundred thousand individual components.

MicroScapes finishes up a week-and-a-half stint at Baltimore's Maryland Science Center on April 1. The show then moves to Indi-

GOTO page 194, column 1

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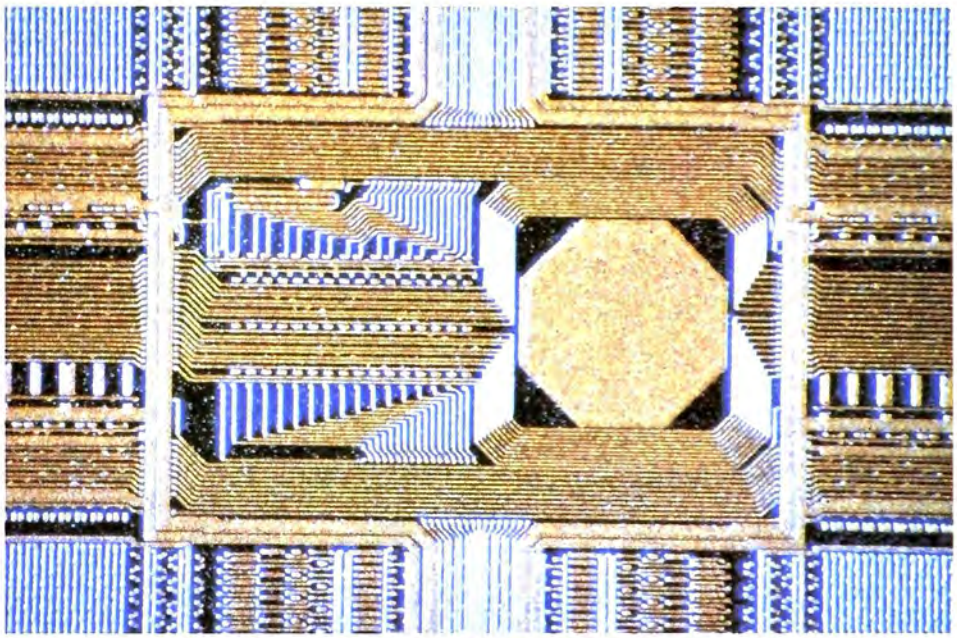
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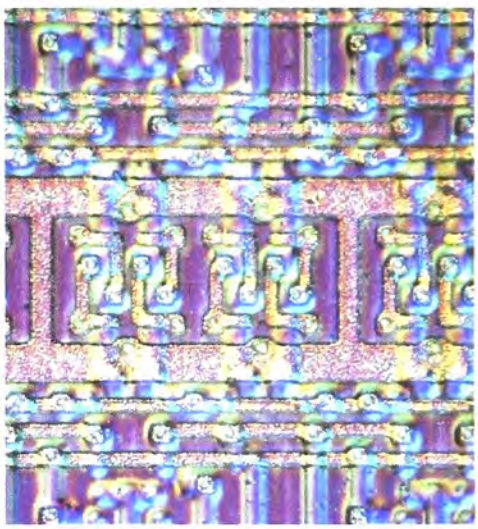
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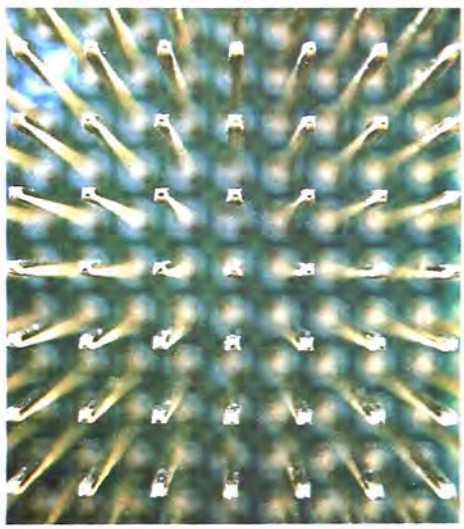
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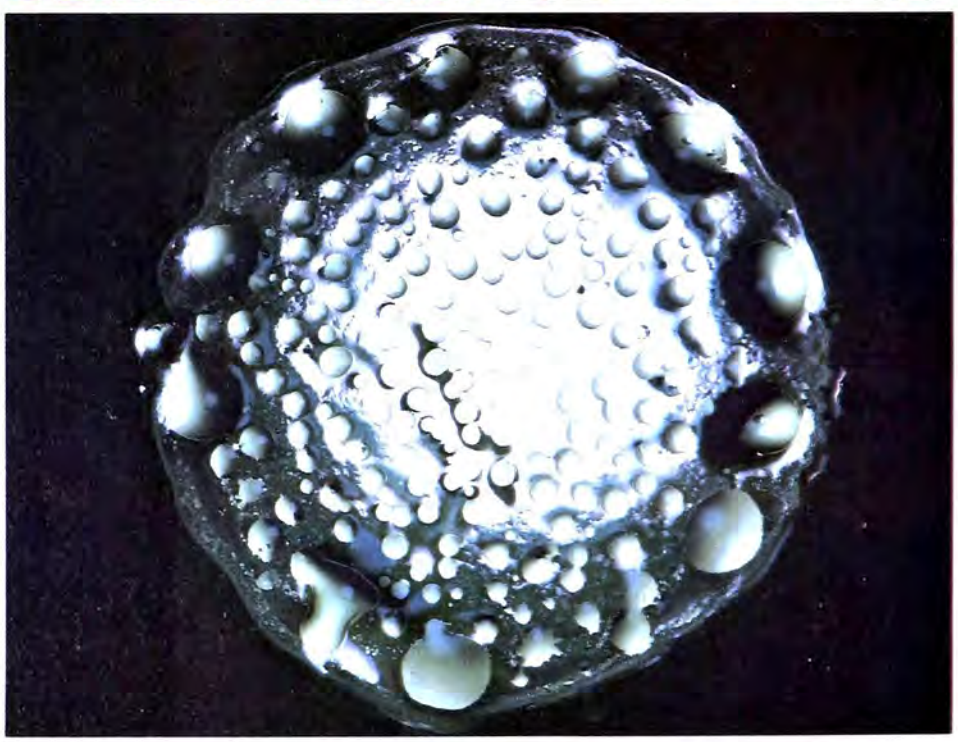
anapolis and the Children's Museum, where it runs April 21–June 3. Four other cities are currently on the docket: Fort Lauderdale, Florida, June 23–August 5; Oklahoma City, August 25–October 7; Atlanta, November 3–December 16; and Reading, Pennsylvania, May 11–June 23, 1985.

For more information contact the Association of Science-Technology Centers in Washington, D.C.









Clockwise from top: Surface of a 256 RAM chip magnified a thousand times, photomicrograph by Phillip Harrington using fiber optic illumination; connector pins of a plug-in circuit magnified about twenty times (photomacrograph by Charles Lewis); copper mirror test for soldering flux corrosion (photomacrograph by Charles Lewis); storage cells in dynamic random access memory chip magnified about five thousand times (photomicrograph by Phillip Harrington).

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Cash Award for Math Programs Is Announced

A $100,000 prize donated by the Fredkin Foundation of Cambridge, Massachusetts, awaits anyone who can design a computer program capable of making a significant mathematical discovery. The prize will be awarded "for a mathematical work of distinction in which some of the pivotal ideas have been found automatically by a computer program in which they were not initially implicit," according to a statement from a committee of mathematicians and computer scientists who are defining the rules for the competition.

Sounds easy, right? Don't bet on it. The creators of one of the most sophisticated programs to date, *Bacon*, believe it will be ten to twenty years before anyone will win the prize.

One difficulty facing programmers is that a candidate program must come up with an original theorem and proof without "coaching" from humans. On its own, the program must discover a theorem that other mathematicians agree is a major new result.

Currently, more than a few research groups are developing "automated theorem-proving" programs. Although great progress has been made with these programs, they still lag behind human capabilities. Programs like *AM* (automated mathematics), created by Douglas B. Lenat at Stanford University, and *Aura*, developed at the Argonne National Laboratory in Illinois, are formulating new mathematical ideas and solving previously unsolved problems in advanced mathematics. *Bacon*, created by Herbert A. Simon and Patrick Langley of Carnegie-Mellon University, can generate conjectures from patterns and relationships it discovers within data and has already rediscovered Kepler's laws of planetary motion and Snell's law for the refraction of light.

It is hoped that the $100,000 prize (which may double or triple in size because of accumulated interest, depending on how soon someone wins it) will encourage more mathematicians to use computers in mathematical research.

Woodrow W. Bledsoe of the math department at the University of Texas at Austin is chairman of the rules-making committee. A computer enthusiast, Bledsoe wants to see computers used more in mathematical research. "We want to see if we can make computers act like humans. We want them to be able to reason," he says.

"I think the winner will be the person who is knowledgeable in both computer science and mathematics," says Bledsoe. "And it probably won't be someone we've never heard of." The full criteria for winning the prize will be published soon, says Bledsoe, adding that he doesn't expect to receive any serious candidates for quite a while.

The committee is also considering the idea of an additional prize for a computer program that can take a tough mathematics examination and do better than its human competitors. The Fredkin Foundation has a $100,000 prize ready for the first computer chess program to become the world chess champion. (Recently the foundation awarded $5,000 to Kenneth Thompson and Joseph Condon of AT&T Bell Laboratories for Belle, the first computer system to achieve a Master rating in tournament play.

The Fredkin Foundation was established by Edward Fredkin, a professor at the Massachusetts Institute of Technology. DH, MS

Orwell

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true." The blurb typifies the attitude toward the book in the fifties. Anti-Communist sentiment was at its peak, and the ruling Party in *Nineteen Eighty-four*, with its figurehead Big Brother, were considered synonymous with Stalinism and the U.S.S.R.

1984 has been a kind of nagging doubt in the conscience of the West for the last three decades. Ironically, Orwell originally planned to call the book *The Last Man on Earth* and eventually felt that he had ruined the original good idea for the story. But Orwell (his real name was Eric Blair) was always pessimistic about his own writing.

Now, in the dreaded year itself, the book is perceived by many as a long-term warning. Some see the computer revolution, with the promise/threat of such things as two-way videotex and artificial intelligence, as close to reaching Orwell's totalitarian standards. Others see the current massacre of the English language in advertising and politics as evidence that Newspeak—the official language/thought process of the Party in *Nineteen Eighty-four*—is alive and well in the world. And others, like Mullally, say Orwell was a bitter, dying man who botched it.

Confused as everybody seems to be about it, *Nineteen Eighty-four* is nevertheless a hot item. There are still eight months left in the year, and it's a sure bet that we're in for more Orwellian revelry.

Herewith, then, is a brief rundown of recent events, new and forthcoming publications, and future happenings that are somehow related to Orwell. If anyone invites you to an "April 4 Party" or to join the Urban Anti-Sex League, at least you'll be somewhat prepared.

In addition to writing the preface to Signet's "Commemorative" edition of *Nineteen Eighty-four*, Walter Cronkite narrated "1984 Revisited," a sixty-minute CBS documentary aired last June. In the preface to the new paperback edition, Cronkite calls *Nineteen Eighty-four* "a novelistic essay on power" and "an anguished lament." He identifies Big Brother with Stalin, Hitler, and Khomeini and identifies Newspeak with the "dehumanizing babble of bureaucracies and computer programs." Cronkite's conclusion? The book is a warning, and "1984 may not arrive on time, but there's always 1985."

National Public Radio is offering "Will Next Year Be '1984'?"—a thirty-minute cassette of a four-part series comparing Orwell's *Nineteen Eighty-four* with the real 1984.

A seventeen-volume edition of Orwell's complete works will be published this year in England and this country. In addition, the BBC is brewing a whole stew's worth of tributes, dramatizations, and documentaries about Orwell and his works. Orwell worked for years as a BBC broadcaster, before and during World War II. Fittingly, a wax figure of Orwell was installed at Madame Tussaud's in London this past December.

This spring, production has begun on a new film version of *Nineteen Eighty-four*, directed by Michael Radford (*Another Time, Another Place*). The original film adaptation of the book was released in 1956, with Edmund O'Brien portraying the protagonist, Winston Smith. Three years ago, Marvin Rosenblum, a Chicago lawyer, bought the film rights from Orwell's widow. Apparently somewhat obsessed with making the movie, Rosenblum spent a long time trying to get Hollywood and directors like Hal Ashby, Milos Forman, and Francis Coppola interested in the project. Now Rosenblum is in partnership with British producer Simon Perry and Virgin Pictures, which will provide financing.

This year, Jura—an island in the Hebrides, west of the Scottish coast—is expecting increased tourism because Orwell lived there while writing *Nineteen Eighty-four*. Orwell's island residence, a dismal old manor called Barnhill, is still standing. Jura is usually portrayed as a bleak, chilly, damp place; even so, a minor horde is expected to descend there to try to uncover some of *Nineteen Eighty-four*'s roots.

Two Michigan State graduates have come up with the "1984 Calendar," billed as a day-by-day history of the increasing erosion of civil liberties in the U.S. It features black-and-white photographs of U.S. Government buildings (IRS, FBI, and the Bureau of Indian Affairs) and of police riot squads and jail cells. Each date is annotated with one or more reminders of the loss of freedom. For instance, on August 1, 1973, the *Washington Post* reported a private investigation launched by the Nixon White House on the Smothers Brothers.

Much has been written in the editorial sections of newspapers about Orwell and his work, and at least two books directly related to *Nineteen Eighty-four* have been published so far this year. *1984 and Beyond*, by Nigel Calder (Viking), is written in a bizarre, question-and-answer format. O'Brien, the villainous Party member in Orwell's novel, is embodied in an all-knowing computer that the author interrogates. The book summarizes the

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Orwell

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predictions made by noted authorities in 1964 about what this year would be like and grades their performances. *1984 Revisited*, edited by Irving Howe (Harper and Row), is a scholarly collection of thirteen essays by various authors. The volume has as many viewpoints as authors—some essayists argue for a revived Cold War to contain the U.S.S.R., while others argue that the totalitarianism evident in the world today is nothing like the Ingsoc (English Socialism) of Orwell's Oceania.

One of the more ambitious Orwellian events took place the morning of January 1. A select group of artists gathered in Paris and New York for a multimedia artistic exchange via satellite TV. *Good Morning, Mr. Orwell* was arranged by video director Nam June Paik, who calls Orwell "the first media philosopher, the first communications prophet." The hour-long show, broadcast live simultaneously in both New York and Paris, featured poet Allen Ginsberg, musicians Laurie Anderson, Peter Gabriel, Oingo Boingo, Philip Glass, and John Cage, choreographer Merce Cunningham, all-around guru Salvador Dali, and performance artist Pierre-Alain Hubert. *Good Morning, Mr. Orwell* was fairly successful at demonstrating that TV and technology have not brought about Orwell's grim visions of media totalitarianism.

If nothing else, Orwell wrote probably the most famous post-nuclear-war novel to date in *Nineteen Eighty-four*. The dusty, smoky hall and pathetic appearance of the proles (proletariats) in Apple's Macintosh commercial are Orwell's visions of postwar London taken even further. Apple's $500,000 commercial, directed by Ridley Scott (*Alien* and *Blade Runner*), falls somewhere between an homage and a fraternal nod. Many chose to identify the menacing Big Brother figure in the advertisement as IBM. The ad, which ran the week before Apple officially announced Macintosh, ends with the message that Apple's new computer will help everyone see why "1984 won't be like *1984*."

Nineteen Eighty-four is a bitter meal, strong food for thought. Read it. And, if you're a glutton for punishment, there's a rich body of utopian and dystopian literature that is often ignored in favor of Orwell. Some of the best works are *The Iron Heel*, by Jack London; *The Futurological Congress*, by Stanislaw Lem; *Looking Backward*, by Edward Bellamy; *War with the Newts*, by Karel Capek; *Anthem*, by Ayn Rand; *The Lomokome Papers*, by Herman Wouk; *It Couldn't Happen Here*, by Sinclair Lewis; *Men Like Gods*, by H.G. Wells; *We*, by Evgenii Zamiatin; *Stand on Zanzibar*, *The Sheep Look Up*, and *The Jagged Orbit*, by John Brunner; *Brave New World* and *Brave New World Revisited*, by Aldous Huxley; and *1985*, by Anthony Burgess.

It was on April 4, 1984, that Winston Smith started writing a diary at the beginning of Orwell's novel. This forbidden act on Smith's part is indicative of how Orwell felt about the repressive society he envisioned. Nothing could be more horrible to imagine than a world where an individual could not write down on paper opinions or anything else personal. Smith is terrified when he sees that he's written, almost without thinking, "Down with Big Brother."

It's worth recalling that, on the real April 4, 1984, some of us (in this country, at least) are not afraid to write "Down with Big Brother" on the most prominent billboard we can find.

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Industry

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box office.

Scuttlebutt: Lotus's Mitch Kapor, speaking in New Orleans at Softcon, had this to say about the coming shakeout in software: "Competition is forcing a shakeout, yes; but companies aren't going to explode in flames like the Hindenburg, or go under like the Titanic. They're more like the ships of Magellan's fleet. Some will make it around the globe; others will lose their way and sink almost without a sound."

Update: Coleco recently admitted to manufacturing only 95,000 Adam home computers in 1983. Last year, the company said it would ship at least 400,000 Adams before the new year. In December, J.C. Penney announced that the Adam did not meet the retailer's "quality standards" and decided to cancel catalog orders for the machines (the retail chain stopped selling home computers altogether on February 1). Undaunted, Coleco has announced that in June it plans to introduce a line of telephones aimed at the teenage market.

Update: Commodore's founder Jack Tramiel resigned in mid-January, and the company chose Marshall F. Smith as its new president and chief executive officer. Smith's background is manufacturing and corporate finance, and he's an old buddy of Commodore chairman Irving Gould.

Obit: Texas Instruments was thoroughly thrashed by a $660-million loss in its discontinued home computer line and closed fiscal 1983 with an overall loss of $145.5 million on total sales of $4.58 billion. The semiconductor division of the company saved the day somewhat.

Obit: Mattel, battered by losses in its video game and home computer businesses, is selling off all its divisions and planning to concentrate on its profitable toy and hobby departments. Mattel Electronics (now Intellivision Incorporated), which lost $283.5 million in the first three months of fiscal 1983, was purchased by Mattel executive Terrence E. Valeski and two backers, Ike Perlmutter and Bernard Marden—who together own New York-based Odd Lot Trading, a firm specializing in closeout merchandise. Valeski says he can make Intellivision a success. Mattel has also bid adieu to its Monogram Models and Western Publishing subsidiaries.

More obits: Victor Technologies has filed for reorganization under Chapter 11 of the federal bankruptcy code, even though its Victor 9000 personal computer has won praise for its technological capabilities. The company owes $110 million to creditors. Timex, producer of the popular Timex/Sinclair 1000 home computer, has announced that it will halt the sale of home computers. Two units introduced by the firm last year did not sell well.

More facts: Storage Technology has ceased its two-year-plus efforts to market its own mainframe and laid off four hundred workers. At the core of the problem is IBM's aggressive pricing in the mainframe market. Tandon, a disk drive manufacturer, laid off 400 of its 3,100 U.S. workers. The company has had increased earnings and is in the process of shifting its assembly operations to low-wage Singapore and India.

Rumor: The Japanese are coming.

Conclusions: Casey struck out; it took Hank Aaron twenty-one years to beat Babe Ruth's home-run record; and Billy Martin is alive and well and not managing the New York Yankees.

Final conclusion: Some players will strike out and some will hit home runs, but no player owns the baseballs.

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☐ **Heavy Metal Motor City Bash.** The NCC/COMDEX/CES of robotics shows, Robots 8, will be held June 4–7 at Cobo Hall in Detroit, Michigan. Sponsored by the Robot Institute of America and Robotics International of the Society of Manufacturing Engineers, Robots 8 should attract some two hundred different industrial robots, demonstrating applications for assembly, finishing, painting, welding, machine loading, material handling, quality control, break-dancing (just kidding). Conference subjects include applications, systems, safety, human factors, theory, research, and education. For more information on the exposition/conference contact the Robotics Institute of America in Dearborn, Michigan.

☐ **10,000 Lakes and Computer Graphics.** SIGGRAPH '84—the Eleventh Annual Conference on Computer Graphics and Interactive Techniques of the Association for Computing Machinery's Special Interest Group on Computer Graphics—is slated to run July 23–27 in Minneapolis, Minnesota. Expected to draw sixteen thousand to twenty thousand computer graphics professionals, SIGGRAPH '84 will feature up to thirty one- or two-day courses, numerous technical paper presentations, a larger-than-ever exhibition of graphic wares, a design arts show, film and video presentations, and the premiere of the first totally computer-generated Omnimax film. Solid modeling, raster graphics, image synthesis, bit-map graphics, and free-form surfaces are just a sampling of topics that will be covered in the courses. For more information contact the SIGGRAPH '84 conference office in Chicago, Illinois.

☐ **DARPA Chips In.** College students studying design and architecture of integrated-circuit chips—particularly VLSI (very large scale integration) projects—will be able to have chips they design manufactured free of charge at the Defense Advanced Research Projects Agency (DARPA) VLSI fabrication center. The program is restricted to U.S. universities, and applications to use the facility are made through the National Science Foundation in Washington, D.C. The idea is to accelerate the "professional learning cycle" by giving undergraduates and graduate students access to the type of state-of-the-art facility they would not ordinarily encounter outside of private industry. Reportedly, once chip-design instructions are relayed to the DARPA center on one of three telecommunications networks, usually no more than three or four weeks elapse before the completed chips are received.

☐ **Intellivision 3-D—Just When You Thought It Was Safe To Play Video Games Again.** A research engineer at the Georgia Institute of Technology in Atlanta, Richard Steenblik, has developed a new process for conveying three-dimensional depth to computer-generated images. In January, Georgia Tech applied for a patent on Steenblik's process. The details of his process are still secret. It is apparently simple in design, but still requires viewers to wear special glasses similar to those needed to watch 3-D movies. The difference, reportedly, between Steenblik's 3-D scheme and the more familiar anaglyph process—wherein stereo vision is achieved by using two superimposed images, one for each eye—is that only one image is displayed. A toned-down version of the process will be unveiled later this year when Intellivision Incorporated (formerly Mattel Electronics)—the first licensee—begins marketing a 3-D video game for its Intellivision unit. In the game *Hover Force 3-D*, a single, maximum-discernible depth is preset by the glasses' fixed lenses. More sophisticated versions of Steenblik's process will use glasses that permit viewers literally to dial the degree of depth desirable. Steenblik says his process will work with just about all current computer graphics equipment and is capable of producing both color and black-and-white graphics.

☐ **Manufacturing Minds.** "The Computer: Mind of the Factory of the Future" is the theme of the Advanced Manufacturing Systems Exposition and Conference (AMS '84) to be held at McCormick Place in Chicago June 12–14. Information systems and automated production systems for manufacturing will be demonstrated, with more than sixty conference sessions scheduled. Four all-day courses will focus on robotics and personal computers in managerial work. Running concurrently at the same location will be Info/Software: The Information Management Exposition and Conference for Software. All types of software will be shown, from micro to mainframe. For further information, contact the AMS '84 office in New York City.

☐ **Ace of Space.** Don Bluth, creator of the industry-reviving videodisc/arcade game *Dragon's Lair*, has come out with a new animated coin-op offering. The game features fourteen minutes of animation—in the same rich style of *Dragon's Lair* and Bluth's 1982 animated feature *The Secret of NIMH*. It's called *Space Ace* and the names of the characters are different—Ace and Kimberly, not Dirk the Daring and Daphne—but the scenario is old hat. Hero/boyfriend Ace must rescue his damsel in distress, while dealing with all kinds of nasty creatures. The big change is that Ace uses a ray gun, not a sword. The animation for *Space Ace* cost $1.8 million to create, up from the $1.3 million it cost to make the twelve animated minutes of *Dragon's Lair*. Bluth and his studio are currently working on *Dragon's Lair II*, which has an animation budget of $2.3 million. *Dragon's Lair* has grossed more than $32 million and has spawned a home version (due out soon from Coleco). Bluth is reportedly preparing a feature film based on the exploits of Dirk and Daphne, and ABC may introduce a weekly series based on the game. Also, CBS has expressed interest in a series based on *Space Ace*, which sold fifteen hundred arcade machines in its first week on the market. To date, *Dragon's Lair* has sold more than eight thousand units.

☐ **The Razor's Edge.** Best known for his studies of space habitats, Gerard K. O'Neill has written a new book. Published by Simon and Schuster, it's called *The Technology Edge*. O'Neill's book explores America's possible economic future, looking closely at what he calls the six major technological opportunities of our time. Three of the six areas O'Neill writes about—robotics, microengineering, and genetic hardware—are worldwide industries. In all three, O'Neill sees Japan having distinct advantages over the U.S. in the long run. He condemns the mistakes of American "money managers ignorant of technology, indifferent to building strong management-worker cooperation, and excessively focused on short-range profits." The other three areas—magnetic flight, personal airplanes, and space technology—are a grab bag, with the U.S. still leading the pack in space. O'Neill emphasizes that the U.S. may be growing cold intellectually at the time of its greatest successes. We have "glorified the merger and the takeover as if our industry were a nationwide board game." O'Neill's proposal is to let low-tech industries (autos, oil, steel) decline and concentrate on the six crucial areas. Four centuries ago, the development of the New World required invention of the corporation. O'Neill posits that we may need to find some new mix of government, capital, and labor to do the trick this time.

☐ **Build a Butler?** Hobby Robot, based in Hazlehurst, Georgia, offers the Smart Rabbit, a household robot that is plug-compatible with the Timex/Sinclair and Commodore series of computers. The company claims that Smart Rabbit is the "only household robot with upgradable, transportable electronics and software to a full-size, man-rated domestic robot." (What's a man-rated domestic robot?) Right now, Smart Rabbit does not do much besides accept Basic programming and move around via an onboard motor, and wave its arms. The manufacturers say that soon the Smart Rabbit will have speech recognition and synthesis capabilities, ultrasonic and infrared sensors, arms, and a modem.

☐ **Wookie Bait.** Ropet is a personal robot that doesn't require an external computer for operation. Marketed by Personal Robotics Corporation, based in San Jose, California, Ropet uses a Z-80 processor and S-100 bus. Plug-in cartridges provide programs for security, entertainment, and education. External communications are available for connecting Ropet to a development station. Ropet is mobile and can avoid collisions as well as obey spoken commands. ■

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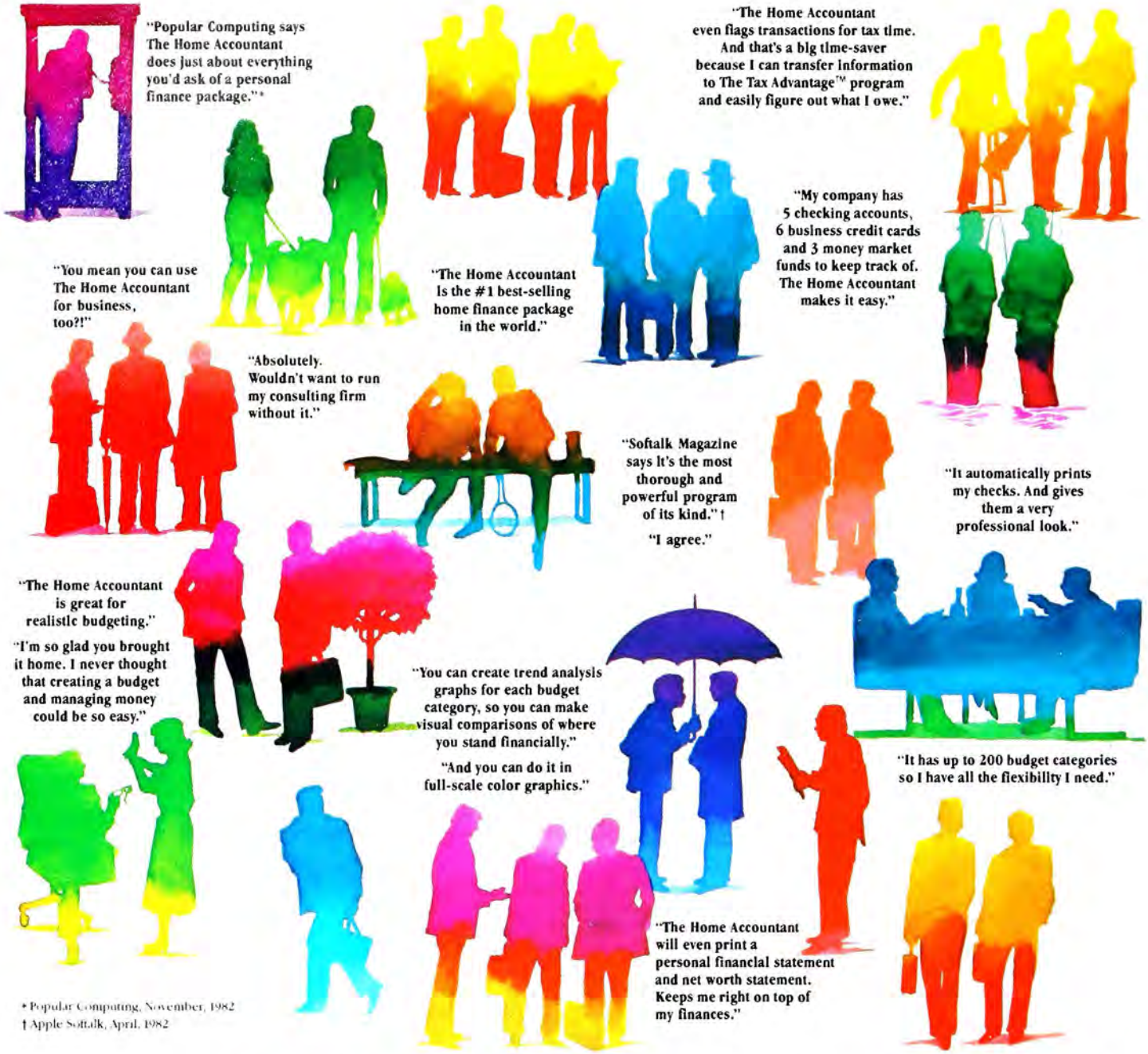
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FASTALK

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.

A new software entry, which must be of professional quality to be included, is designated by a check mark preceding its name. A new entry loses its check mark after its first appearance and drops out of Fastalk after one to three appearances (depending on genre) if it fails to gain popularity.

A bullet preceding a title indicates a program that *Softalk* has designated as a classic, based on its ability to stand up over time, its significance for its time (breaking new ground or introducing a new genre), or its archetypal qualities.

Other entries in Fastalk are there either by virtue of current activity (the programs are selling at least as much as the least-selling entry on any of the bestseller charts) or because they are representative of the best of programs for a special interest or need (such as card games or non-Basic-specific language terminal programs).

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.*

• **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.*

The Dark Crystal. Williams. Hi-res adaptation of fantasy movie. New puzzles challenge even those who've seen the movie. Sierra On-Line, Sierra On-Line Building, Coarsegold, CA 93614. $39.95. *4/83.*

Deadline. Blank, Lebling. Episode one in a series of murder mysteries by the authors of *Zork*. 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.*

Escape from Traam. Pearson, Sailer. You crash on a world no human has seen. Its strange beauty hides danger that makes escape imperative. Adventure International, Box 3435, Longwood, FL 32750. $29.95.

• **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.*

Philistine Ploy. Aaron, Rosenbaum. Good Biblical graphic adventure based on the Book of Judges features more than 80 screens, some animation. Knowledge of the Bible not necessary to solve. Davka, 845 N. Michigan Ave., #843, Chicago, IL 60611. $34.95. *12/83.*

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, Edu-Ware. 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.*

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. *6/81.*

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

BPI General Accounting. Performs like *General Ledger*. Print 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.

The Incredible Jack. Word processor, database, and spreadsheet, plus mailing label print and sort. Gives 80-column u/lc display automatically on the IIe, with 64K, 80-column card on the II Plus. Business Solutions, 60 E. Main St., Kings Park, NY 11754. $129. *8/82.*

Multiplan. Easy-to-learn electronic work sheet 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 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.

Risk Simulator. Estimates probability distributions related to risk situations, such as automobile maintenance expenses or employer funding of health benefits. Actuarial Microcomputer Software, 3915

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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.

• **VisiCalc.** Bricklin, Frankston, Software Arts. Electronic work sheet 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.

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.

Z-Term: The Professional. More than an update. Compatible with a great variety of modems, interface cards, and screen modes. Simple file transfer with integrity. United Software Industries, 1880 Century Pk. E., Los Angeles, CA 90067. $149.95. *5/81.*

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.*

• **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.*

Wiziprint. Character printout utility records known spells, attributes, and gold. Compatible with all scenarios. Sir-tech, 6 Main St., Ogdensburg, NY 13669. $24.95.

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.

Coloring Series 1. Thornburg. On-disk coloring book for KoalaPad contains 25 geometric designs, includes manual with background on pattern creation. Koala Technologies, 3100 Patrick Henry Dr., Santa Clara, CA 95050. $29.95. *12/83.*

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.*

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., #106, Denver, CO 80203. $75. *7/83.*

The Graphics Magician. Jochumson, Lubar, Pelczarski. Outstanding animation package consisting

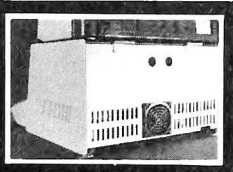
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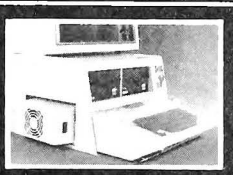


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The APPLE-CENTER Model 12 protects your Apple system from theft and unauthorized use. All metal construction, the APPLE-CENTER bolts easily to a table-top, securing your Apple II or IIe, 2 disk drives and your monitor. Unlocked, the APPLE-CENTER opens up to allow you quick and easy access inside your Apple. The key switches power to your Apple system and the filtered cooling fan. The SURGE SENTRY, by RKS Industries, protects your Apple from harmful voltage spikes.



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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.*

• **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.*

Pixit. Darooge. Easily manipulate and combine shapes. Helps you build and modify Applesoft shape tables and use them in programs. Listable. Baudville, 1001 Medical Park Dr. S.E., Grand Rapids, MI 49506. $49.95. *1/84.*

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, 830 4th Ave., 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

• **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.

The Eating Machine. Thorne. System designed to teach the analysis and planning of meals. Uses bar graphs and happy faces to gauge your calorie, vitamin, mineral intake and to show what percentage of total calories came from various food groups. Crude graphics, good documentation. Muse Software, 347 N. Charles St., Baltimore, MD 21201. $49.95. *1/84.*

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.*

✓ **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.*

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 pari-mutuel 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.*

Songwriter. Bardige, Wantman. Fun, easy-to-use music-creation program teaches musical concepts but doesn't use standard notation, cannot produce harmonies. Good for beginners. Scarborough Systems, 25 N. Broadway, Tarrytown, NY 10591. $59.95. *2/84.*

✓ **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 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.*

The Arcade Machine. Jochumson, Carlston. Step-by-step arcade-game designer—shapes, scoring, sound, and titles. Begin with variations on five games included, then on to your own. Broderbund, 17 Paul Dr., San Rafael, CA 94903. $59.95. *11/82.*

Bandits. Ngo. Fight off waves of multiple menaces intent on stealing your supplies. Delirious nonstop action, animated to the hilt. Sirius, 10364 Rockingham Dr., Sacramento, CA 95827. $34.95. *7/82.*

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.*

Cavern Creatures. Lowrance. Avoid cavern-dwelling snakes and monsters in your fast, maneuverable ship just to slam into a cavern wall or run out of fuel. Good joystick control. Has its faults. Datamost, 8943 Fullbright Ave., Chatsworth, CA 91311. $29.95. *1/84.*

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.

• **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.*

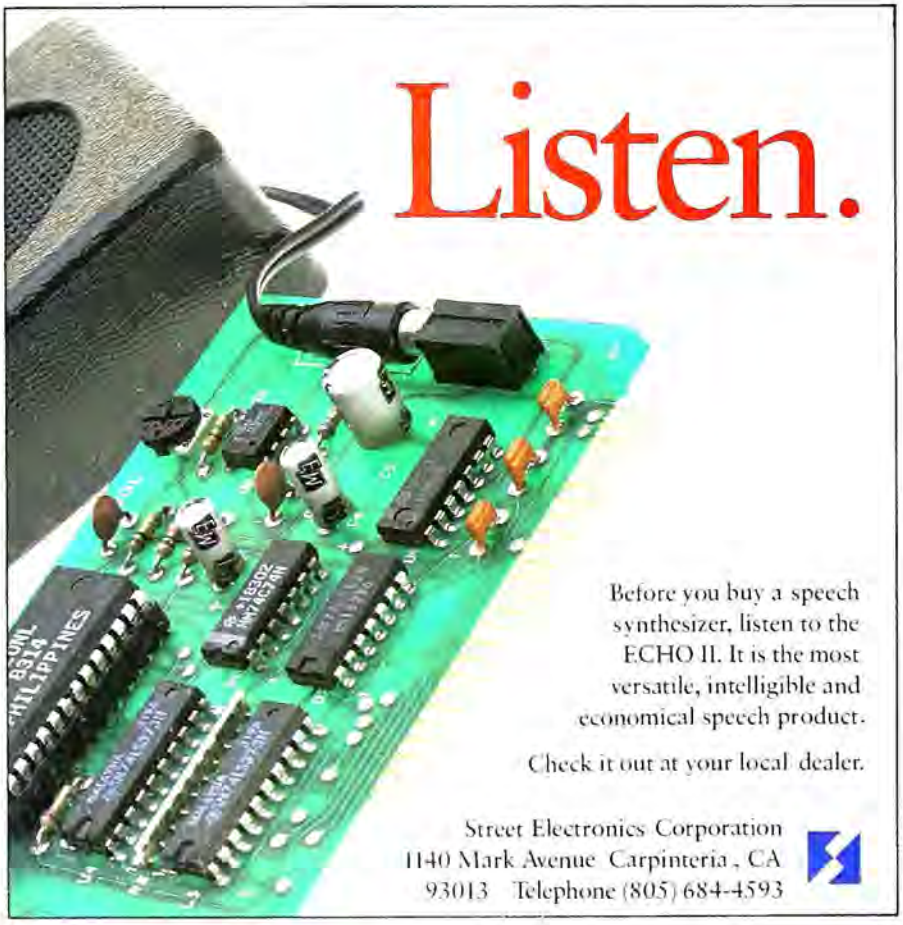
• **Crossfire.** Sullivan. Critters come at you from four directions on a grid laid out like city blocks. Strategy and intense concentration required. Superb, smooth animation of a dozen pieces simultaneously. One of the great ones. Sierra On-Line, Sierra On-Line Building, Coarsegold, CA 93614. $29.95. *1/82.*

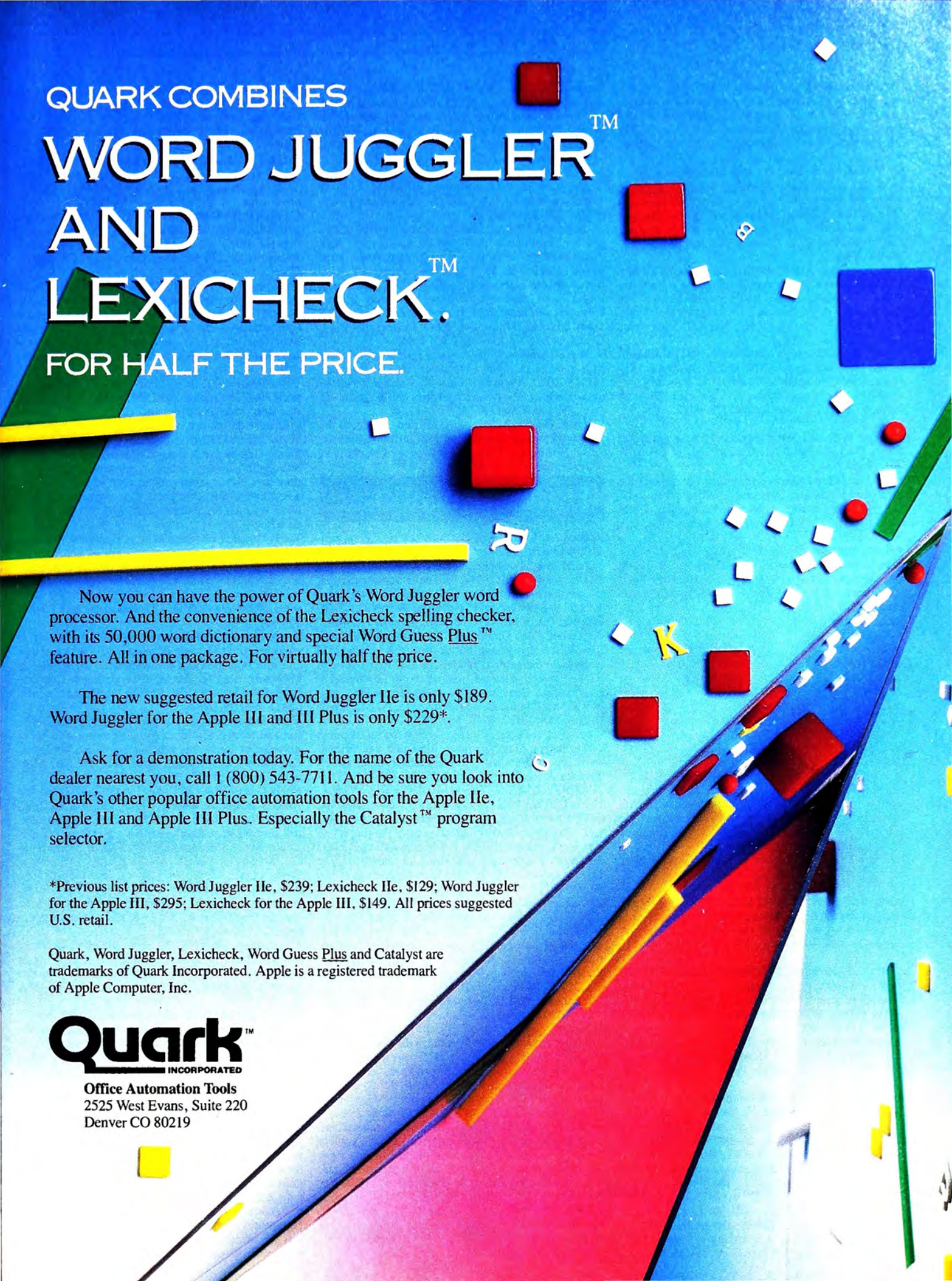
Cubit. Oswal. An adult, well-made interpretation of classic cube-hopping game. Clean-lined graphics; requires strategy. Micromax, 6868 Nancy Ridge Dr., San Diego, CA 92121. $39.95. *10/83.*

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.

Dino Eggs. Schroeder. Warp into the prehistoric past




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to save baby dinosaurs from extinction. Avoid snakes and spiders by climbing and jumping from peak to precipice while building fires to ward off the dreaded Dino Mom. Loads of Mesozoic fun. Micro Lab, 2699 Skokie Valley Rd., Highland Park, IL 60035. $40. *8/83.*

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. *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 94403. $40. *2/84.*

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.*

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.*

• **Lode Runner.** Smith. 150 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.

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. $19.95. *10/83.*

Star Blazer. Suzuki. Bomb-run game with five levels, minutely exact animation, and style to burn. A joy. Broderbund, 17 Paul Dr., San Rafael, CA 94903. $31.95. *4/82.*

✓ **Stargate.** Crisper, smoother, faster version of *Defender*. The radar is poor, but the action more than compensates. Atarisoft, 1265 Borregas Ave., Sunnyvale, CA 94086. $34.95. *3/84.*

Super Bunny. Leone. Help Reginald Rabbit ingest magic carrots and metamorphose into Super Bunny. Hop from elevator to elevator to defend Bunnyville from hostiles. Datamost, 8943 Fullbright Ave., Chatsworth, CA 91311. $29.95. *1/84.*

• **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

Algebra 1-4. EduWare. Sets of learning units progressing from algebraic rules to definitions to graphing and inequalities. Individualized teaching styles to fit everyone's needs. Good for adults wanting to overcome math anxiety as well as for schoolkids. Peachtree Software, 3445 Peachtree Rd., N.E., #830, Atlanta, GA 30326. $39.95 each. *Algebra 1, 5/81.*

Alphabet Zoo. Disharoon. Two programs in one. The first helps young children match letters with sounds. In the second, school-age kids move through a maze, selecting letters that spell words introduced in the first part. Generally good sound and graphics, animal motif. Spinnaker Software, 215 1st St., Cambridge, MA 02142. $29.95. *1/84.*

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 Language Arts. Chafin. *Word Invasion*, *Word Master*, *Word Radar*, *Word Man*, *Verb Viper*, *Spelling Wiz*. Lots of action and great detailed graphics in arcade-style vocabulary building games. Comes with teaching package. Developmental Learning Materials, 1 DLM Park, Allen, TX 75002. $44 each. *7/83.*

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 right and wrong 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.

Bumble Games. Six math concept games for ages four to ten. The Learning Co., 545 Middlefield Rd., #170, Menlo Park, CA 94025. $39.95.

Bumble Plot. Grimm. Colorful musical introduction to concepts of graphing and plotting. Teaches positive and negative numbers. The Learning Co., 545 Middlefield Rd., #170, Menlo Park, CA 94025. $39.95. *1/83.*

Cdex Training for the Apple IIe. Zunkel. Self-paced, graphically oriented training program. Cdex, 5050 El Camino Real, Los Altos, CA 94022. $59.95, three disks.

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 guide teach computer literacy. Examines hardware, DOS and DOS Sample Programs disk, and introductory programming. Even beneficial to experienced users. Personal Tutor Associates, Box 246, Clinton, MD 20735. $49.95. *3/84.*

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. 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.*

Ernie's Quiz. CTW. Four games, four subjects, one disk. Image recognition, counting skills, creativity, and Muppet expertise are introduced with lots of positive feedback. Apple, 20525 Mariani Ave., Cupertino, CA 95014. $50. *2/83.*

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.

Factor Blast. DeMuth. Select difficulty level, keyboard or paddle control, human or computer opponent, and begin blasting. One player directs a laser dish to blast a number on the screen; the other must blast a factor of that number. Aids in memorization, enhances math ability. Hayden Software, 600 Suffolk St., Lowell, MA 01853. $29.95. *1/84.*

The Fourth Leg of the Apple. Brinker. Combination text and disk tutorial explains hexadecimal system, Apple's circuitry and memory, and the 6502 microprocessor. Includes an overview of languages, a Forth tutorial, and a chapter on assembly language programming. Brinker Computing, 2775 Tessmer Rd., Ann Arbor, MI 48103. $49.95. *1/84.*

• **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,

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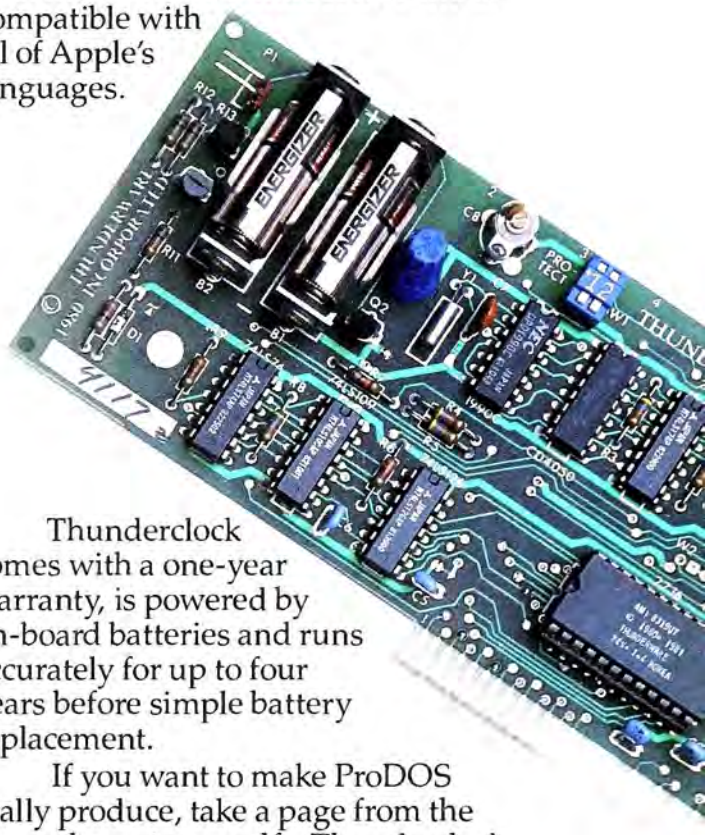
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Thunderclock.

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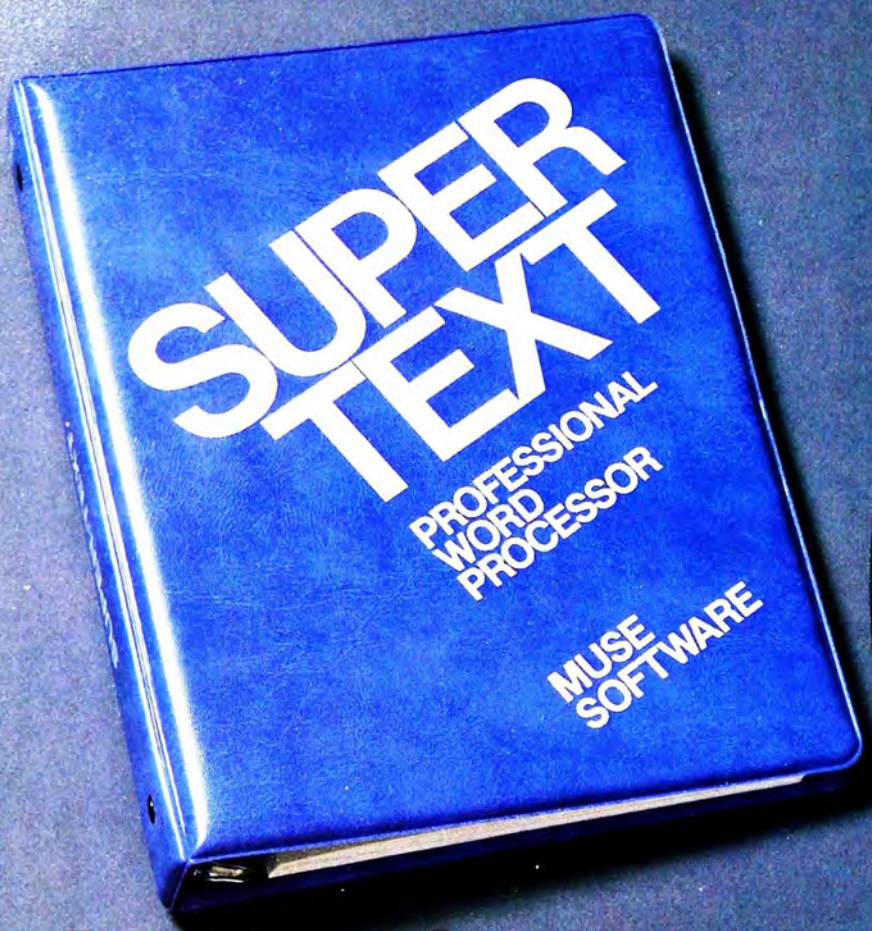
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1302 S. General McMullen, San Antonio, TX 78237. Two-sided disk, $29.95. *9/83*.

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 Puzzles. Perl, Grimm, Robinett. A delightful goose helps teach how to figure out situations given incomplete information. Super for developing reasoning skills in people ages six through forever. The Learning Co., 545 Middlefield Rd., #170, Menlo Park, CA 94025. $44.95. *2/83*.

• **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*.

The Grabit Factory. Box, Box. Easily controlled math game for ages five to eight. Student-controlled crane lifts numbers from a conveyor belt to perform number recognition, addition, or subtraction tasks. A grabber any way you look at it. Eric Software, 1713 Tulare, Fresno, CA 93721. $39.95. *1/84*.

Hey Diddle Diddle. Disharoon. Three reading and vocabulary games that strengthen reasoning ability. Ages 3 to 10. Spinnaker, 215 1st St., Cambridge, MA 02142. $29.95.

In Search of the Most Amazing Thing. Snyder. Role-playing game lets kids negotiate with aliens, fly hot-air balloon. Ages 10 to adult. Spinnaker, 215 1st St., Cambridge, MA 02142. $44.95. *7/83*.

Juggle's Rainbow. Nine learning games for prereading tots. Kids can create colorful pictures by using the keyboard. The Learning Co., 545 Middlefield Rd., #170, Menlo Park, CA 94025. $29.95.

Kindercomp. Learning exercises for ages three through eight. Spinnaker, 215 1st St., Cambridge, MA 02142. $29.95.

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*.

✓ **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*.

✓ **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.

• **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*.

✓ **Report Card.** Ringuette. Grading system allows teacher to weight importance of activities. Maintains any number of classes, makes grade changes easily, displays student percentages, prints grade reports. Sensible Software, 6619 Perham Dr., West Bloomfield, MI 48033. $59.95.

Rhymes and Riddles. Cross. Four games to teach reading and spelling to elementary schoolchildren. Fill in the blanks with the necessary phrase. Spinnaker, 215 1st St., Cambridge, MA 02142. $29.95.

Rocky's Boots. Robinett, Grimm. Rascally raccoon helps children build logical thinking and computer understanding. Construct machines of logical gates in convolutions of thickening complexity. Music and sound effects add to fun. The Learning Co., 545 Middlefield Rd., #170, Menlo Park, CA 94025. $49.95. *2/83*.

Shifty Sam. Baird, Ingram. Fast-moving game for ages eight to adult. Shifty Sam, a feisty casino dealer, challenges one or two players to a word battle. Different graphics. Develops word recognition, vocabulary, and spelling skills. Random House, 7307 S. Yale St., #103, Tulsa, OK 74136. $39.95.

Snooper Troops. Snyder. Ongoing hi-res mystery series in form of educational games. Highly structured; excellent fourth-through-eighth-grade educational tool. Fun for adults too. Spinnaker, 215 1st St., Cambridge, MA 02142. $44.95 each. *9/82*.

Spellakazam. Confronted with a sentence that's missing a word, you race a magician through a maze, picking up the letters to spell the word correctly. If the magician beats you to the magic hat you get fewer points, but accuracy is more important than speed. Variable skill level. DesignWare, 185 Berry St., San Francisco, CA 94107. $39.95. *1/84*.

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., Cam-

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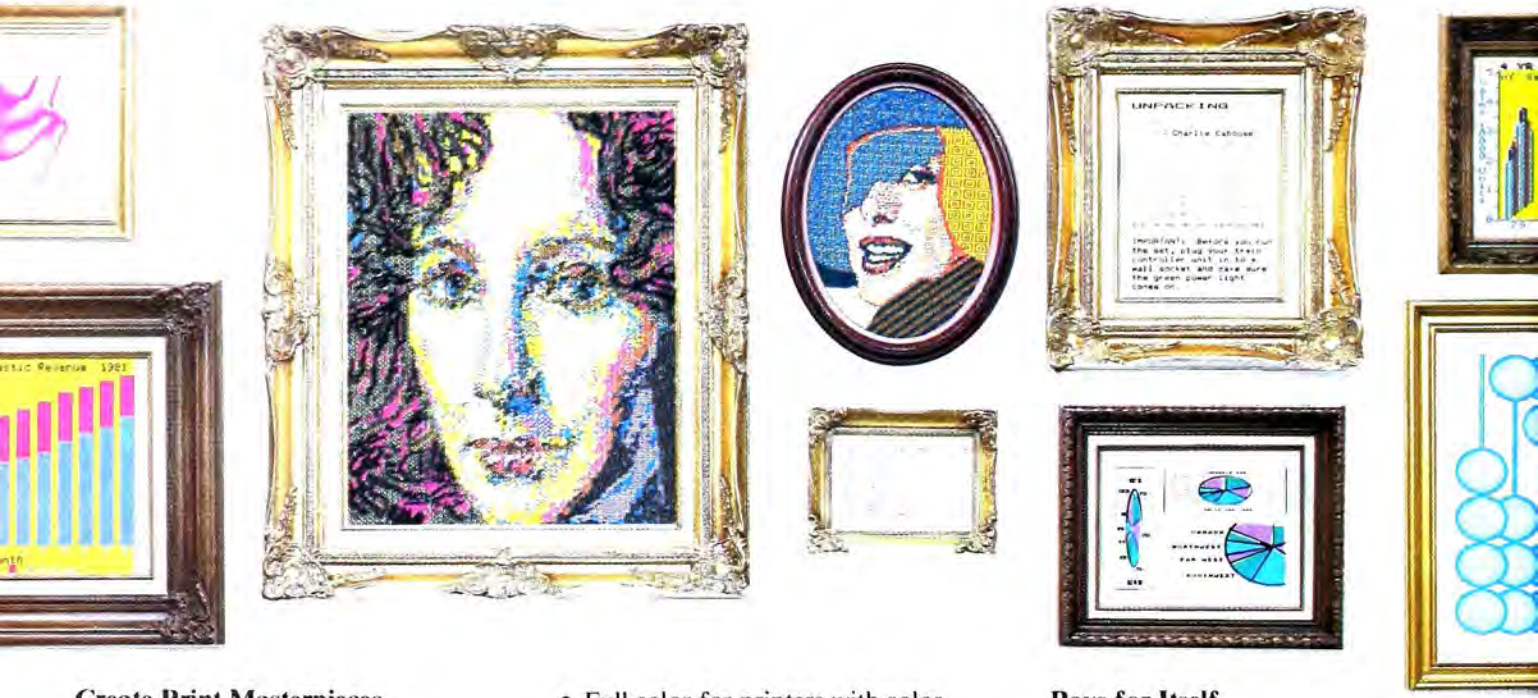
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✓ **Sweet Shoppe.** Boxes, Daus, Murrays. Mr. Jellybean and three instructive arcade games teach kids four to seven counting, subtraction, and addition of numbers one through ten. Colorful graphics, simple plot. Eric Software, 1713 Tulare, Fresno, 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.

Wizard of Words. Neely, Aaronson. Teaches vocabulary and spelling through five word games. Games include Jester's Jumble, a variation of anagrams; Castle Capers, a type of hangman; Word Spinning, a Scrabble-like game; Herald's Mark, a mystery word game; and Dragon's Spell, a word-creation puzzle. Advanced Ideas, 1442A Walnut St., #341, Berkeley, CA 94709. $39.95. *2/84.*

Strategy

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AirSim-3. Kurtz. Flight simulator provides navigational instruments, radar, pilot's-eye view. Acrobatic plane cruises at 195 knots, flies loops and rolls. Competitive with best simulators on the market. Mind Systems, Box 506, Northampton, MA 01061. $44.95. *12/83.*

Broadsides. Garris. Re-creates famous naval battles from the days of sail. Plays in either arcade or strategy mode. Strategic Simulations, 883 Stierlin Rd., A-200, Mountain View, CA 94043. $39.95. *12/83.*

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.

Casino. Five hi-res games, Vegas style: blackjack, baccarat, keno, poker, and roulette. Datamost, 8943 Fullbright Ave., Chatsworth, CA 91311. $39.95. *10/82.*

• **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.*

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• **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. *3/84.*

Fortress. Denbrook, Templeman. A cross of go and chess. You and your computer opponent build fortresses while seeking to dominate the area represented by the game board. Assemble a quiver of computer opponents, each with its own style of play. Simple to learn, challenging to play. Strategic Simulations, 883 Stierlin Rd., Building A-200, Mountain View, CA 94043. *1/84.*

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, 19818 Ventura Blvd., Woodland Hills, CA 91364. $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. $19.95. *7/83.*

Regatta. DeMuth, Peterson. Select a course, choose light or heavy winds, adjust your sail, and you're racing your small sailboat. Takes strategy, patience, and nerve; one for the old salts. Howard W. Sams, 4300 W. 62nd St., Indianapolis, IN 46268. $29.95. *1/84.*

• **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 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.

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.*

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.*

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.

ShortCuts. Puckett. Makes Applesoft more powerful by adding several new commands, capabilities. Provides user with intelligent input/output processor, automatic sorting routine, new ways to control program logic and data formatting. Penguin Software, Box 311, Geneva, IL 60134. $39.95. *2/84.*

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.

• **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.

Type Faces. Printing enhancement tool for dot-matrix printers; 15 hi-res character fonts available. Alpha, 12 New England Executive Park, Burlington, MA 01803. $125.

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.

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Apple Writer II and IIe. Includes WPL (word processing language). Additional functions menu; continuing features and functions menu; continuous read-

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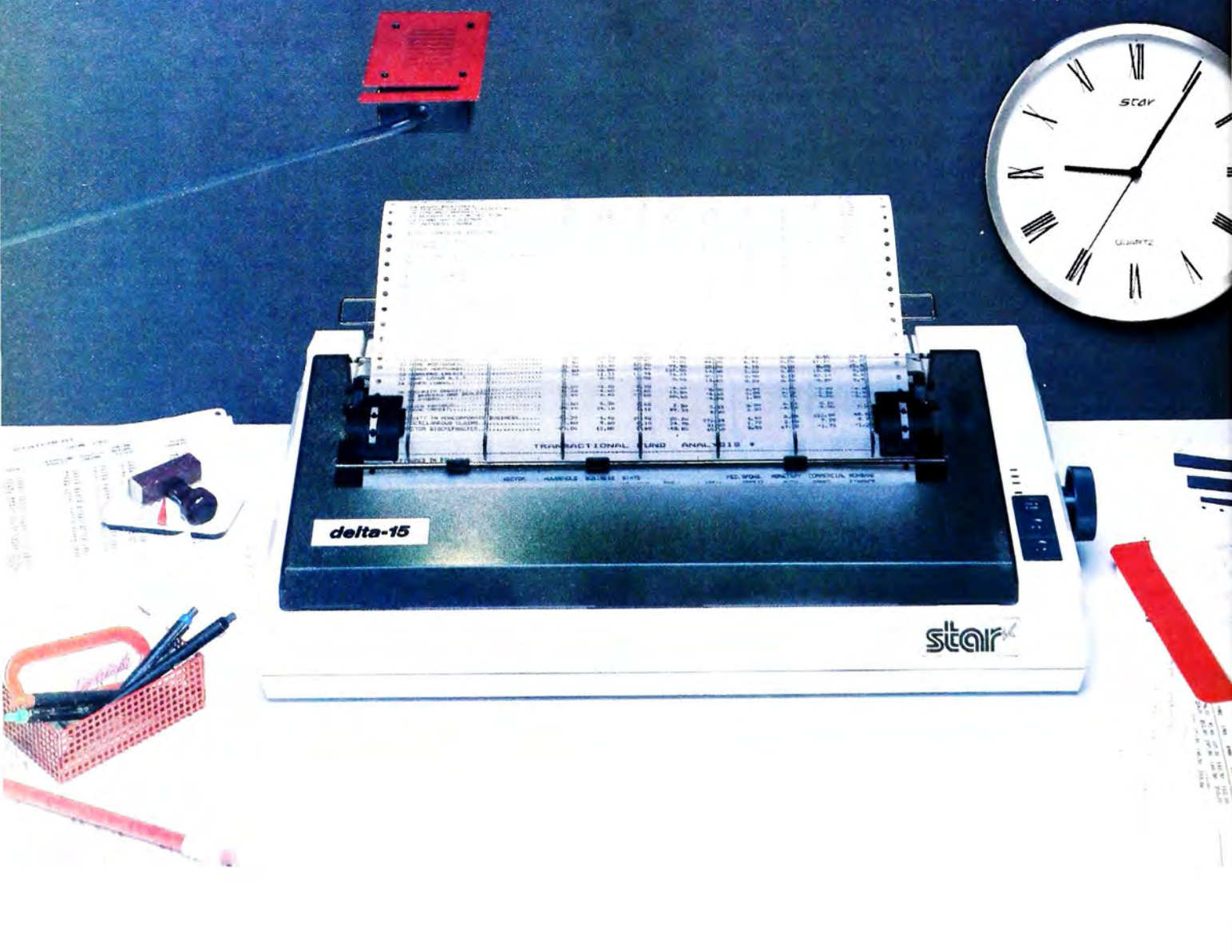
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out of characters and length. *IIe* has shift, shift-lock, and tab, four-arrow cursor control, and delete key; data files compatible with *II*. Apple, 20525 Mariani Ave., Cupertino, CA 95014. *II*, $150; *IIe*, $195.

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*.

Cut and Paste. Designed for simplicity. Features include scrolling menus, automatic word wrap, block indenting, page formats, page numbering. Electronic Arts, 2755 Campus Dr., San Mateo, CA 94403. $50. *2/84*.

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*.

Lexicheck IIe. Spell-checking companion to *Word Juggler IIe* has 50,000-word vocabulary, room for auxiliary personal dictionary, features global replacement of misspelled words. Quark, 2525 W. Evans Ave., #220, Denver, CO 80219. $129. Requires *Word Juggler IIe*, 128K. *10/83*.

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.

MegaSpell. Good news for users of *MegaWriter*. *MegaSpell* is an easy-to-use spell checker with a 40,000-word dictionary with room for 10,000 more. Imperfect dictionary, difficult to use without two drives. Megahaus, 5703 Oberlin Dr., San Diego, CA 92121. $59.95.*1/84*.

MegaWriter. Gives 80-column page without 80-column card, prints in boldface, underlines via menu; features mail list merge, find, replace, text block move. Reads Pascal and DOS files. Written in Pascal. Requires 64K. Megahaus, 5703 Oberlin Dr., San Diego, CA 92121. $99.95. *8/83*.

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, extendible 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*.

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WordStar. Screen-oriented, integrated word processing system in CP/M. Z-80. MicroPro, 33 San Pablo Ave., San Rafael, CA 94903. $495.
The Writer. Softwest. Easy to learn, easy to use for schoolchildren and adults. Create letters, memos, and reports, generate form letters. Compatible with *PIE Writer*. Hayden Software, 600 Suffolk St., Lowell, MA 01853. $49.95.

Apple III

Access III. Communications program for timesharing and standalone tasks; gives access to remote information services, minis, and mainframes. Apple, 20525 Mariani Ave., Cupertino, CA 95014. $150.
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.
BPI General Accounting. BPI Systems. Includes *General Ledger, Accounts Receivable, Accounts Payable*, and *Payroll*. Maintains customer, employee, and vendor files; prints customer statements, checks. Analyzes budget, compares historic information, keeps independent financial records for 99 different departments and locations. Provides password protection for each company, can be maintained on one disk. Requires 256K Apple III, ProFile hard disk. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. $495.
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.*
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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 spelling checker. Quark, 2525 W. Evans Ave., #220, Denver, CO 80219. $295. *12/82.* ■

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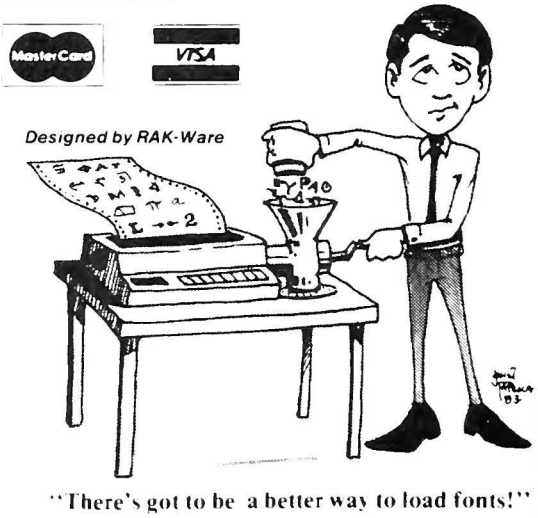
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Fishermen love to tell about the one that got away. Most of those stories can be categorized as tall tales, but there are real-life counterparts that are all too true.

The Boston Red Sox once had a pitcher and part-time outfielder named Babe Ruth. They traded him for a bunch of money and a couple of pretty fair players. The New York Yankees turned Ruth into a dynasty, winning more than twenty pennants in succeeding years. Boston won two.

The Philadelphia Warriors once had a center named Wilt Chamberlain. They sent him packing for a whole ton of money and about half the basketball players in the country over the age of sixteen. Philadelphia had to wait more than twenty years for Moses (Malone) to lead them to the promised land. The Los Angeles Lakers surrounded Chamberlain with exceptional talent and had the most successful season by any team in NBA history.

Hewlett-Packard once had an enterprising technician named Steve Wozniak. He designed and built a small computer, which he offered to the company. Apparently thinking the machine was just an elaborate Polish joke, HP declined to exercise their option. Wozniak and Steve Jobs took the small computer and built a one billion dollar company called Apple. Today, HP continues to struggle to gain a toehold in the personal computer market.

Blue Valentine. These stories are pertinent to the results of February's software sales as reported here, because a repetition of that pattern may be emerging.

Pioneer Apple owners may recall that VisiCorp, a company with which Fate has not dealt altogether kindly in recent history, once published entertainment software. Among their offerings was a highly touted text adventure called *Zork*, from a company called Infocom. Those same pioneers may remember that the author credits on *Zork*, as originally carried in the Top Thirty, were only slightly longer than the Boston telephone directory.

Zork was like a nova, flaring briefly, then disappearing from sight, eclipsed by the marvelous arcade games and hi-res adventures of the period.

VisiCorp decided that its future lay in business software, a proposition that Infocom was certainly willing to second. Infocom got back the rights to its product—in a deal much more amicably settled than the current brouhaha between VisiCorp and Software Arts over *VisiCalc*—and went on its merry way. Its way was text adventures in an era when nobody thought there was any future in text. Theoretically, graphics was the way to go.

Meanwhile, VisiCorp fleshed out the line of Visi applications products, started a successful book publishing enterprise, and concentrated their advanced development work on *VisiOn*.

The jury may be out for months or even years on VisiCorp, but the verdict has been reached on Infocom. And February was the month that the jury made it unanimous.

Apple III

This Month	Last Month	
1.	2.	**The Catalyst**, Tim Gill, Quark
2.	4.	**Quick File III**, Rupert Lissner, Apple Computer
	1.	**Apple Writer III**, Paul Lutus, Apple Computer
4.	10.	**Inventory**, Great Plains Software
5.	8.	**General Ledger**, Great Plains Software
	3.	**VisiCalc: Advanced Version**, Software Arts/Dan Bricklin and Robert Frankston, VisiCorp
7.	9.	**PFS:File**, John Page and D.D. Roberts, Software Publishing Corporation
8.	10.	**Accounts Payable**, Great Plains Software
	—	**Accounts Receivable**, Great Plains Software
10.	—	**General Ledger III**, George Shackelford, State of the Art

Arcade 10

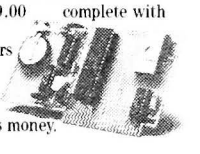
This Month	Last Month	
1.	1.	**Lode Runner**, Doug Smith, Broderbund Software
2.	3.	**Julius Erving and Larry Bird Go One-on-One**, Eric Hammond, Julius Erving, and Larry Bird, Electronic Arts
3.	2.	**Zaxxon**, John Garcia, Datasoft
4.	6.	**Pinball Construction Set**, Bill Budge, Electronic Arts
5.	4.	**Choplifter**, Dan Gorlin, Broderbund Software
6.	5.	**Miner 2049er**, Mike Livesay and Bill Hogue, Micro Fun
7.	8.	**Hard Hat Mack**, Michael Abbot and Matthew Alexander, Electronic Arts
8.	10.	**Beagle Bag**, Bert Kersey, Beagle Bros
9.	9.	**Spare Change**, Dan and Mike Zeller, Broderbund Software
10.	—	**Defender**, Atarisoft

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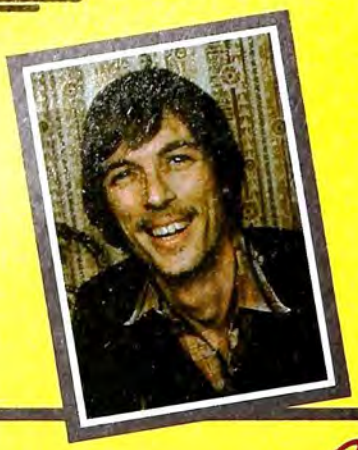
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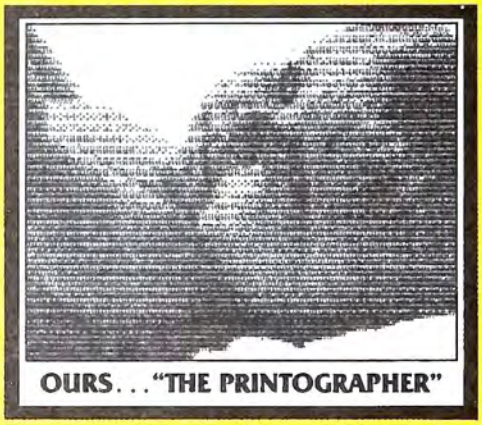
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Completely Visual Editing	No	Yes
Oval Editing	No	Yes
Diamond Editing	No	Yes
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Interface Cards	34	34
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Comparisons as of 3/1/84, based on Zoom Grafix (Second Edition) and Printographer (Version 4.3). Pictures shown are actual size, single magnification, and were produced on an Epson MX80 Printer.



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While *VisiCalc* was falling out of the Top Thirty on a technicality, Infocom finally succeeded at what it had been threatening to do for more than a year: It swept the Adventure 5 category. Curiously enough, the bestselling adventure program was Infocom's *Zork I*. This is the identical package that VisiCorp once relinquished, the only change being the addition of the Roman numeral to the name to distinguish the original from its siblings II and III.

Zork II, *Zork III*, *Enchanter*, and *Deadline* followed the original *Zork* in the list. *Coveted Mirror*, which had been Infocom's most recent nemesis in preventing a sweep, narrowly missed the fifth spot.

The Lazarus Effect. The renewed success of *Zork I* is a phenomenon in and of itself. No other piece of entertainment software in the history of the Apple II has experienced such a complete resuscitation without a major overhaul. It's relatively common for applications software to get a sales boost after revision—a plethora of word processors represent the best examples—but no other game has ever died as complete a death as *Zork* and then come back, unchanged, to life.

The recent renewed vigor of *Flight Simulator II* and *Sargon III* gets its stimulus from drastically revised and upgraded versions. *Zork* is the only true Lazarus among entertainment software.

Damn Yankees. Meanwhile, VisiCorp must be pondering what unintentional slight it had made to Dame Fortune. First it paid Mitch Kapor

Word Processors 10

This Month	Last Month	
1.	1.	**Apple Writer IIe**, Paul Lutus, Apple Computer
2.	3.	**PFS:Write**, Sam Edwards, Brad Crain, and Ed Mitchell, Software Publishing Corporation
3.	2.	**Bank Street Writer**, Gene Kuzmiak and the Bank Street College of Education, Broderbund Software
4.	6.	**HomeWord**, Ken Williams and Jeff Stephenson, Sierra On-Line
5.	7.	**Word Juggler IIe**, Tim Gill, Quark
6.	4.	**Sensible Speller**, Charles Hartley, Sensible Software
7.	8.	**WordStar**, MicroPro
8.	5.	**Word Handler**, Leonard Elekman/Silicon Valley Systems, Advanced Logic Systems
9.	9.	**Format-II**, G.K. Beckmann and M.A.R. Hardwick, Kensington Software
10.	—	**Apple Writer II Pre-Boot Disk**, Kevin Armstrong and Mark Borgerson, Videx

Home Education 10

This Month	Last Month	
1.	1.	**MasterType**, Bruce Zweig, Scarborough Systems
2.	3.	**Apple Logo**, Logo Computer Systems, Apple Computer
3.	2.	**Typing Tutor**, Dick Ainsworth, Al Baker, and Image Producers, Microsoft
4.	7.	**Early Games for Young Children**, John Paulson, Counterpoint Software
5.	4.	**Computer SAT**, Harcourt Brace Jovanovich
6.	5.	**Snooper Troops I**, Tom Snyder, Spinnaker Software
7.	6.	**In Search of the Most Amazing Thing**, Tom Snyder, Spinnaker Software
8.	8.	**Facemaker**, DesignWare, Spinnaker Software
9.	10.	**Kindercomp**, Doug Davis, Spinnaker Software
10.	—	**Logo**, Krell Software

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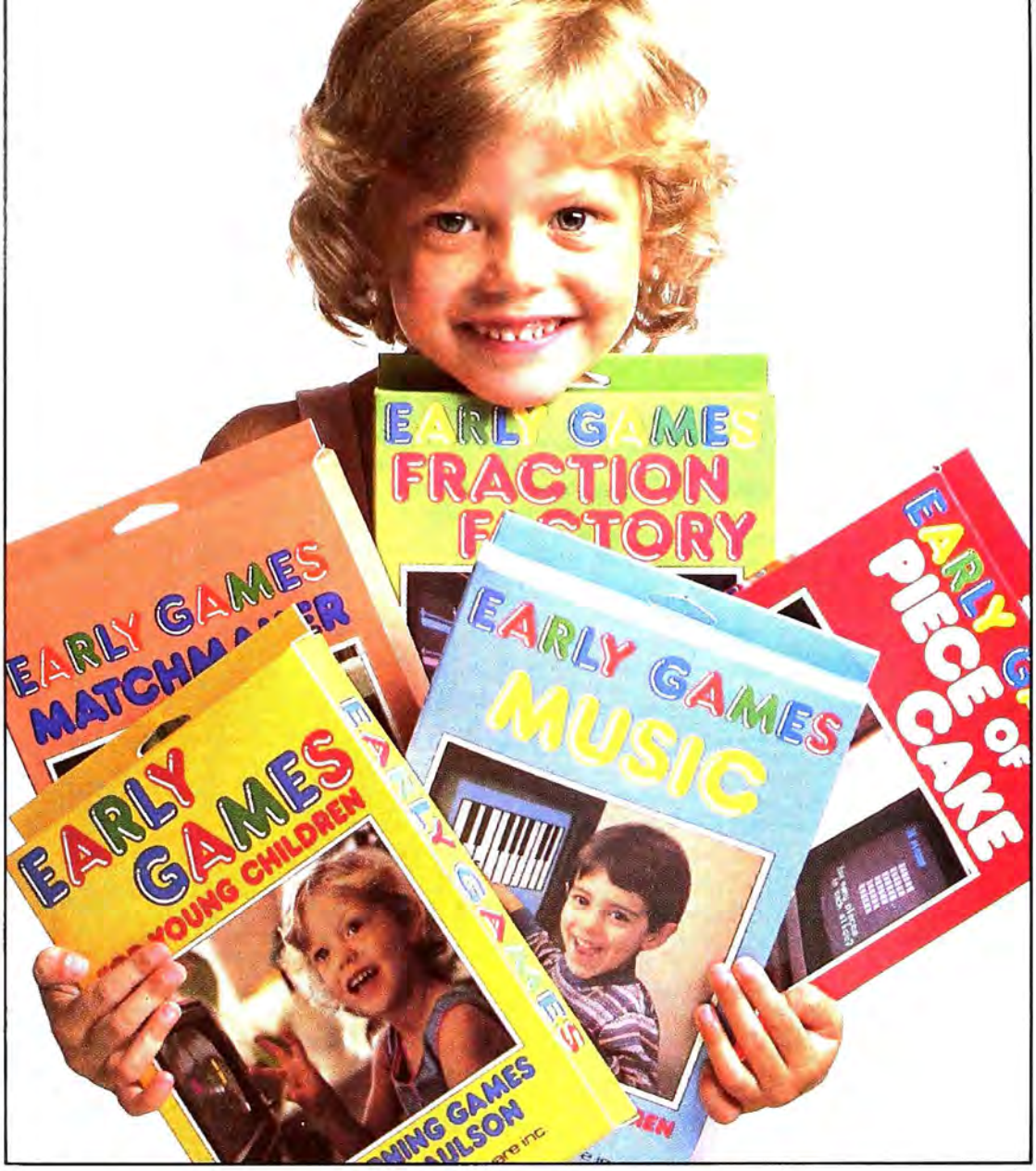
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more than one million dollars for the rights to *VisiTrend* and *VisiPlot*, only to watch Kapor parlay the money into *1-2-3*, a product that knocked the wind right out of *VisiCalc*'s sales in the IBM market. Now it must watch while *Zork* becomes one of the all-time bestselling pieces of software of any kind.

The fly in the *VisiCalc* ointment regarding the Apple II market is that there are currently two major versions being sold. *Softalk* tracks the two separately. Together, they would have been thirteenth on the Top Thirty. Separately, neither made the list. February also marked the first month in which *VisiCalc* failed to be among the thirty bestselling programs in the IBM market, although there the cause was more *1-2-3* than a division of sales among *VisiCalc* versions.

The two highest placed newcomers to the Top Thirty were word processing programs, and their success sends mixed signals as to what the Apple market favors. *HomeWord*—a simple, limited capacity word processor from Sierra On-Line—jumped to fourteenth, while Quark's *Word Juggler IIe*—perhaps containing the most features of any word processor introduced in recent months—collared fifteenth.

Easy Street. *HomeWord*'s success reflects the current trend toward simpler, less expensive word processing programs. *Bank Street Writer* pioneered that trend and *PFS:Write*, which this month passed *Bank Street Writer*, was the second program to address that niche.

Word Juggler IIe hearkens back to the higher priced, more capable programs such as *WordStar*, *Format-II*, *Zardax*, and *Executive Secretary*. These programs will do almost everything except lick the envelope.

February Chill. The market for entertainment software seems to have undergone the expected gradual decline following the holiday buying spree. Notable was the addition of *Defender* to the Arcade 10. That marks a breakthrough for Atarisoft's line of arcade entries. Ken Uston's *Professional Black Jack* was a strong sixth among strategy games, but

Adventure 5

This Month	Last Month	
1.	1.	**Zork I**, Infocom
2.	2.	**Zork II**, Infocom
3.	3.	**Zork III**, Infocom
4.	–	**Enchanter**, Infocom
5.	–	**Deadline**, Infocom

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
	—	**Pensate**, John Besnard, Penguin Software

Fantasy 5

This Month	Last Month	
1.	1.	**Wizardry**, Andrew Greenberg and Robert Woodhead, Sir-tech
2.	4.	**Exodus: Ultima III**, Lord British, Origin Systems
3.	2.	**Legacy of Llylgamyn**, Andrew Greenberg and Robert Woodhead, Sir-tech
4.	3.	**Knight of Diamonds**, Andrew Greenberg and Robert Woodhead, Sir-tech
5.	5.	**Ultima II**, Lord British, Sierra On-Line

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Although some information in *Understanding the Apple II*, including that on disk controller operation, applies to the Apple IIe, this book primarily describes Apple II computers sold prior to 1983. A companion text, *Understanding the Apple IIe*, will become available in the summer of 1984.

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more noticeable was the overall depth of the catalog from Strategic Simulations. Twenty-four of the next twenty-seven programs were SSI titles. *Exodus: Ultima III* jumped to second in the Fantasy 5.

Out of the Shell. It was business as usual in the Home Education 10, with one exception. *Krell's Logo* jumped into tenth place. The strong

Business 10

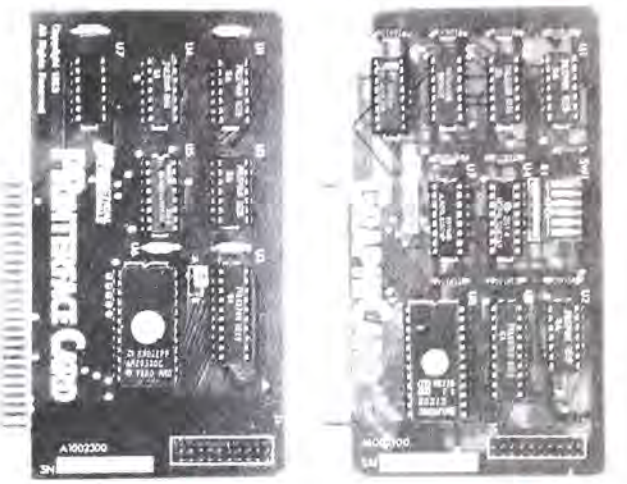
This Month	Last Month	
1.	1.	**PFS:File**, John Page and D.D. Roberts, Software Publishing Corporation
2.	2.	**Quick File IIe**, Rupert Lissner, Apple Computer
3.	4.	**Multiplan**, Microsoft
4.	3.	**PFS:Report**, John Page, Software Publishing Corporation
5.	6.	**PFS:Graph**, Bessie Chin and Stephen Hill, Software Publishing Corporation
6.	5.	**VisiCalc**, Software Arts/Dan Bricklin and Robert Frankston, VisiCorp
7.	—	**VisiCalc: Advanced Version IIe**, Software Arts/Dan Bricklin and Robert Frankston, VisiCorp
8.	10.	**BPI General Accounting**, John Moss and Ken Debower, Apple Computer
9.	—	**General Ledger**, George Shackelford, State of the Art
10.	—	**Accounts Receivable**, George Shackelford, State of the Art

Hobby 10

This Month	Last Month	
1.	3.	**Global Program Line Editor**, Neil Konzen Beagle Bros
2.	2.	**Zoom Graphics**, Dav Holle, Phoenix Software
3.	9.	**Pronto DOS**, Tom Weishaar, Beagle Bros
4.	6.	**DiskQuik**, Harry Bruce and Gene Hite, Beagle Bros
5.	4.	**DOS Boss**, Bert Kersey and Jack Cassidy, Beagle Bros
6.	—	**Silicon Salad**, Bert Kersey and Mark Simonsen, Beagle Bros
7.	1.	**Graphics Magician**, Chris Jochumson, David Lubar, and Mark Pelczarski, Penguin Software
8.	7.	**Double-Take**, Mark Simonsen, Beagle Bros
9.	7.	**Beagle Basic**, Mark Simonsen, Beagle Bros
10.	5.	**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.	3.	**Music Construction Set**, Will Harvey, Electronic Arts
4.	6.	**ASCII Express: The Professional**, Bill Blue and Mark Robbins, United Software Industries
	9.	**Tax Advantage**, Henry Hilton and Harry Coons; Continental Software
6.	4.	**Micro Cookbook**, Brian E. Skiba, Virtual Combinatics
7.	—	**Tax Preparer**, James Howard, HowardSoft
8.	5.	**Smartcom I**, Hayes Microcomputer Products
9.	8.	**Crossword Magic**, Steve and Larry Sherman, L&S Computerware
10.	7.	**Data Capture 4.0**, George McClellan and David Hughes, Southeastern Software



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Softalk Presents The Bestsellers

showing is all the more remarkable in that Krell did it with a much narrower distribution band than most competing products. The program was in fewer than one-fifth of the retail outlets that regularly handle educational software, but the relatively few stores that carried the product sold it by the boatload.

On the hobby front, Beagle Bros again scored eight of the top ten, as well as fourteen of the top sixteen. Only *Zoom Graphics* and *Graphics Magician* withstood the Beagle onslaught in February. *Global Program Line Editor* was the leading entry, and Beagle's newest, *Silicon Salad*, immediately jumped into sixth place.

The Ides of April. *Home Accountant* continues to pace the Home 10 list, but tax packages for planning and preparation started to make themselves felt in February. *Tax Advantage* tied for fourth, and *Tax Preparer* was seventh. *Tax Manager* and *Personal Tax Planner* also scored well.

The Business 10 list remained headed by *PFS:File* with few changes below it. *BPI General Accounting* remains the leading Apple II accounting package, with State of the Art in hot pursuit.

Reaping Rawhide. In the Apple III market, however, it's Great Plains Software that's making the biggest splash in accounting software. *Catalyst* took over the lead in an Apple III market that has seemed relatively static. Change hovers on the horizon, with newcomers *Three Easy Pieces* and *Keystroke Database* making their presence felt. ART

Apple-franchised retail stores representing approximately 5.13 percent of all sales of Apple and Apple-related products volunteered to participate in the poll.

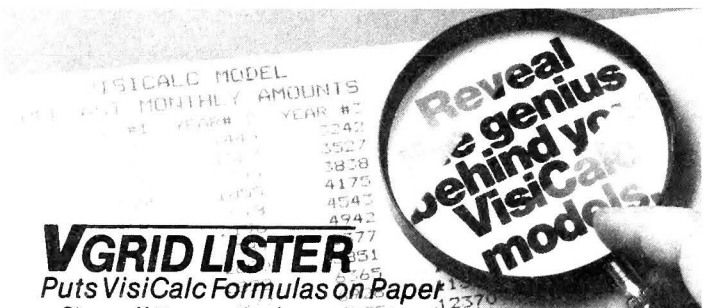
Respondents were contacted early in March to ascertain their sales for the month of February.

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 March 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 3.01 percent, which translates roughly into the theoretical possibility of a change of 3.13 points, plus or minus, in any index number.



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The Top Thirty

This Month	Last Month	Index	
1.	1.	144.57	**Apple Writer IIe**, Paul Lutus, Apple Computer
2.	2.	96.73	**Flight Simulator II**, Bruce Artwick, SubLogic
3.	4.	76.89	**MasterType**, Bruce Zweig, Scarborough Systems
4.	5.	70.51	**PFS:File**, John Page and D.D. Roberts, Software Publishing Corporation
5.	6.	68.38	**Lode Runner**, Doug Smith, Broderbund Software
6.	13.	66.97	**Apple Logo**, Logo Computer Systems, Apple Computer
7.	7.	62.71	**PFS:Write**, Sam Edwards, Brad Crain, and Ed Mitchell, Software Publishing Corporation
8.	9.	59.17	**Quick File IIe**, Rupert Lissner, Apple Computer
9.	3.	57.75	**Bank Street Writer**, Gene Kuzmiak and the Bank Street College of Education, Broderbund Software
10.	10.	52.44	**Home Accountant**, Bob Schoenburg, Larry Grodin, and Steve Pollack, Continental Software
11.	18.	49.96	**Multiplan**, Microsoft
12.	14.	48.19	**Julius Erving and Larry Bird Go One-on-One**, Eric Hammond, Larry Bird, and Julius Erving, Electronic Arts
13.	16.	46.41	**PFS:Report**, John Page, Software Publishing Corporation
14.	—	44.64	**HomeWord**, Ken Williams and Jeff Stephenson, Sierra On-Line
15.	—	44.29	**Word Juggler IIe**, Tim Gill, Quark
16.	8.	43.93	**Wizardry**, Andrew Greenberg and Robert Woodhead, Sir-tech
17.	29.	43.23	**Dollars and Sense**, Frank E. Mullin, Monogram
	12.	43.23	**Zaxxon**, John Garcia, Datasoft
19.	11.	38.62	**Typing Tutor**, Dick Ainsworth, Al Baker, and Image Producers, Microsoft
20.	28.	37.56	**Sensible Speller**, Charles Hartley, Sensible Software
21.	25.	35.08	**Exodus: Ultima III**, Lord British, Origin Systems
22.	19.	33.66	**Zork I**, Infocom
23.	—	32.95	**Global Program Line Editor**, Neil Konzen, Beagle Bros
24.	—	32.24	**Zoom Graphics**, Dav Holle, Phoenix Software
25.	—	31.52	**Music Construction Set**, Will Harvey, Electronic Arts
26.	—	31.18	**Pinball Construction Set**, Bill Budge, Electronic Arts
27.	16.	30.82	**Legacy of Llylgamyn**, Andrew Greenberg and Robert Woodhead, Sir-tech
28.	15.	30.47	**Choplifter**, Dan Gorlin, Broderbund Software
29.	26.	29.75	**Sargon III**, Dan and Kathe Spracklen, Hayden
30.	—	28.34	**Early Games for Young Children**, John Paulson, Counterpoint Software

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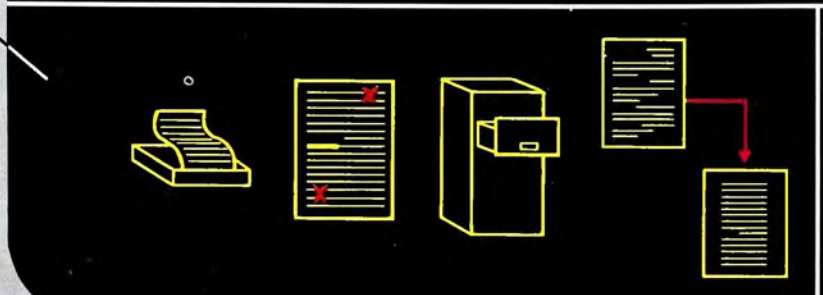
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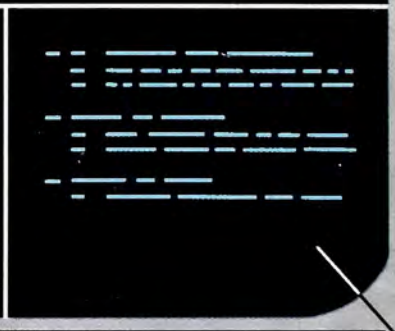
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