

(C O N T E N T S)

SOFTALK

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Women at Work with Apples

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CONTEST: SECRET ORDERS

This month, readers of *Assembly Lines* will find a challenging contest from Roger Wagner, for which you must use the machine language he's taught you.

Just to make sure we all keep our hand in on Applesoft, at least in a general way, Secret Orders was invented.

Here's the idea. Find the complete list of Applesoft commands in your manual. Now, look for one occurrence each of as many of those commands as you can in

Mail this coupon along with your list of commands and their locations to Softalk Secret Orders, 10761 Burbank Boulevard #6, North Hollywood, CA 91601. How many commands did you find? _____ My list of commands and where I found them is attached. If I win, the prize I'd like is _____

Name: _____

Address: _____

City/State/Zip: _____

Your Dealer: _____

Autograph, please: _____

the pages of this issue. Make a list of the commands you find, citing the page and location on the page where you found each command.

The person who finds—and cites—the largest number of different Applesoft commands wins.

Important: One instance of each command is all that's counted. So, although you might find the word *print* a number of places, only note it once and go on to another command.

A command can be made up of any regular pattern of letters. For example, if the first letters of four paragraphs in a row spelled out CONT, that would count; the word peppermint would fairly yield the command INT. A sentence containing the words *using ether* would give you

(Contest is open to all *Softalk* readers except those in any way connected to *Softalk's* staff or suppliers. If you can find a way to have your Apple help you solve this one, we'd like to know about it! Multiple entries are okay, but each entry must include an entry blank or a facsimile of one. Yes, it can be on anything at all, so long as your dog hasn't chewed it up. Ties will be settled by Apple's random generator.)

the command GET. Letters making up the command can be in backward order or any other configuration, so long as they yield the command by a simple, logical, and regular process. Ads, captions, pictures are all fair game. Use your imagination.

It may or may not be possible to find all the commands. When you think you've found all there are, make out a legible list explaining where you found each one and mail it in with the coupon.

Lord British. It turns out that there is an area of the country in which Lord British is fairly well-known, although no one of the people of this area has been able to fully describe his identity, as opposed to giving his name. So, while we will award a prize to the first of those people who contacted us, we will also go on with our original plan for the fun of the rest of the country's Apple owners and award another prize to anyone who can come up with a close explanation of the mysterious author of *Akalabeth*.

Because there are a larger number than we had realized who are privy to Lord British's identity—and if you know you're in that category, the prize for your situation has already been claimed—we're going to reveal all the rest of the clues now; from there, let your imagination go.

Here is an example of the unique kind of deductive, imaginative (and totally wrong) thinking we hoped our readers would come up with.

Thanks to "Akabyramben" for: "Since Lord British is the author of *Akalabeth*, the 'obvious' answer to the puzzle is that she is Beth Lord, a Briton living in Los Angeles. The clues leading to this solution are that the game's name, *Akalabeth*, means 'a.k.a. L.A. Beth' or alias Los Angeles Beth, and Lord British is just reversed to throw us off the track. In 'reality,' Lord British is British Ms. Lord.

"Please write soon. We need the money.

"Yours incognito, Akabyramben Schwartz American"

Given his reasoning on *Akalabeth*, can you figure out this writer's real name? This strange person claims to need money, not an unusual complaint, so, unless someone comes up with a closer description of Lord British and unless someone deduces Akabyramben's real name, we'll send him a consolation prize.

Here are the rest of the clues about Lord British:

3. He and his home city are closely related to present and future blastoffs.

4. He works at a store on the King's Highway near the city of the clear lake in the land of computers.

5. Computerland knows him as the Son of Skylab I and if you call you'll know him too.

Give it a try! \$50 in prizes could be yours. ■

The Score on the Winners!

Theron Fuller of Alexandria, Virginia, first *Softalk* reader to solve EduWare's *The Prisoner* correctly and escape from the Island, celebrated his new freedom by dashing off a glowing review of the game. You'll find Fuller's review, with his initials, in Marketalk Reviews. It turned out that Fuller need not have won a contest to have a review published; his critical and writing abilities easily stand on their own merit.

Fuller opted for *Computer Air Combat* by Strategic Simulations as his prize; he'll be picking it up at Computers Plus Inc., his local dealer in Alexandria, and *Softalk* plans to have a photo of the event by April.

The Oracle. Michigan beat Washington, 23-6, in the Rose Bowl, a difference of 17 points. The Oakland Raiders beat the Philadelphia Eagles, 27-10, in the Super Bowl, also, coincidentally, a difference of 17 points. Therefore, the winning answer for part one of the Oracle was 34, the combined differences between the winners and losers in these games.

Only two entries predicted 34. The Apple Random Number Generator chose as the winner Barbara Wright of Ocean-

port, New Jersey. Wright sent only one entry, although it arrived in a package with the entries of three other members of the Wright clan. Losing the draw was Gary Kim of Seattle, Washington, who sent twenty-one entries, but only one that predicted 34. Both Wright and Kim go into part two of the Oracle with 0 points, the best possible score at the moment. Nine of Kim's entries came within four points of 34.

Other entries with better than -5 scores were Roger Kim, also of Seattle, WA, -1; Rick Jones, Spokane, WA, -1; Cliff Josephy, Brookville, NY, two entries at -1, one at -3, and two at -4; King Ables, Austin, TX, -2; Daniel Tobias, Poughkeepsie, NY, -2; Steven M. Williamson, Wayland, MI, -3; Tim Powers, Carrollton, GA, -3; Douglas Stewart, Cape Elizabeth, ME, -3; C. H. Ballard, Monticello, MN, -3; Thomas P. Murray, Hayward, CA, -3; Jim Ganz, West Hartford, CN, -4; Paul Shanberg, Moraga, CA, -4; Josh Greenberg, New York, NY, -4. You can determine your score so far in the Oracle by finding the difference between your prediction for part one and 34 and making it a negative

number. Don't be discouraged if your score is not great; there're five more parts to the contest and you could still come out on top.

Limericks. On page 19 you will find the ten limericks named as finalists in January's contest. It's up to our readers to vote for the final winner. Picking ten was very difficult. We were astonished at how many good poets there are.

Some excellent limericks were ineligible, either because they did not find the secret word or because they included no name of a *Softalk* January advertiser or of that advertiser's product. The secret word was *shamrock* and was found in the example of the upside down Silentye font on page sixteen of the January issue. A few entries included Apples or Apple Computer products; but Apple—much as we love them—is not a *Softalk* advertiser.

The companies or products identified are Avant Garde, *Both Barrels*, *Dogfight*, EduWare, Microsoft, On-Line, Verbatim, and VersaWriter. See if you can spot all of them.

Now turn to page 19 to enjoy the limericks. GOTO 19



The Women of

BY MARGOT COMSTOCK TOMMERVIK

One name occurred a preponderance of times during *Softalk's* conversations with the women of Apple; always, that name was accompanied by a special measure of pleasure, like the warmth of the secret smile you feel when unexpectedly you remember something particularly nice.

The name belongs to Mike Markkula, chairman of the board at Apple Computer Inc. *Softalk* asked Markkula himself to introduce the Women of Apple. In the process, he offered his description of Apple Computer's position on issues of prejudice and human rights.

"They're all superstars in my mind, and each has contributed to Apple's success. It's great." The man who hired many of the superstars adds, "That's why I sleep well!"

"But it isn't only the women at Apple that are superstars; it's the men, too. I don't think of the women as different from the men in business, and they aren't treated differently."

Pride and No Prejudice. "At Apple, those kinds of things aren't important. People have abilities and desires; as a manager you must provide what each person needs to make the most of those abilities.

"I feel good when I see people succeed. It gives me personal satisfaction—that's what's fun.

"You have to allow people the opportunity to fail. If you watch over them, catching any misstep along the way, they won't feel a sense of accomplishment when they do succeed; instead, they'll feel like cogs. But, if you've left them on their own, then *they* succeeded.

"I'm proud of them, but, more important, they're proud."

The Apple Sense of Life. Pride plays a major role in the sense of life at Apple.

"The attitude is special. There's a word: impute. Its meaning can be taken to describe the idea that people do judge a book by its cover—or a product by its manuals and packaging, more than by the product itself.

"At Apple, we know the quality of our product. But it makes everyone feel good that we maintain that quality through every stage of the business, down to the shipping crates the Apples are packed in. No one's job is such that less quality is required."

At Home with Themselves. Among the qualities that make the Apple women unique, one stands out. It is a strong, unself-conscious sense of self-worth that makes each of these women stand tall and straight, that enables them to turn their focus to the world without inhibition and to deal with that world with confidence.

It is fascinating and delightful that this same strong personal identity leads to an equally strong sense of themselves as women; and these eight very capable businesspeople are among the most feminine women you could ever hope to meet.



Jo Kellner

Fish swim leisurely through underwater plants in a hexagonal aquarium, enjoying the changing reflections from the swirling colored mylar bits in the newest version of the lava lamp. Land plants spring from various size pots in the corners and on top of cabinets. Three stuffed animals, cuddly variety, laze atop a new Apple III. Softly enough to be in the background, a stereo gives forth the electronic strains of synthesizer music.



Apple

Clockwise around table from left: Eileen Forest, Jo Kellner, Pat Marriott, Jean Richardson (see Exec Apple, page 42), Rilla Reynolds, Carol Hausmann, and Lynda Maybruck.

Completing the decor are a much used Apple II with monitor, Silentype, four disk drives, modem, several telephones, and packed shelves of books and manuals, including loose-leafs of detailed technical information, whose working knowledge is available for solving your problems.

Animals Salve the Soul. In the midst of all this, in the tiny space left for people, sits a woman speaking, apparently, into the air. At second glance, you notice the tiny headpiece she wears to allow her to converse long hours by phone without wearing out her ears. The fish, plants, and animals are there to help avoid wearing out her soul.

This is Jo Kellner, and Jo is one of the experts who field the questions Apple users find important and puzzling enough to call in on the Apple Hotline.

The Hotline was founded by Jim Hoyt two years ago. Since then, it has grown to a department of four people.

Working on Apple's Hotline has its difficult moments—and they usually seem to come in bunches. Many times, people wait to call the hotline until they are thoroughly frustrated; then they take out their frustration on the ear on the listening end of the phone. Some people call just to vent their anger; others become angry if they can't get an answer to their question, even if the answer is proprietary.

Calls like these prompt the homey cubicles, the plants, the stuffed animals. All the Hotline people have their personal touches pervading their offices.

Easing the Sting of a Gaff. Typical questions range from how to complete a connection on a user's personally designed interface card to where to find the power switch on the Apple. One man called because he could not get the color to work on his brand-new Apple II. After twenty minutes of phone-directed adjustment of knobs, dials, and channels, even to fiddling with the RF modulator potentiometers, inspiration dawned

and Kellner asked, "You do have a color television, don't you?" "Oh, no," said the user, "black and white."

Discoveries such as this—that the user has overlooked an obvious answer—often cause the caller some embarrassment. When the call has been made in good faith, Kellner enjoys telling a tale on her husband—with his permission—to keep the caller from feeling foolish. Jo's husband Charlie is a highly respected engineer and programmer at Apple.

The story has it that one evening Charlie began some programming at home while Jo relaxed in a hot tub. Soon there was a knock on the bathroom door. "Doesn't Applesoft allow multiple dimension arrays?" Charlie asked. Jo answered that it did and heard Charlie returning downstairs mumbling about syntax errors. Several minutes later he was back. "Then why do I get a syntax error every time I try to use an array?" was the distraught question, and again he descended to try further. Jo had just decided to pull herself out of the comfortable bath to look into the problem when Charlie returned once more. "Never mind," he called sheepishly. "I found the problem. I was in Integer Basic!"

Hearing the Hidden Problem. "We have to be like fast-access random data bases," Kellner says of the Hotline people, "then add that quality no computer has achieved yet: we have to listen below what's said. Often the problem the customer is complaining of is merely a symptom of something else."

If Hotliners don't know the answers, they do know where to refer the callers, even if that's to another company. But many problems can be solved by a single procedure: turning the Apple's power off, then cleaning card contacts and seating chips. Many seemingly serious problems arise from these simple oversights. Customers seldom call back; what the Hotliners tell them works.

As to the hard times on the Hotline, Kellner works at not taking it personally. "You learn to let it roll off; you have to remind yourself that the problems aren't your fault."

Degrees Power Ran into Law. When Kellner took the master's at Oregon State University, on fellowship from the Public

Health Service, the astronauts were just back from the first moon shot. Kellner watched from the control room as university radiation experts analyzed moon rocks. She determined her main interest to be in radiation health, a field that entails going into questionable areas to investigate their safety.

But when Kellner graduated—the only woman in the curriculum—she found it impossible to find work in her field: women of child-bearing age were not hired for such jobs.

Radiation expert Kellner ended up with a job as a key-punch operator.

The Kellners were married while finishing school. Charlie majored in physics, discovering just too late to change majors that his true interest lay in computer science. When they had a child, Jo chose to stop working, while Charlie pursued a career in computer engineering that eventually led to Apple. By the time their son Matthew was two, ready and eager to mix with people his own age, Jo was tired of not working. Nearly two years ago, she took the Hotline job at Apple.

Apple Made the Difference. "I always thought all jobs were hateful—until Apple. Because of the nature of the Hotline, there are moments of frustration; we all have to stand up and curse now and then! But the company recognizes that; that's why our offices look like they do. What other company would allow you to put an aquarium in your office?"

"Apple is human-oriented; we're free to be individuals. And that freedom breeds creativity. I can see it in Charlie's work."

"I never dread coming to work at Apple; in every other job I've had, I frequently did."

Jo Kellner believes there is no discrimination at Apple on any grounds.

"In the lab, there's a seventy-five-year-old man working beside an eighteen-year-old. They're both good—great—and they're fully appreciated."

"That goes for me, too. I feel privileged, not put down or discriminated against. Apple is the least biased as far as the people who work here of any company I know of."

The Answer Book. Jo Kellner is not letting her situation on the Hotline stand still. As the ranks of Apple owners grow, the calls will become too numerous to be handled. By that time, Kellner envisions regional Hotlines throughout the world. All of them will be helped by another creation of the Hotline, *The Answer Book*. Months of compiling the Hotline's most frequently asked questions have resulted in a large question-and-answer notebook, originally intended for dealers to aid them in answering customers' questions. But the customers so often inquired about purchasing a copy of their own that now they can ask their dealer to buy one for them. It's \$27, which reflects costs only.

"It's not a moneymaker," says Kellner; "it isn't intended to be. It's information we want disseminated. The book isn't even copyrighted."



Rilla Reynolds

Blond curls, wide blue eyes, small and delicate, Rilla Reynolds is anything but the stereotype of a programming engineer. And, perhaps partly because of that, for many of her working years she wasn't one.

Reynolds majored in the humanities in college, then got a job as a computer operator with a group that specialized in artificial intelligence. It was an exciting place to work, and, as time went on and Reynolds became involved in state-of-the-art

research in problem-solving, she began entering night classes in data processing. As a side effect, these brought Reynolds a rather rude awakening.

"I had no idea how important mathematics was," Reynolds confesses.

So she extended her night classes to include math.

The company recognized a growing person, and Reynolds was transferred into research analysis. There she took responsibility for projects, doing field work, reducing the data, writing a summary of the whole thing. "It was great," says Reynolds. "Having direct contact with clients was especially fun."

A Full-Time Commitment. And the more she enjoyed her work, the more she wanted to expand her knowledge. More night classes weren't feasible, but ten years solid working left her in a good position to do school right, if she liked.

She liked. Reynolds entered school full-time, if a little late, majoring in computer science. She liked microprocessor, graphics, and telecommunications classes best, in that order; so, when she realized she was about to return to her old job, one of her professors told her about Apple.

In her micro class, Reynolds had preferred the Apple to the other computers, especially because of its color graphics potential. She applied for a job at Apple and got it.

"As a woman in science, you run into obstacles; but not at Apple," according to Reynolds. "Apple is a self-motivated place. I feel lucky to be working with people like these."

And Reynolds, it would seem obvious, is a self-motivated person who did her homework with pleasure—plenty of it—before landing in the spot she finds near ideal. At Apple, her second love is satisfied, too. She specializes in graphics.

Work Is Play. Reynolds has a theory about why Apple Computer Inc. and the people who comprise it are successful; it's one of the reasons she enjoys working there so much: "It's play," she declares, "almost everyone here is playing." Not role-playing or game-playing in the sense psychologists like to use it, but simple, joyful, having-fun play.

Someone else at Apple cited Steve Jobs as having the philosophy that when your work's no longer fun, it's time to move on.

Certainly for Rilla Reynolds, and, according to her observation, for many people at Apple, that time is a long way off.



Pat Marriott

If you were looking for a person who thought like a choreographer or managed like a motion picture producer, a computer manufacturer probably wouldn't be the first place you'd look. Yet at Apple Computer, you'd find just such a person in the position of product manager.

The product manager is to the development of a system software product what the choreographer is to a ballet or the producer to a movie: she champions the product from day of inception through production and marketing to update and service. She coordinates all the people involved in product development, determines who will be the users, coordinates the software with other products, plans what the price will be—in short, oversees every aspect of the making of the product.

A Micro Company. "It's like managing a little company of which the current project is the only product," says Pat Marriott, product manager on such systems as *Apple Pascal*, *Apple Fortran*, and *Apple Pilot*.

"I've never worked harder," she explains, "but I wouldn't

want to be anywhere else. Coming to Apple was the best decision I've ever made."

Since taking the bachelor's degree in electrical engineering and physics and the master's degree in computer science, Marriott had spent most of her working life in software development, always on the technical end. Lurking inside her was a leaning toward marketing, although she had no experience in the area. But program writing was "getting old."

At the time, Marriott was at Hewlett-Packard working under John Couch. Marriott saw the time as right to change jobs; and if she was changing her job, she might as well change her field, she reasoned.

Apple Offered Road Not Taken. Marriott interviewed at many companies, expressing her desire to move into marketing. At every one, she heard variations on the same theme: "If you want product management, there's a tried and true path."

After a short stint at IBM, Marriott spoke with Couch, who had by then moved to Apple. He suggested she interview there.

Once again, it was Mike Markkula at Apple who did the unexpected and scored. Markkula hired Marriott as manager of marketing research and planning, despite her total lack of marketing experience. He believed she could do it; and he was right.

After very few months, Steve Jobs, cofounder of Apple with Steve Wozniak, asked Marriott if she'd like to be a product manager—Apple had only two or three people in the position at the time. Marriott declined, feeling she had not been long enough in her current position.

That was that—for a week. Then Jobs called her back. "You made the wrong decision," he announced, and encouraged her to become a product manager in spite of herself.

How did Marriott feel about that? "He was right, so right." And it became clear almost immediately. "You learn by taking risks. If you're scared, and people say 'Go ahead anyway'—you do, and you can."

The Flavor of Apple Inc. Marriott and many others who have been at Apple a relatively long time have joined in a task force devoted to spreading the spirit and meaning of life at Apple to new employees.

"There's a spirit at Apple—I think it grows out of the conviction that we are doing the right things, making a quality product—making a dent in the universe. The people here are great; the concept of quality is pervasive, from people to product and back again.

"Our group is a task force on Apple life and culture. Apple has something special; our purpose is to understand that quality and how to keep it; and how to pass it on to new people."

And the Beat Goes On. The goal becomes more and more difficult as Apple Computer grows larger; so far, it's still working. When Marriott says, "Every new generation gets the spirit," she's describing more than perhaps even she realizes.

For that special Apple spirit is evident by phone when one speaks to Apple Computer people in Boston or Charlotte as well as in Cupertino. The task force's efforts aren't blunted by miles; or perhaps the computer itself really is a magic Apple.

the wont of women who truly love their stepchildren.

The Americanization of Eileen. After six years of persuading, Eileen's husband, an American stationed with the military in England, succeeded in uprooting his wife and moving his family to America. That was four years ago. She's gloried in the northern California sun and freedom ever since.

"I love the people, the climate; I'd never go back to England—except to visit. If ever I had imagined what America would be like, it wouldn't have taken me a moment to move!"

California life got to Forest in other ways as well. "Especially after the English formality, I found the casual atmosphere leading to the desire to be creative." Less than a year after the move, she felt the need to change her routine.

"After seven years of total family focus, I needed a break from it all. I decided to work."

Her first job was with an international pharmaceutical firm; after six months, she was transferred to marketing, and she hated it. "I lost my self-confidence; I liked the company, but I was buried in the marketing department."

A New Association. So Forest went to an employment agency that sent her to Apple to interview for a job as secretary—called associate at Apple—to Mike Markkula, vice-president of marketing.

As could not be otherwise with a personality such as Eileen Forest's, she interviewed Apple.

"As soon as I met Mike Markkula, I knew this was the position for me. I was overwhelmed. He is so creative, so stimulating. He gives you a hand, but he lets you fall on your face, too.

"Nothing's ever bad to Mike; you can come to him with the disastrous results of an idea that totally flopped and he'll say, 'Maybe you should have done it this way. . . .'

"I still like to pass things through him. He's usually right."

He's now chairman of the board of Apple and executive vice-president on the president's staff. When Markkula made the move from marketing leader, he gave Forest her choice of directions to go. With interests pulling her in several ways,



Eileen Forest

Eileen Forest loves to cook, and for many years, cook she did for husband and five children in her native England—plus performing all the other tasks expected of wife and mother. As with many women, her life centered around her family; it is likely she gave even more of herself than most women, as is

Forest asked if she could take on more than one option.

"Give it a try," said Markkula.

Forest had always pitched in with the company social arrangements—and Apple has plenty. Now she officially plans company parties; and she takes responsibility for arranging Apple employee meetings and use of a racquetball club in which Apple maintains memberships for all employees.

Translating the Apple. But Forest's primary function now is that of international marketing and communications liaison for Apple International, the new name for the recently acquired Eurapple. In this capacity, she does studies on such problems as where most efficiently to print foreign language manuals and how to distribute corporate efforts; the major immediate thrust is creating open communications and material lines between domestic Apple and European Apple, seeing that Europe gets promotional materials, literature, and manuals. The Apple manuals are currently being translated into the European languages.

Although she didn't like leaving Markkula and still interfaces with him as much as possible, Forest is delighted with her new positions. She is even more delighted that Apple encourages an employee of any age or sex to rise from the ranks.

"It's super to work at Apple," enthuses the Americanized Forest; then she adds, with perfect British understatement, "Why, it's almost fun to work here."

"In fact," with some surprise, "my day at Apple is really as important as being at home. I have to make a total switch at the end of the day. Suddenly I'll think, 'Oh, I've got to get home and feed the kids!'"

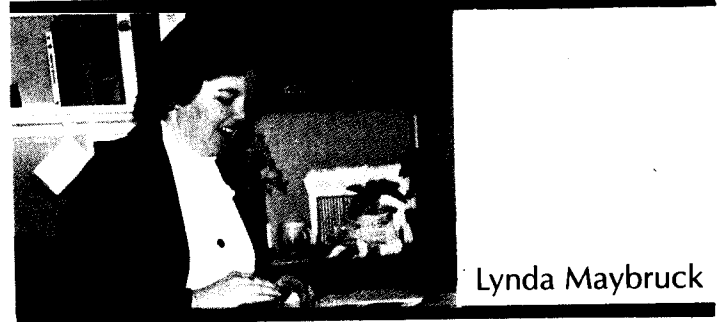
A Family Affair. With husband Bob now also working at Apple, as quality assurance analyst, Forest's family is adjusting to her busy schedule. "The kids actually pick up and do the things I don't get done now. It took a while, but it was my own fault. I used to do everything for them." Now the family finds themselves eating dinner out more and more.

The rest of the time, Forest still loves to cook, only now she

follows recipes—mostly her own—from the screen of a monitor, generated by her family Apple. The same Apple handles the family's bank account, plays numerous games, and helps with one child's Spanish and another's math homework.

"Then, of course, there's my hobby. I've become devoted to playing tennis. Three nights a week and often on Saturday mornings. . . ."

Perhaps, if we revisited Eileen Forest in a month or two, she would have found something more to do with her time.



Lynda Maybruck

Despite its size—approximately eight-feet square, like most at Apple—Lynda Maybruck's office gives the effect of being a thoroughly efficient working area and conference room combined. Part of the effect is the result of a round white table, clear of clutter, with a chair; but most of the effect comes from the woman in residence.

Magnet for Responsibility. Maybruck, whose official title is product literature specialist, keeps fingers in many pies. Besides seeing to the dissemination of product promotional literature, she has adopted many of the data processing functions of marketing services to manage, oversees maintenance of the warranty file and dealer support files, deals with sales and with dealers, and acts as liaison with mailing houses.

GOTO 38

THE PASCAL PATH

By Jim Merritt

More First Steps

The Power of Names. Did you ever stop to think about the many smaller tasks and actions you must perform to place a telephone call? You surely did when you first learned how to use a phone, but that was probably so long ago that you retain no conception of the process as a sequence of individual events. Now, you place a phone call. A long time ago, perhaps you thought of it this way:

1. Pick up the handset.
2. Listen for the dial tone. If there is none after a few seconds, skip to step 8.
3. Dial the number.
4. If you hear the busy tone, skip to step 8.
5. If you hear the ringing tone, wait for ten rings or until the party answers, whichever is first.
6. If the party has not answered, skip to step 8.
7. Have your conversation.
8. Hang up the handset.
9. If you've stopped your call because of a problem and would like to try again immediately, return to step 1.
10. You're done.

Your earliest attempts at placing calls were probably tedious, because you had to spend much time and effort concentrating on all the tiny, individual steps involved. After a while,

placing a call became an habitual, nearly automatic action for you, as does any frequently practiced task. You think something like "I want to place a phone call," and then you *do* it. At this stage, you have not only learned to do something quickly, by habit, but you are able to refer to it quickly, using an abbreviated phrase or special name.

A computer acquires skills in much the same fashion. Initially, a programmer must spend time devising the highly detailed instructions the computer must have to perform a given task. Of course, the computer needs no time or repetition to habituate itself to something new; as soon as it has been given a correct program, it can handle the associated process. Perhaps most important, the new program is given a *name*. The name can be used to substitute for all the original program's many steps. Thus, the computer system and the programmer can treat a complicated series of steps as a single conceptual unit, a unit that can be used in the development of other programs.

Just as a new human activity might include placing a phone call as one of its steps, so a new program might call upon a previous program, *PlacePhoneCall*, to perform a crucial task. In either human affairs or computer programming, it would be very impractical if we were forced to spell out all the details of every step in a task each time we wanted that task performed. Given such a restriction, descriptions of complicated activities, or large, powerful computer programs, could be produced only with the greatest difficulty. The ability to refer to a procedure by some name, preferably one that indicates the action described by the procedure, is as essential to the development of computer programs as it is in daily life.

Identifiers. In Apple Pascal, the name given to a program is one example of the general concept of an *identifier*. An identifier may consist of any number of letters or digits, but its first character *must* be a letter. Apple Pascal makes no distinction between upper-case and lower-case letters in identifiers. For example, these two identifiers are identical:

abc ABC

Here are some typical identifiers, each of which could be used to name a program:

Azimuth	FindCustomer
GetNumber	String2Integer
CubeRoot	GeneralLedger
Program5	VerifyKey

The Pascal language includes a group of *reserved words* that look similar to but are *not* and cannot be used as identifiers. *PROGRAM* is a Pascal reserved word. You cannot have a program named *PROGRAM*. All reserved words have special meanings and must be used only in special ways within Pascal programs. To help you distinguish them, identifiers will be shown in mixed upper-case and lower-case letters—for example, "MashTrash"—and reserved words will be shown in upper-case only—for example, "END".

Here are some illegal identifiers with an explanation of the principles they violate:

7Up	Identifier may not begin with a digit.
Begin	BEGIN is a Pascal keyword and can't be an identifier.
Jack&Jill	Identifiers may contain only letters and digits.
Post Accts	An identifier may not contain a space; the space is one of the characters that marks the end of an identifier.

Apple Pascal permits you to name things with identifiers of any length. However, only the first eight characters in an identifier are *significant*; remaining characters are ignored. Identifiers must therefore differ in their first eight characters in order to be considered as separate and distinct. The identifiers *PayrollR*, *PayrollRecord*, and *PayrollRoster* are the same, as far as Apple Pascal is concerned, though other Pascal systems may recognize their differences.

Our First Programs. The *statement* is the unit of action in Pascal. The compiler translates one statement into several more primitive computer instructions. A complete Pascal program is a mixture of statements and special *framing information*, which the compiler uses to organize the statements and other objects in the program. The simplest program possible in Apple Pascal is merely an empty frame, containing no statements:

```
PROGRAM Sample;
BEGIN
END.
```

If the compiler generates any object program at all from this source, its only function will be to return control of the computer to the operating system. "Sample" performs no real work. Nevertheless, it does illustrate some of Pascal's *syntax rules*, the rules that govern the formation of programs.

For example, every program must begin with a *program heading*, which consists of the reserved word *PROGRAM*, followed by the identifier that you choose as the program's name (in this case, "Sample"), and then a semicolon.

The reserved word *BEGIN* tells the compiler that the statements that constitute the program follow; and the reserved word *END*, followed by a period, marks the physical end of the program. Therefore, the statements in a program must be placed between that *BEGIN* and *END* pair.

At this point, it's probably best to mention that the Pascal compiler ignores the format—the physical arrangement—of your program, except that such things as reserved words and punctuation must be in the proper order. Pascal is a free-format language, so the compiler would recognize the following programs as exactly equivalent to our first "Sample":

```
PROGRAM Sample; BEGIN END.
```

```
PROGRAM Sample; BEGIN
END.
```

```
PROGRAM Sample;
  BEGIN END.
```

```
PROGRAM
Sample
;
BEGIN
END
```

Remember, Apple Pascal makes no distinction between upper-case and lower-case letters, in either reserved words or identifiers. To the compiler, the following examples are identical to each other and to previous versions of "Sample":

```
program sample;
begin
end.
```

```
Program Sample;
  Begin
  End.
```

```
PrOgRaM sAmPIE; beGI n eNd.
```

```
PROGRAM SAMPLE;
BEGIN
END.
```

Since "Sample" does nothing, as there are no statements between its *BEGIN* and *END*., the program is of very limited interest. The following program, when executed, will calcu-

late and display the value of a simple arithmetic expression:

```
PROGRAM TwoAndTwo;
BEGIN
  WriteLn(2+2)
END.
```

The Pascal statement *WriteLn* causes the information specified within the parentheses to be displayed on a single line. For "TwoAndTwo," the information to be displayed is the numeric value of the expression $2 + 2$, or 4.

You may also issue the *WriteLn* statement with no parentheses. This causes a blank line to be displayed, as in the following example, which we'll compile as our first program next time:

```
PROGRAM SomeExpressions;
BEGIN
  WriteLn(2+2);
  WriteLn;
  WriteLn(2-2);
  WriteLn;
  WriteLn(2*2)
END.
```

Executing "SomeExpressions" produces the following:

```
4
0
4
```

About the Semicolon. You may be wondering why I placed a semicolon after every statement but the last in "SomeExpressions." When there are two or more statements in a program, the rules of Pascal require that a semicolon be used to separate them. Because there is no statement following the last one, no semicolon is needed between the last statement and the terminating *END*. However, it is legal to put a semicolon there, since Pascal includes the concept of a *null*, or empty, statement. "Sample" is an example of a program that contains only the null statement between *BEGIN* and *END*.

Many Pascal programmers prefer to put a semicolon after the last statement because there is always the chance that, at some future time, we will wish to add more statements at the end of the program. If you extend a program without placing a semicolon after the statement that was previously the last one, the compiler will detect a syntax error at that point, and cease compilation. This column will observe the practice of putting a redundant semicolon after the last statement in a program in all future examples.

The proper use of the semicolon is one of the biggest sources of confusion for beginning Pascal programmers, especially because it is used to separate not only statements but other language elements, which you will soon learn. The Pascal Path will try to anticipate any difficulty you may have with this bit of punctuation, and will address each potential problem as it arises.

Retracing the Steps

1. You can certainly find holes in the "call placing" procedure described earlier. There were some situations, such as wrong numbers, that were ignored deliberately because they made the example unnecessarily complex. Other omissions were made unconsciously. For practice, try to tighten up the example by going into greater detail, handling more problem areas, and so on.

2. Try devising a step-by-step procedure for another common activity. Start small—even simple things can be unexpectedly complicated. Analyze your procedure to see whether it addresses all the possibilities. If not, note whether your procedure's incompleteness was due to mere oversight or was consciously chosen to avoid certain areas of the problem. You should be able to justify any design decisions you made.

3. The identifiers "TwoAndTwo" and "SomeExpressions" each contain more than eight characters. Determine which characters in each will be ignored by the Apple Pascal compiler, then try thinking of other identifiers the compiler would treat as identical to one or the other of these two.

4. According to our convention, is "WriteLn" a reserved word or an identifier? Be sure you understand this, as it is an important distinction. ■

OPEN DISCUSSION

Intervene To Stop Interference

A little over a year ago, my three sons chipped in and bought a 48K Apple II for me. It was a gift for my seventieth birthday.

When I have my Apple turned on and my wife turns on the television set, there is strong interference with the television picture. If I turn off the Apple, the TV picture clears up. I have read that you have a method of correcting this problem. Could you give me the details?

I have lost a lot of hearing and sight in one eye. I went to a local Apple club when I first got my Apple, but because of the hearing loss, I was not able to get much out of the discussion.

I need help with understanding some aspects of programming and would like to join a club that I could participate in by mail. Could you give me a list of two or three that might be suitable? I don't have a disk drive so the program material I could get would have to include tapes.

I subscribe to *Softside* magazine. I liked it very much when they had an Apple edition. The new format, where mostly TRS 80 programs are listed, has turned me off and I would like to know if there is a similar magazine just for the Apple. I use my machine just for games, and fun, but I would like to make a few programs and my ability is very limited.

Anything you can do to help me solve these problems will increase my use and pleasure of the Apple many times.

Leonard Korney, Los Angeles, CA

If there is a cable service available in your area of Los Angeles, hooking up to the cable will eliminate the interference. If that's not feasible, make sure you have a good outside antenna hooked to your television.

Other than these, we cannot find a surefire method of overcoming television interference; a Level 1 Apple service may be able to help by adding shielding and other provisions Apple offers. Making sure the computer and the television are on different electrical circuits also could help.

Recommendations from other readers who may have found methods of cutting down on radio frequency interference are welcome. We'll run all valid suggestions in Open Discussion.

Also, if there are any clubs-by-mail in which Mr. Korney may participate, please write about yourselves to this column.

Companies who still produce cassettes, please call Softalk for the address to which to send catalogs for Mr. Korney.

There are several magazines strictly for the Apple. Being unfamiliar with the old-format Softside, we cannot tell you which will best replace it, but here are the ones we know about. The magazine you are reading is one, and you have a subscription to it just for having written to us. Nibble features program listings to be input as well as reviews and information. Peelings II is entirely reviews. Call A.P.P.L.E. does a fine job of making programming and user tips easy to understand if you have a little basic knowledge. Apple Orchard, a quarterly, also has programming information and news of user groups.

Whys and Wherefores

I really like your top thirty list, which has helped me in choosing two programs already. I'm only thirteen and taking a course on Basic in school—I've pretty well mastered it—and am very interested in the Assembly Lines article.

I have a question for you: why do back issues cost two dollars if a subscription is free?

Another question: how many DOSs is Apple going to have before they are satisfied? Lastly, could you recommend a good book that explains the monitor to a mediocre Basic programmer? Keep up the good work!

Matthew Machlis, Temple City, CA

When the regular monthly mailing of the magazine is done, many thousand magazines are mailed at once, with labels printed all at once by our Apple and labelled and sorted in zip

code order by machine, at a special rate for magazines that depends on mailing in bulk. To mail a back issue to one individual requires putting the magazine in an envelope, hand-labeling it, and mailing it first-class; then the postage alone comes to more than fifty cents and increases each time the magazine grows a few pages. Two dollars doesn't cover the cost of this process if you break down the employees' time spent.

Also, while Softalk offers complimentary subscriptions to all Apple owners, we cannot be responsible for any Apple owners missing Softalk if they haven't made themselves known to us. We are not in any way connected with Apple Computer Inc. and have no direct means of finding all the Apple owners unless they write or call us.

When Apple Computer brings out a new DOS or any new enhancement to their products, they are making available something they've discovered since the older model was marketed. If they had held back release of the Apple until they were sure no enhancements could ever be made no matter what new things should be discovered—well, we'd still be waiting for the first Apple. It's our opinion that Apple Computer Inc. has gone far beyond other companies in considering owners of older model Apple products. No new hardware product that Apple has brought out is incompatible with older products and software, including the Apple III.

Addressing the Companies

A short suggestion: can you include the address of companies whose product you comment upon—such as Telephone Software Connection in Torrance, CA?

Paul Raymer, Las Vegas, CO

It's our belief that the retailer is a very important contributor to the growth and health of the microcomputer industry; this is why we encourage Softalk readers to patronize their re-

O P E N D I S C U S S I O N

tail computer stores in preference to buying direct from distributors or publishers. Incidentally, there is seldom any savings in buying direct. It is to discourage bypassing your local retailer that we don't include the full address of publishers and manufacturers. We do include city and state to enable you to locate the company if you cannot find the product you wish through your store.

Since it is also to the advantage of new publishers to find retail distribution for their products, it helps them if you request your retailer to order their products for you.

The Telephone Software Connection is an exception to all these rules. We believe this company is a harbinger of the future. TSC sells software by modem: not only are orders taken this way, but the software you wish is downloaded directly to your own disk via the modem when you order. A few years from now, most retailers will probably offer this service, and much software will be written to accommodate it.

Ironically, you chose as an example of our address omission the one company whose address we gave in full; indeed, TSC's address is its telephone number.

Maintaining Detente

We are a two-Apple family—one here, one in Europe—so two issues of *Softalk* are a must. Primarily purchased for business applications, both have dual personalities—business when necessary, fun and games when time permits.

Please keep both our copies of *Softalk* coming to avoid an international incident.

Martin S. Cooney, Fort Worth, TX

Call to Users in Upstate New York

I am trying to form a local Apple user group here in Platts-

burgh, but since there is no Apple dealer here—yet—it's difficult to find other Apple owners. I hope that you will let me use the Open Discussion pages of your magazine as a medium to publicize my search.

If there is anyone in the Plattsburgh or western Lake Champlain region interested in starting a user group, please write to: Steve Adams, RFD #1, Box 432, Plattsburgh, NY 12901; or call (518) 561-8100.

Steve Adams, Plattsburgh, NY

Constructive Software

We publish a construction trade magazine, *Contractor/Estimator* magazine, that has a regular column on using computers in the construction industry. We are also putting together a directory of software available for the construction industry. We would like to hear from anyone who is selling software packages for the construction or related industries—civil engineering, architecture, subcontractors, etc. We would also like to hear from end users who are using either commercial software packages or self-written software.

Please send correspondences to: Gregory A. Kunz, *Contractor/Estimator* Magazine, Craftsman Book Company, 542 Stevens Avenue, Solana Beach, CA 92075.

Gregory Kunz, Solana Beach, CA

More Help for Tired Eyes

I have found that the sun screen material found in auto stores works well for cutting down on glare. My television screen, like many others, is curved—which makes it next to impossible to apply the material smoothly. I have an old piece of plexi-glass that I have applied the material to. Now when I want to use my computer, all I have to do is fasten the plexi-glass to my television screen, and the glare is gone.

Randy Reeves, Cypress, TX

In your January 1981 Open Discussion, your answer to tired eyes was to apply a warm cloth and buy a new monitor (\$325) with a green background. I use a trick that tired eyes might like to hear about.

I bought a light green sheet of plastic—the kind called Gel that's put over stage lights—from my art supply store and taped it over my monitor. Works for me.

Stephen R. Bosustow, Malibu, CA

A Letter to Roger Wagner

Yesterday I received my first issue [of *Softalk*], January 1981, and read through your *Assembly Lines*, Part 4. It appears to be just what I need, but starting with Part 4 is just like coming in on the middle of a movie. The November and December issues of *Softalk* are sold out and not available anywhere. Is there any way I can obtain copies of Parts 1 through 3? I will be glad to pay any reasonable price. Xerox is fine.

If I have enclosed a self-addressed, stamped envelope for your use in replying or whatever.

C. V. Fields, Sacramento, CA

Assembly Lines has prompted many requests for back issues of *Softalk*, and it's true that November and December are sold out. January, by the way, is running low.

As explained in our indicia, a back issue from October—for Part 1—costs two dollars, a fee required to cover special handling and first class postage—see the answer to *Whys and Wherefores* elsewhere in this column. With Roger Wagner's agreement, photocopies of parts 2 and 3 (November and December) are available for a stamped, self-addressed envelope and fifty cents to cover photocopying costs and handling. Since we anticipate several requests for these, we cannot guarantee how quickly we can get them to you. We are still small staffed, and publishing the next issue of *Softalk* comes first. ■



Limerick Contest

from page 3

Here are the ten Limericks chosen as finalists from January's contest. The final winner will be chosen by a vote of *Softalk's* readers. Vote for your favorite by its number on a postcard or note and mail to *Softalk's* Best Limerick, 10761 Burbank Boulevard, North Hollywood, CA 91601. The limericks are purposely not identified by author to avoid pre-judgment. In no particular order, the authors are Boris Karaman, Philadelphia, PA; Mike Leavitt, Reston, VA; Clayton E. Ruth, Dyner, IN; Daniel Miller, Worcester, MA; Paul J. Friedman, La Jolla, CA; G. Bass, Williamsburg, VA; Eric Marks, Mount Tabor, NJ; Francis Degrosse, Danbury, CT; and Greg Biel, Marshall, TX. Which limerick goes with which author will be revealed after voting deadline April 8, 1981.

1. My wife spent last week in the loft.
I know she's alive; she just coughed.
She has found no new suitor;
It's that Apple computer:
I'm afraid that she's gone micro soft.
2. There was an eccentric professor
Who swallowed a microprocessor
Now he's a computer,
This avant-garde tutor,
An Apple I guess more or lesser.
3. I'm on line with some guy in Moldavia
Who's exhibiting most odd behavia.
He just told me, in Hex,
That he's Oedipus Rex.
(But last week he told me he's the Savia.)
4. My brother, named Ed, had a fight,
For a woman whose honor was bright.
Asked he, "Was I wrong
To ring that guy's gong?"
"No," I said, "Ed, you were right."
5. There once was a wizard, a rake,
Who hunted a Princess to take.
This story's on line.
The game is just fine.
But how do I get past the snake?!
6. I have a strange pet crow named Ben,
Likes to bet on the ponies to win;
A parimutuel bird.
And though it's absurd,
My crow's off to the races again!
7. A bitter bad bettor named Bicks
Bought an Apple to bolster his picks
Soon the byte-booting rookie's
Bets bested the bookies,
Bringing bullion, both barrels, and bricks.
8. (This limerick's author is a physician.)
First we looked for the Lost Dutchman's cactus
And then Dogflight came on and attacked us.
Now we find with dismay
That an Apple a day
Keeps the doctor away from his practice.
9. The programmer's eyes were like fire.
Machine language codes roused his ire.
He grumbled, "I hate 'em!"
(That was almost verbatim.)
"Oh, give me a language that's higher!"
10. When putting a thought into verse,
A writer must frequently curse.
For it takes a long time
To make a verse rhyme,
And not make it sound any worse.

Assembly Lines

by Roger Wagner

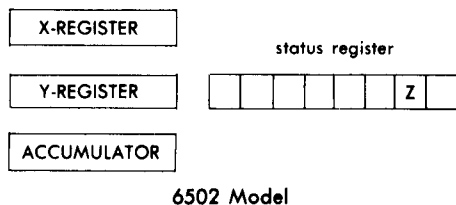
Everyone's Guide to Assembly Language, Part 6

Commands Covered So Far:

JSR	LDA	LDX	LDY	TAX
RTS	STA	STX	STY	TAY
INC	—	INX	INY	TXA
DEC	—	DEX	DEY	TYA
BEQ	BNE	JMP		

Welcome back! I hope you share my feeling at this point that we're starting to get to where we can actually do some interesting things with what we know so far. In fact, if you have short programs you've written using the commands we've covered so far, this month is your chance to send them to me, via *Softalk*. Your program may qualify for a new contest, the details of which are given at the bottom of this page.

Now, on to this month's endeavors!



ROGER HAS A CONTEST

Contest Rules

Create the shortest possible program using *all* and only the commands presented thus far in this series that does something interesting. The program must be entirely in machine language, and may not call any routines in Integer or Apple-soft. It may call any of the Monitor routines from \$F000-\$FFFF.

The person who submits the shortest program of the most interest will be awarded \$50 worth of product from any advertiser in this issue of *Softalk* and the program will be published in *Softalk*.

Judging will be based on the opinions of a rather subjectively selected panel made up of people at *Softalk*, myself, and any other hapless passersby we can rope into this thing. Members of the staffs of *Softalk* and *Southwestern Data Systems* and professional programmers are not eligible to win. Entries should be submitted no later than April 15, 1981. Ties will be settled by Apple's random number generator. (I promise not to seed it!)

Mail entries to Roger's Contest, 10761 Burbank Boulevard #6, North Hollywood, CA 91601. ■

The basic ideas you should be comfortable with at this point are fairly simple. The 6502 microprocessor is our main operational unit. There are three main registers: The accumulator and the X and Y registers. Also present is the status register, which holds a number of one-bit flags to indicate various conditions. So far, the only one we've considered is the Z-flag, for indicating whether a zero or nonzero number is present in one of the other three registers.

Programs are executed by the 6502 scanning through memory. Addresses in memory are analogous to line numbers in Basic. A JSR \$FC58 in machine language is just as valid as a GOSUB 1000 in Basic. In using an assembler, we can give names to routines at given addresses and make things that much simpler by saying JSR HOME, when HOME has been defined as \$FC58.

Last month, we used testing commands like BEQ and BNE to create simple loops. We used the X and Y registers as counters, and incremented or decremented by one for each cycle of the loop.

Now let's expand our repertoire of commands by adding some new ones and, in the process, add some flexibility to what we can do with loops and tests in general.

In our previous programs, we relied on our counters reaching zero and testing via the Z-flag to take appropriate action. Suppose, however, that you wish to test for a value other than zero. This is done using two new ideas.

The first is the compare command, the mnemonic for which is CMP. This tells the computer to compare the contents of the accumulator against some other value. The other value can be specified in a variety of ways. A simple test against a specific value would look like this:

```
CMP #A0
```

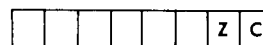
This would be read, "Compare accumulator with an immediate A0." This would tell the 6502 to compare the accumulator with the specific value \$A0.

On the other hand, we may want to compare the accumulator with the *contents* of a given memory location. This would be indicated by:

```
CMP $A0
```

In this case, the 6502 would go to location \$A0, see what was there, and compare that to the accumulator. It is important to understand that the contents of \$A0 may be anything from \$00 to \$FF, and it is against this value that the accumulator will be compared. In each case, the comparison is done by subtracting the accumulator from the specified value.

The second important idea is that of the Carry flag. This enables us to determine the result of the comparison. Right next to the Z-flag in the status register is the bit called the Carry.



This is used during addition and subtraction by the 6502. In our case, since the compare operation involves subtraction, the Carry flag can be used to test the result. You do this with two new branch commands, BCC and BCS. BCC stands for Branch Carry Clear. If the accumulator is less than the value compared against, BCC will branch appropriately. BCS stands for Branch Carry Set and is taken whenever the accumulator is equal to or greater than the value used.

This means that we can now not only test for specific values but also test for ranges. Try these examples:


```

*****
* PADDLE PROG. 2A *
*****
*
  OBJ $300
  ORG $300
*
PREAD EQU $FB1E
HOME EQU $FC58
COUT EQU $FDED
*
START JSR HOME
  LDX #$00
LOOP JSR PREAD
  TYA
  CMP #$C1; CMP TO ASCII VAL FOR "A"
  BCC LOOP; TRY AGAIN IF LESS THAN
  CMP #$DB; CMP TO ASCII VAL FOR "]" (Z+1)
  BCS LOOP
  JSR COUT
  JMP LOOP
* INF. LOOP

```

When assembled and listed from memory, it should look like this:

```

*300L
0300- 20 58 FC   JSR  $FC58
0303- A2 00     LDX  #$00
0305- 20 1E FB   JSR  $FB1E
0308- 98       TYA
0309- C9 C1     CMP  #$C1
030B- 90 F8     BCC  $0305
030D- C9 DB     CMP  #$DB
030F- B0 F4     BCS  $0305
0311- 20 ED FD   JSR  $FDED
0314- 4C 05 03   JMP  $0305

```

Let's step through the program. After the JSR to the clear screen routine, we load X with zero in preparation for reading a paddle. The #\$00 will tell the routine that we wish to read paddle 0. After the read, the answer is returned in the Y register, which we transfer to the accumulator with a TYA. It is at this point that we use our *filter*. If the accumulator is less than the ASCII value for the letter A, we avoid the printout by going back to LOOP. I have used the ASCII value for A plus \$80 so that we get normal output on the screen. If you test for \$41 instead, flashing characters will be output to the screen.

The next comparison is for the ASCII value for the character Z. This is so that the BCS will catch all values higher than the one for Z. The chart in the newest edition of the *Apple Reference Manual* (page 7) is also useful in seeing where these numbers come from.

Only numbers from \$C1 to \$DA will make it through to be printed out using COUT (\$FDED).

Again the loop is infinite, so reset is required to exit.

The X and Y registers can also be compared in a similar manner by the codes CPX and CPY. Can you rewrite this program to use CPY instead of CMP?

BEQ and BNE are also still usable after a compare operation. Here's a summary:

Command	Action
CMP	Compares accumulator to something
CPX	Compares X register
CPY	Compares Y register
BCC	Branch if register < value
BEQ	Branch if register = value
BNE	Branch if register <> value
BCS	Branch if register >= value

As you may have noticed, I enjoy using the paddles as input devices. This is because they're an easy way of sending values from \$00 to \$FF into the system in a very smooth and natural way. We can get similar data from the keyboard, though. There the advantage is that we can jump from one value to another, with no transition between the two values.

A good part of many formal machine language courses deals with system I/O—that is, getting data in and out via different devices. Using the Monitor routines on the Apple simplifies this for us greatly because we don't have to do a lot of

I/O details. You've already shown this by using the paddles (\$FB1E) for input and the screen (\$FDED) for output without having to know anything about how the actual operation is carried out. The keyboard is even easier.

I mentioned in one of the first issues that the address range from \$C000 to \$FFFF is devoted to hardware, in that these memory ranges cannot be altered by running programs. (I'm ignoring the RAMcards for the time being.) The range from \$D000 to \$FFFF is used by the ROM routines that we've been calling. The range from \$L000 to \$CFFF is assigned to I/O devices. Typically the second digit (or maybe I should call it a *hexit*) from the left gives us the slot number of the device. For instance, if you have a printer in slot one, a look at \$C100 will reveal the machine language code in ROM on the card that makes it work. At \$C800 you'll probably find the code that makes the disk drive in slot six boot.

\$C000 to \$C0FF is reserved not for slot 0, but for doing special things with the hardware portions of the Apple itself.

An attempt to disassemble from \$C000 will not produce a recognizable listing, but it will probably cause your Apple to act a bit odd. This range is made up of a number of memory locations actually wired to physical parts of your Apple. If you type in:

```
* C030 <RETURN>
```

from the Monitor, in addition to getting some random value displayed the speaker should click. If it doesn't click the first time, try again. Each time you access \$C030, the speaker will click as it moves in response to your action.

The keyboard is also tied into a specific location. By looking at the contents of \$C000, you can tell if a key has been pressed. In Basic, it's done with a PEEK (-16384). (See page 6 of the new *Apple Reference Manual*.) In machine language, you would usually load a register with the contents of \$C000, such as:

```
LDA $C000
```

Because it is difficult to read the keyboard at exactly the instant someone has pressed the key, the keyboard is designed to hold the last key pressed until either another key is pressed or until you clear the *strobe* as it's called, by accessing an alternate memory location, \$C010. It is always a good idea to clear the keyboard when you're done with it, otherwise you may have a character hanging around, which will be picked up by whatever reads the keyboard next, such as an INPUT statement in Basic. Again, page 6 goes into more detail on this.

The last point to be aware of is that the keyboard is set up to tell you when a key is pressed by the value that is read at \$C000. Now, you might think that the logical way would be to keep \$A0 in \$C000. Perhaps, but that's not the way they did it. Instead, they add \$80 to whatever the ASCII value is of the key you pressed. If a value less than \$80 is at \$C000, it means a key has not been pressed.

So, to illustrate this (and I admit it got a little involved for my tastes), let's look at some sample programs to read data from the keyboard.

```
*****
* KEYBOARD PROG. 1A
*****
*
*   OBJ $300
*   ORG $300
*
*   KYBD EQU $C000
*   STROBE EQU $C010
*   COUT EQU $FDED
*
*   START JSR HOME
*   LOOP LDA KYBD
*         CMP #$80
*         BCC LOOP
*         JSR COUT
*         JMP LOP
*   * INF. LOO
```

Once entered, this should disassemble as:

```

*300L
0300- 20 58 FC JSR $FC58
0303- AD 00 C0 LDA $C000
0306- C9 80 CMP #$80
0308- 90 F9 BCC $0303
030A- 20 ED FD JSR $FDED
030D- 4C 03 03 JMP $0303

```

Trying this program, you should notice that the program runs on, printing the same character until you press another key. That's because we never cleared that strobe you thought I was rambling on about. Once the key press gets on the board, it's never cleared until it is replaced by a new key.

A better program is:

```

*****
* KEYBOARD PROG. 1
*****
*
OBJ $300
ORG $31 7 *
KYBD EQU $C000
STROBE EQU $C010
COUT EQU $FDED
*
START JSR HOME
LOOP LDA KY/ 14 CMP #$80
BCC LOOP
STA STROBE
JSR COUT
JMP LOOP
* INF. LOOP

```

which lists as:

```

*300L
0300- 20 58 FC JSR $FC58
0303- AD 00 C0 LDA $C000
0306- C9 80 CMP #$80
0308- 90 F9 BCC $0303
030-h D 10 C STA $C010
030D- 20 ED FD JSR $FDED
0310- 4C 03 03 JMP $0303

```

This should work better. Here we clear the keyboard whenever we've gotten a character and printed it. Why not clear it right after the read on line 14? If we did it there, we would have to be lucky enough to see the character at \$C000 just as the user pressed the key. In this case, we'd probably be able to do it because of the speed of the loop. However, if we had to go away to another routine for a while, or otherwise delay getting back to the LDA \$C000, we'd probably miss it.

You should also type in enough to wrap around onto the next line, and also try the arrow keys and <RETURN>. You may think this all performs as expected (with the exception of the missing cursor), but this all should not be taken for granted. Without the screen management of COUT, you'd have to do quite a bit more programming to keep things straight. Once more, this is the advantage of using the routines already present in the Monitor, rather than have to worry about the details yourself.

Also, please notice how the STA \$C010 is used to access the strobe. The important part is that we somehow access the strobe location, not how we do it. The STA was chosen because we didn't want to lose the contents of the accumulator in doing the access.

This information is a bit more about technique than actual commands, but is worth mentioning if you're going to get along with your Apple successfully.

Examine the chart on pages 130-131 of the *Apple Reference Manual* for a good listing of the soft switches and other goodies at \$C000-\$C0FF. These can be very useful in having your Apple relate to the outside world. You may wish to experiment with these in the contest. Also don't forget about all the routines listed on pages 61-64 of the same book. These can also be used in the contest, and may prove useful.

Next month, we'll put more of these together into some new programs. In the mean time, get to work!

TRADE TALK

□ The new position of national sales manager for **Microsoft Consumer Products** (Bellevue, WA) has been awarded to **Nicholas D. Roche**, lately of Commodore Business Machines, where he organized the chain of new Commodore retail stores. Roche's experience with micros includes a stint with Verbatim, during which he helped introduce their floppy disk line to computer specialty stores across the country. Roche will oversee dealer and user sales for Microsoft software. Before he entered the world of the personal computer, Roche served in management and sales positions at Proctor and Gamble and Memorex.

□ Not only has **Robwin Computing** moved to Marina Del Rey, CA, as was reported in this column last month, but the firm has traded in their name for one with a more descriptive image: **Softsel**. Robwin's—or Softsel's—growth continues unabated: Artsci, Acorn Software, Sierra Software, Softape, and Glos-tronics have been added to the distribution line of software and accessories in the past month.

□ A special computer show will be staged in Boston after the snows melt this June. **Applefest '81** is being sponsored by **Apple/Boston**, the user group of the Boston Computer Society. What makes it special is that the show is devoted exclusively to products compatible with the Apple computer, drawing purchasers and experts from around the world to the Plaza Castle, Arlington Street. Over one hundred exhibits of Apple-related products and services will take the center ring, supported by seminars discussing innovations and practical applications. Admission to the festival and seminars is three dollars per day. Dates and hours are Saturday, June 6, 11:00 AM to 7:00 PM and Sunday, June 7, 11:00 AM to 6:00 PM. For further information and tickets, write to The Boston Computer Society, Three Center Plaza, Boston, MA 02108, or call (617) 367-8080.

□ **Evan Scharf**, author of *TellStar*, has joined **Information Unlimited** (Berkeley, CA) as vice-president of marketing. Scharf is moving north from Los Angeles, where he has been marketing manager for General Automation for the past eight years.

□ **Micro Lab**, publisher of *Data Factory* and *Dogfight*, has moved to 3218 Skokie Valley Road, Highland Park, IL 60035. The company's new phone number is (312) 433-7550.

□ **Bruce Tucker**, the former manager of the computer department of McGraw-Hill Bookstore in New York City, has

moved across town to the Gotham-based **Computer Factory**, where he is serving as operations manager.

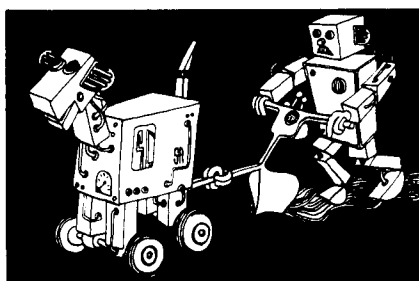
□ **Personal Software** (Sunnyvale, CA) has appointed **C. Gerald Diamond** as vice-president; his responsibilities will entail developing an international marketing program and managing OEM contract relationships for the company. Diamond has evidenced a worldly bent for the past twenty years as head of international business development and foreign and domestic site selection for Intel's international division and director of their corporate business development and as an international marketing consultant for technology corporations.

□ **Dakin5** (Denver, CO) is expanding its product line to include games, or, as the company prefers to call them, strategic situations. The new entertainment software will be marketed under the label **Level-10**.

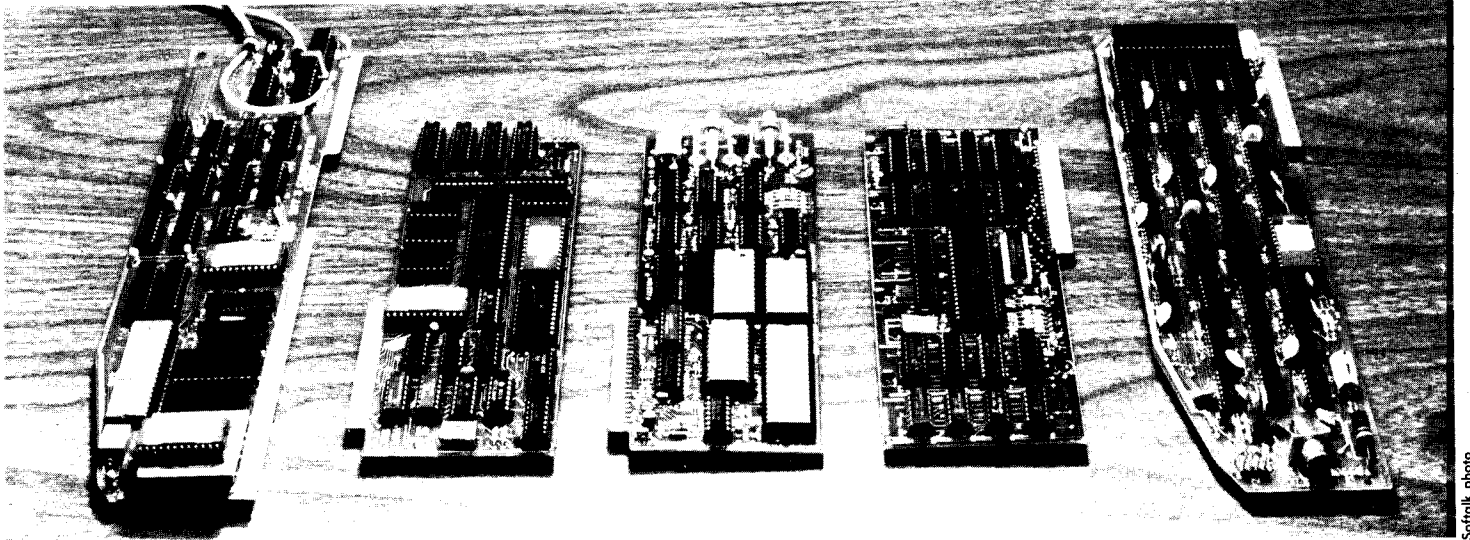
□ **Edu-Ware** (Woodland Hills, CA), who brought the world of *The Prisoner* to the Apple, has appointed **Wendy Peterson** their media director. She will be immediately involved in a significant repackaging of the firm's software, details of which will be announced soon.

□ Owners **Bill and Penny Hoffmann** have opened **The Software Store** at 16562 Gothard Street, Huntington Beach, CA. The Hoffmans, who were early purchasers of the Apple II in 1978, operate one of the original software-only retail outlets. Incidentally, the store is carrying all products advertised in *Softalk* or that appear in the monthly bestseller list.

□ "Computer Applications Using Database," a two-day class that will explore every aspect of data base applications software, will be conducted by **Micro Data Base Systems** (Lafayette, IN) on Monday and Tuesday, March 9 and 10, at the Coliseum Holiday Inn in New York City and on Thursday and Friday, March 12 and 13, at the Golden Gateway Holiday Inn in San Francisco. Contact **Sophie Chang** or **Veronika Whinston** at (317) 448-1616. ■



Snarskis/Shlvata/Vilnius/Reprinted
from World Press Review/November 1980



The five contenders, left to right: Full-View 80, Videoterm, Smarterm, DoubleVision, and Supe'R'Term.

Softalk photo

The Look with Character: 80-Column Boards for the Apple

BY JEFFREY MAZUR

The market for eighty-column boards has developed significantly this past year, with five companies introducing their products and vying for your dollars.

If you're considering purchasing one of the boards, you'll

find it important to learn the strong and weak points of each and to understand just what the boards will do—or require—in conjunction with your present system.

You'll also need to know just why you want the board, which will determine which features are important to you. The boards vary greatly in the characteristics they feature; what seemed most important to one manufacturer apparently ranked well down on the value scales of the others.

Even before considering the features, there are some general characteristics applying to all the boards of which you should be aware.

Common Grounds. The main purpose of the eighty-column boards is to represent better on screen the average piece of eight-and-a-half-by-eleven-inch paper. Such a piece of paper averages eighty typed characters per line, given some margins. Displaying twice the characters on each line as your normal Apple screen accomplishes this simulation.

But doubling the number of letters on the screen necessitates making each character physically smaller. This translates into higher frequencies in the video signal; as a result, it also requires a better monitor than normal Apple output can get along with.

Another important consideration is the means by which the video boards receive data from the computer. In the Apple, this is handled through a special memory location called the CSW vector or output hook. The contents of this location determine whether data is printed to the normal Apple screen, to an eighty-column board, or to a printer. A similar hook, called the KSW vector, exists for data entry, which normally points to the Apple keyboard.

These hooks are usually changed from Basic with the PR# and IN# commands. The video boards use both these hooks in their operation (the IN# hook is necessary for intercepting commands to the video board). This creates some restrictions when simultaneously using other boards such as a modem. A different kind of restriction is that control characters that are commands for the video boards usually become unavailable for program usage. Execution of the video board control character commands requires the CHR\$ function that, in Integer Basic, is available only with a special routine.

Monitor Required. Although all the board manufacturers suggest using only a wide bandwidth or high-resolution video monitor, many Apple owners will want to use their existing video displays. But if the display is being fed by an RF modulator, then you need a new monitor. The frequencies involved in an eighty-column display are impossible to transmit through a normal modulator and television front end.

However, a medium resolution monitor, such as a closed-circuit television or a black and white television modified for video input, will work adequately with most of the boards. The most common symptom of a too narrow bandwidth is that the vertical lines between characters will become much dimmer than the horizontal lines. This can be tolerated to a degree, but if the difference is too great, it can cause eyestrain. The Supe'R'Term board has a special video balance circuit that greatly minimizes this problem.

It's important to consider how much of the video field is actually used. The Apple forty-column display uses only about two-thirds of the video field. This makes it possible to use almost any monitor or television without worrying about losing characters at the edges of the screen. This screen area reduction also reduces the chance of blurry, bent, squashed, or similar defects in the characters at the screen's edge due to nonlinearities in the monitor's circuits. This is true of the Supe'R'Term, Videoterm, and Smarterm eighty-column boards, too. The other boards generally require some adjustments to the monitor's sweeps—horizontal width and vertical size—which might involve dismantling the set.

Each Has a Unique Character. Character legibility is an important consideration when looking at a video display. Look to see whether the lower case characters have true descenders: letters g, j, p, q, and y should drop below the baseline.

Another important sign of character quality is the size of the character cell. This is expressed as the number of horizontal and vertical dots in the matrix from which all the characters are formed.

The greater the number of horizontal dots per character,

the higher the frequency response requirement of the monitor to display it clearly. In fact, a five-by-seven character size may look better on a medium resolution monitor than a seven-by-nine character size. This consideration is secondary to your personal opinion about which character set looks better on your monitor. All are condensed letters, but some minimize this effect by reducing the character heights.

Note that most of the boards can display more characters than can be typed from the keyboard. Many of the boards offer extra character sets or fonts, which are either stored in the standard or optional ROM or loaded into RAM. A popular choice for an alternate character set is one with line-drawing graphics. This makes it easy, for example, to simulate business forms on the screen.

Will Your Old Software Work in Eighty Columns? Because the eighty-column boards use different techniques for storing and generating video, some of the familiar commands may not work properly with all the boards. VTABs, for example, won't work with the Full-View 80. Although the cursor can be moved anywhere on the screen with the GOTO XY command, this means that all VTABs in your existing programs will have to be changed. The home command is compatible only with the DoubleVision; the Supe'R'Term and Smarterm move the cursor home but do not clear the screen. The rest use a CTRL-L (Form Feed) to home and clear the screen. This means that all home commands must be changed to PRINT CHR\$(12).

The inverse command also has varying results when used with the different cards. The Videoterm and Full-View 80 do not support this command at all; the Supe'R'Term will display inverse alpha characters only (spaces remain black). The other two boards respond normally to this command.

Since the bit used for the flash mode on the Apple is reserved for selecting lower case and other characters, this mode is not supported on any eighty-column board. The DoubleVision and Smarterm will display the correct data in inverse but not flashing; the other boards will display lower case characters.

Capitalize Like a Typewriter. Note that all shift key modifications void the warranty on your Apple. All the boards except the Videoterm allow a simple one-wire modification of the Apple that makes the shift key work like it would on a normal typewriter.

This modification involves soldering a wire to a small circuit pad on the Apple keyboard by removing either the entire keyboard or two key tops. The other end of this wire connects to pin 4 of the game I/O connector or, in the case of DoubleVision, to a solder pad on the board. With the DoubleVision, it's a good idea to use a connector so the card can be removed without unsoldering. Any of these modifications should be performed only if you are competent at soldering and have the proper tools.

When connecting to the game I/O socket, use 30 gauge (wire-wrapping) wire and insert the stripped end of the wire into the fourth pin from the white dot. The paddle connector can then be placed in the socket on top of the wire. Videoterm supports a hardware shift key with optional Keyboard Enhancer.

Most video terminals use a cursor to indicate where the next character will be placed on the screen. The cursor takes the form of a flashing box or underline and can be moved over existing characters without concealing them. Many terminals allow the user to alter or program the cursor shape, size, and flash rate. Programming the cursor can be more useful than just selecting what looks best. If a cursor can be controlled from a program, then different cursors might be used to indicate the program status or the type of input data the program is expecting.

Some boards feature separate keyboard commands for altering the cursor; others make this possible only through machine language or Basic pokes. All allow programming of the cursor.

Switching Between Forty and Eighty. The eighty-column boards are separate from the normal forty-column and graphics displays generated internally by the Apple. In fact, when

the computer is first turned on, only the regular forty-column display will be functioning. The output from the video board must be initialized. All of the Apple's normal lo-res and hi-res graphics capabilities are still available, but only at the video connector on the back of the computer.

Thus, unless you have separate monitors to connect to the eighty-column and Apple video sources, you'll want some means of switching between the two. The Full-View 80 and Smarterm solve this problem with electronic switching via keyboard commands or software. The other boards need a manual switch that can be easily constructed. Videx manufactures a switchplate assembly for their board that installs neatly into one of the cutouts on the back of the Apple. This can be used, unmodified, with the DoubleVision board. By changing one connector, it can also be used with the Supe'R'Term.

Extra Helping of Characters. Because the video boards use the Apple's input hook to intercept their commands, it's a logical extension for them to include the ability to generate some of the characters not represented on the Apple keyboard. For example, the left bracket ([]) is used by Pascal and by some of the other remote computer systems that might be connected via a modem to the Apple. The braces ({, }) are also desirable in Pascal. Thus the following boards have included facilities for generating extra characters: Supe'R'Term—[,] ; Videoterm—[, { , } ; Full-View 80—[,] , { , } ; Smarterm—[, \ , _ , ' , { , } , ~ , <rubout> ,] , ^ , @ . The last three characters listed for the Smarterm are not new—they are available on any Apple keyboard as a shifted m, n, and p, respectively. However, when using the shift key modification on those boards that support it, the shift key is used to type the capital letters M, N, and P. Therefore, to get the old shifted characters, it is necessary first to toggle off the modified shift key mode, type the desired character, and then reenable the shift key. That's six keystrokes for just one character. With the Smarterm, this number has been cut in half.

The Speed of Printing. The Apple prints information to the screen and scrolls at a relatively high speed. Although the eighty-column boards generally go through more processing in accomplishing their functions, writing speed is not seriously affected. However, there is a two-to-one variance in speed among the boards; this criteria may become significant with programs that frequently update the screen.

To determine the relative actual writing speeds of the five eighty-column boards, a constant number of characters was printed to each board and timed. All figures are relative to the speed of the Apple forty-column display, which was arbitrarily assigned a value of 100. These are the results: Supe'R'Term, 45; Videoterm, 85; DoubleVision, 57; Full-View 80, 44; Smarterm, 75.

Some boards may produce flashing when the screen is being scrolled or updated continuously. This is a side-effect of the way these boards use the cursor. Makers of the Videoterm acknowledge this as a result of the fact that their board always has the cursor on. They consider this a feature, in that the cursor is available for use with auxiliaries and won't disappear. If you are considering buying the Videoterm or the Full-View 80, check this out.

A Look at the Boards as Individuals. The Supe'R'Term is an oversize peripheral card with an extra piggyback board. Installation requires the removal of one chip on the Apple's motherboard and insertion of the piggyback board in its place. This board connects to the main card via a small connector, making it possible to remove the Supe'R'Term card from the computer without having to remove the piggyback board.

After inserting the card and the piggyback board, the monitor cable can be plugged into the phono jack video connector on the Supe'R'Term. The board provides two adjusters for video level and balance. The balance control is used to compensate for the bandwidth (frequency response) of the monitor used. It is especially helpful in achieving a pleasing display on medium resolution monitors or on modified television sets. The character size and screen area used by this board are similar to those of the Apple's normal forty-column display, so it is

very easy to get used to, even when switching back and forth frequently. A few characters are somewhat difficult to discern—capital W and M—but lower case is very clear with full descenders. Overall, the display is quite pleasing to the eye.

A single control character selects a terminal escape mode, by which the cursor can be redefined, the scrolling window can be changed, or another font can be selected.

Language System operation is fully compatible with a small routine supplied to replace the keypress function. Most programs will work with little modification. Lines printed in inverse look different because punctuation marks and the spaces between words are not displayed in inverse video. The documentation is very good and includes information on creating character sets and storing them in RAM. Supe'R'Term, from M & R Enterprises. ROM version 2.2. \$375.

Videx. The Videoterm is a compact board with a five-pin molex strip for video and light pen connections. A spare socket is included for inserting an optional alternate character set ROM. A switchplate assembly mounts on the back of the computer to allow switching between the Apple forty-column video and the Videoterm.

The character size of the Videoterm can be changed easily from the keyboard. Descenders on the character set that comes with the board are not well formed.

The Videoterm adds very few new commands; in fact, many normal functions do not work. This is the only board that lacks a soft shift feature to allow automatic return to lower case after a single capital. It also lacks capacity for a hardware shift key modification. When using different cursor control, you'll see a lot of extra flashes on the screen. However, the Videoterm comes with an excellent owner's manual that includes a schematic of the board and source listings for the firmware. Videoterm, from Videx. ROM version 2.0. \$345; extra character set PROM, \$39; switchplate, \$19.

The Computer Stop. DoubleVision is the only board that does not have its operating software in PROM, which means you must load the software from disk before the card will

work. This is a major drawback unless you want to make customized changes. For users without Autostart ROM, this is especially difficult, because no information is given on how to recover from accidental resets. It also makes the board less compatible with other peripherals and with programs written for other video boards. Operation with Pascal also requires special optional software, and the DoubleVision board cannot be used at all with the Z80 softcard at present.

DoubleVision uses the escape key for upper/lower case functions, as do several word processors. Hardware shift key operation is accomplished with direct connection to the DoubleVision board.

Since this board is the only one that recognizes normally the Applesoft home command, it rates highest in compatibility with existing programs.

The documentation provided with the DoubleVision leaves much to be desired. However, source code listing for the software is provided. DoubleVision, from The Computer Stop. \$295. Pascal software, \$25.

Bit 3 Computer Corporation. The Full-View 80 is rather an oversize board. Two cables exit from the rear of the card. One of these cables plugs into the video out connector of the Apple. The other cable has a female jack to which your monitor cable can be connected. This allows the Full-View 80 card to select which video is sent to the monitor under keyboard or program control.

Four dip switches on the board allow you to select either a five-by-seven or seven-by-nine character set. The standard sets do not have descenders, but an optional seven-by-nine set does. The Full-View 80 uses a flashing cursor to denote the shift lock mode and a steady cursor for the lower case mode; some video flashes will be observed when using cursor addressing. Modified shift key use is smooth. A special mode is available to print control characters. Three new characters can be generated that are handy in PASCAL. The board is compatible with light pens.

The Full-View 80 features the addition of three keyboard

macros that type the words CATALOG, LOAD, and RUN with just two keystrokes. A 60 Hz clock signal can be selected to generate nonmaskable interrupts. Preliminary documentation on the Full-View 80 proved adequate. Full-View 80, from Bit 3 Computer Corp. ROM version 1.0. \$395. Optional character set with adapter, \$62.

Advanced Logic Systems. State of the art design packs the most features into this latest entry in the eighty-column board field. A small cable runs between the Apple's video connector and a similar jack on the Smarterm. The second jack on the board is the video out to the monitor. A word of caution: the large metal parts surrounding the jacks are grounded and might easily touch the circuit side of a card in the next slot. The Smarterm includes video level control.

The board uses a five-by-seven character size with no descenders; a reduced screen area makes switching between forty-column and eighty-column modes easy on the eyes. A wide bandwidth monitor is recommended because of the character's compressed size.

Special features on the Smarterm include a complete graphics mode, four-way tabbing, and a flush output command that suspends text printing and allows the program to continue. The Smarterm uses a Control-A for soft shift. The Apple's shifted characters can be generated while in the board's extremely smooth modified shift key operation. Eight new characters can be typed directly from the keyboard.

Because the Smarterm commands use many of the control characters, these would be normally unavailable for use by a program or other peripheral board. However a verbatim mode allows any character to be passed on to the Apple instead of being interpreted as a Smarterm command. This is valuable when using the board with programs such as word processors, which use many control characters as commands.

Smarterm works well with existing programs, except in regard to the home command; Pascal operation does not require any patches. Documentation is above average.

Smarterm, from Advanced Logic Systems. \$360.

Summing Up: Which Board for You? Unfortunately, there is no clear winner. Your choice will depend on your needs and propensities.

The Smarterm has a lot of features and is certainly worth considering. Its only major drawback is a character set without descenders, and Advanced Logic Systems avers that a better set may be offered in the future. The Full-View 80 deserves attention for its interrupt and user-definable character set capabilities. Credit goes to the Supe'R'Term for providing the best display on the typical monitor that an Apple user might have. The Videoterm and DoubleVision boards, early contenders in this market, may find the competition of the newer boards tough to beat. However, they are still popular, particularly the DoubleVision, which carries a considerably lower price tag.

Not to be overlooked in any hardware decision is the other

name of the game: software. If you're going to use the computer for word processing, for instance, it's important to know which boards will work with the program you've selected (or, if you prefer, which programs will work with the board you've selected). Unfortunately, many complex programs such as word processors require extensive customization by the software manufacturer to function with the various boards. This can cause a delay in the popularity of a newcomer until the software market has a chance to catch up.

With Pascal and CP/M, this problem isn't as severe since both have system configuration blocks easily modified by the user. These blocks contain information about the type of display being used and can be changed to reflect the requirements of most boards. How you plan to use your eighty-column video board will probably determine which brand you select in the end. For the Apple hobbyist, the extended features of each board may be most important. For a secretary using the Apple for word processing, all the extras may be meaningless—the only considerations being character quality and software compatibility.

Before you shop for an eighty-column video board, determine your answers to these questions:

How much are you willing to pay for a board, including any necessary hardware or software that may be optional?

What do you want to do with the board?

Which programs must it be compatible with?

What type of monitor do you have and are you willing to buy a new one?

What other peripherals are presently, or likely to be, in your computer?

Ask your retailer to set up an Apple in your exact configuration and demonstrate the use of the video boards and software. This might eliminate after-purchase discovery of one of those obscure bugs that seem to creep in when various pieces of hardware and software are combined. This precaution, along with the answers to the shopping questions, should lead you to the best decision. ■

A Ruler To Measure Your Byte

Contributed by John R. Tkach, MS, MD

When dimensioning string variables and writing text, it's helpful to know how many bytes you're using, but counting letters and spaces by hand is time-consuming.

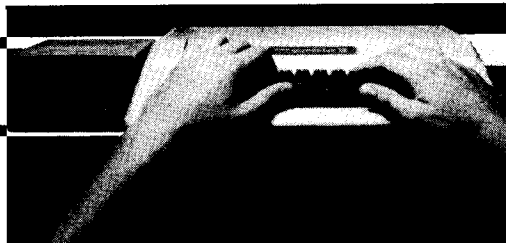
To avoid this, consider making yourself a byte ruler. Hold a piece of stiff white paper against a line of typed text and mark off every five units of typed or printed text, counting spaces, numbering the mark with the number of units to that point.

If you use several typewriters or printers that vary in type size, you'll need a separate ruler for each variation. Then mark the full length of one line as "full text line"; using an Apple printout with its forty-space text line, that would appear at measure line forty on your byte ruler.

It would be nice to have programming paper available for Basic, such as that used for Fortran. Such paper is marked with lines of numbered boxes. Until that's available, the byte ruler does the trick. ■

MARKETALK

Reviews



The Prisoner. By David Mullich. Especially if you enjoyed the old television series, *The Prisoner* is apt to bring you the most fun you've had since going to see *The Empire Strikes Back* for the second time.

The Prisoner is an intellectually challenging player versus machine game inspired by Patrick McGoochan's television series of the same name. In the game's scenario, the player assumes the role of an intelligence agent who has resigned his job for reasons known only to himself. Consequently, the former agent is abducted to the Island, a physical and psychological prison for those wanted for information. Your captors wish to know why you resigned your job and will exert considerable psychological pressure on you to get that one piece of information — represented in the game by a three-digit number — from you. The player's object is to gather the information needed to escape from the Island. The computer's job is to harass the player into revealing his three-digit resignation code.

The Prisoner presents a wide variety of puzzles and challenges that are as finely crafted as those in an Agatha Christie mystery story. The game is actually an elaborate game system comprised of twenty-five different games taking place on the Island.

As in other adventure games, the rules must be learned as the game is played. What puts this game head and shoulders above other adventures is that while the player is seeking the information needed to escape from the Island, the computer is actively seeking the information that will make the player lose the game. The dual challenges of learning about the Island while avoiding the subtle and not-so-subtle traps laid by the computer make the game both interesting and exciting.

One of the purposes of *The Prisoner* is to simulate the loss of individual identity in a society that demands excessive obedience to authority. The game very effectively uses the Apple's lo-res graphics, hi-res graphics, and text capabilities to represent the surreal atmosphere of the Island.

The player is initially presented with an almost overwhelming amount of bewildering detail. Why is there a file cabinet at the circus? Why does the general store sell gold paint? What is the purpose of the psychological tests at the hospital? What do the Caretaker's questions mean?

While the player tries to sort out these details, the computer mounts a psychological assault, including subliminal messages, to frustrate the player and to conceal information about the Island. Incredibly, most of the bizarre features have a logical purpose that players eventually discover if they play the game intelligently.

The Prisoner is a thinking person's adventure. As the documentation says, "The challenge is to your mind." The ultimate solution to escaping from the Island is both elegant and outrageously obvious. It is also delightfully Zenlike. The search for the solution provides many hours of intellectual stimulation. It also provides many hours of pure fun. EduWare is to be commended for the excellent quality of *The Prisoner*; I recommend that you purchase this game. ¶

The Prisoner, by David Mullich. EduWare Services, Canoga Park, CA. 48K with Applesoft, disk drive. \$29.95.

Apple Music Theory. *Apple Music Theory* allegedly assumes a minimal familiarity with musical terms and concepts, but in fact the program is so nicely designed and the guidance is so gentle that you could probably step into it without knowing a minor sixth from a flugelhorn. Along the way, you would be introduced to the most important features of musical notation, to the names and sounds of different intervals, to the names of all

the key signatures, to scales (major, minor, and modal), to different kinds of chords, and much more.

You could, in fact, emerge at the other end with most of what you would need to know to begin a college freshman course in music theory.

The program is divided into seventeen modules on two menus, the first group simple and the second more complex. Included on the first menu are programs that teach the student the names of different notes and their values (half-note versus whole note, for example). There are also exercises in distinguishing key signatures and in recognizing important musical terms. And there are a couple of programs that teach intervals. The first of these draws a pair of notes on the screen in colorful hi-res graphics and asks the learner to name the interval between them. The other interval program actually plays the notes on the Apple speaker.

One of the most praiseworthy features in all of this is that the student always controls the level of complexity of the exercises. In the interval modules, for example, you can allow the computer to quiz you on everything from a minor second to an octave, or you can limit it to any group of intervals within that range. This is handy for a number of reasons. Certain intervals sound more alike than certain others, so, for example, if you have trouble distinguishing a major sixth from a minor third, simply restrict the Apple to those two intervals until the difference is clear and then move on.

In other words, you as the learner are in control of your own pace and your own agenda.

The second menu provides some exercises in musical dic-

tation. One module displays a group of five notes on the screen and then plays them on the speaker. One of the five is incorrectly notated and the student is asked to identify it. In another exercise the screen shows you a rhythmic pattern and you play it back by hitting a key on the computer. Still other modules let you discriminate between five kinds of seventh chords, three kinds of triads, eight different scales, and so on with plenty of fun and learning. ()

Apple Music Theory, Apple Computer Inc., Cupertino, CA. Applesoft, 32K, DOS 3.3. \$50.

TellStar. By Evan M. Scharf. With "an Apple II computer, a telescope, and lots of curiosity," Evan Scharf has created one of the most compelling educational programs to date. Intended for everyone interested in stars, planets, and galaxies—the *real thing*—*TellStar* simulates the sky to order. You tell it the date and time of the heavenly configuration you wish to see, along with the viewing location, and *TellStar* will return a hires representation of all the objects you would be able to see; views from eight directions or from overhead may be chosen.

A constellation mode draws connecting lines between the stars that make up each constellation currently on the screen.

Input the name of an object you wish to locate, and *TellStar* will display the appropriate part of the sky with that object flashing. The majority of us, who soon run out of familiar objects to be located, can use the paddles to zero in on any object on the screen; instantly, *TellStar* will reveal name, magnitude, phase, right ascension, heading, declination, elevation, object rising time and heading when rising, and object setting time and heading when setting, all calculated to the second.

With the disk comes a carefully prepared manual, a learning tool in itself. Appendices give the latitude and longitude of cities worldwide; Messier descriptions; Level 1 star table; and, in the advanced version, Level 2 star tables for the Northern and Southern hemispheres.

A Calculation Section allows five kinds of calculations needed by astronomers, professional or amateur: for equatorial to horizontal, horizontal to equatorial, and ecliptic to

equatorial coordinates; for precession since 1950; and for solar system objects.

The only disappointment in this remarkable program is a trivial one: years for observation are limited to the range from 1975 to 1999. Unless you're extremely young, you'll not be able to see the heavens at the time of your own birth. MCT

TellStar by Evan M. Scharf, Information Unlimited Software, Berkeley, CA. ROM Applesoft, 48K, disk. \$39.95; advanced version using multiple star tables, \$79.95.

Tax Preparer. By James E. Howard. It would be wonderful to report here that the magic of Dr. James Howard's programming and the Apple computer could actually make a joy out of tax preparation. Alas, it cannot be said.

Furthermore, it cannot even be said that every Tom, Dick, and Harry should hie himself off to his local Apple dealer to avail himself of this program. Because if you're a numbskull about taxes, this program will only make it easier for you to show your ignorance.

Who *should* rush to their dealer is every accountant and accounting student with access to an Apple and all the tax do-it-yourselfers who are satisfied that they know all they need to know about their tax situation or who know how to read the government pamphlets that will give them that knowledge.

Tax Preparer is a remarkably complete package containing the eight IRS forms and ten schedules most commonly needed by those of us who lack the wealth to join in the bidding for Twentieth Century-Fox.

The program diskette and manual thoroughly walk you through a sample before assuming that you're ready to begin on your own taxes. A copy program on the program diskette enables you to copy onto a data diskette only those forms and schedules that are actually needed for your return. It is the data diskette that you'll be using for all the work—unless you have two disk drives, in which case all that copying is unnecessary.

Tax Preparer is no smarter than your present tax accountant in that it can't give you a return without data. Just as you have to provide your accountant with all relevant data for him to calculate your taxes accurately, so you must tell *Tax Preparer* the same information.

And that's the rub for those who are determined ignoramuses in the field of taxes. *Tax Preparer* will not ask you any questions about the more recent and arcane tax dodges. If you don't know about them, your tax will be prepared without benefit of those deductions. But if you are reasonably knowledgeable and honest in your tax preparation, then *Tax Preparer* will do everything your accountant does.

You provide the facts and *Tax Preparer* will do the arithmetic and prepare all the forms.

Tax Preparer picks up where Apple Computer's *Tax Planner* left off. Apple's program was quite capable of determining the most advantageous method of calculating your taxes and of providing advice about many financial dealings, in terms of timing, that are important for tax purposes. But the *Tax Planner* stopped there. *Tax Preparer* can also give you alternate tax scenarios, although not with the ease of *Tax Planner*. But it will churn out reports that the IRS will accept. The two programs complement each other.

One liability of *Tax Preparer* is that it will not also compute your state tax return, although that capability is promised for the future. This does not seriously detract from the value of the program in that many of the schedules and itemizations called for in state returns duplicate the IRS requirements, which means that a change of headers may be all that's necessary in some cases for some of the supporting documentation. Likewise in the future are updates at nominal cost reflecting changes in IRS regulations.

The other liability of the program is that it doesn't lighten the tax load, it only tells you faster what the load is—unless, of course, you can figure out a way to deduct the cost of the program and the Apple from your taxes. ART

Tax Preparer by James E. Howard, Howard Software Services, Los Angeles, CA. 48K, disk, Applesoft ROM. \$99. ■

VENTURES WITH VISICALC

BY FRANK MALONE

When you've purchased your Apple and begin searching for useful software, one of the first products you're likely to encounter is VisiCalc. Or perhaps you're one of many businesspeople who bought a VisiCalc with your Apple; a version of the program comes with the Apple III.

VisiCalc? The term might bring to mind Visigoths of old staging a barbarian invasion. But when you read the VisiCalc manual, that image quickly dissipates; as your knowledge grows, you become increasingly excited about the amazing possibilities of using these electronic worksheets.

A Rapid Acceptance. Apparently, most VisiCalc users experience such euphoric feelings. Computerland/Cedar Rapids has such a large VisiCalc following that we have formed a VisiCalc users group to exchange ideas and original applications programs.

Please note that the term program throughout these articles will be used to refer to user application configurations rather than to professional coded software.

My first project on VisiCalc was a simple program using my checking accounts as source documents. It was a pet project for me.

Taking Account of Time. Some years ago, my accountant had admonished me, as he handed me a thick book of blank ledger sheets: "A few hours a month and you'll be ready for Uncle Sam in April."

Those few hours turned out to be an ongoing, time-consuming pain in the neck. I had to hand-enter every item of income and expenditure, total the columns, and carry the totals forward every month—in pencil so the inevitable mistakes could be reconciled at the end of the year.

Eventually, I suggested to my accountant that we set up the whole procedure on a computer. At the time, he would have no part of it. "I don't trust anything that isn't on paper."

Times have changed, and so have my accountant and I. I have an Apple and use VisiCalc to prepare and print tax information as well as an increasing amount of other data. My accountant uses the services of a mainframe computer and gets tons of paper.

Power to the People. Maybe he's

happy with that; but I'm convinced that he and most accountants and bookkeepers simply haven't recognized the advantages they'd realize by using personal computers with programs like VisiCalc to increase their number-crunching power. The benefits would accrue to you and me as clients as well.

Thus, it's in everyone's interest to spread the word about Apple and VisiCalc for accounting, bookkeeping, and multifarious other tasks at home and at work, by consumers and professionals. VisiCalc can free all of us from having to crank out endless rows and columns of calculations; what we'll have instead is a gift of time saved to use as we please.

The many applications of VisiCalc, along with detailed instruction on their implementation, will be the subject of this column in future issues. For now, as an introduction, here is a sampling of some uses implemented by members of the Cedar Rapids VisiCalc users group.

Computerland/Cedar Rapids sales manager Bob Boettger has developed a commission calculator on VisiCalc. He works from invoices and must calculate differing commission percentages; with VisiCalc, he has been able to cut hours off his processing time by injecting speculative numbers.

Get Rich Quicker. Another VisiCalc user does moving stock averages, deriving buy/sell recommendations. Recently, he made several thousand dollars on two stocks primarily because of the alacrity with which he could apply stock change formulas through VisiCalc.

Several local home VisiCalc users have reported setting up simple budgets

showing actual versus projected income and expense. Most have discovered that they, like many others, are spending more than they expected. VisiCalc, because of its speed and accessibility, strips away excuses for overspending; no longer is it impossible to find out where the money went.

Insurance and real estate agents have shown much interest in VisiCalc, since both types of agents deal with many variables directly affecting their incomes. One insurance representative sought a method of comparing costs for his clients to help them decide which of several term insurance companies offered the best rate structure for their needs. Using VisiCalc, it was simple to set up a sheet listing the yearly rates of each contending company over a period of time, thus allowing prospects to figure their total costs according to entry age and projected longevity, a pleasingly straightforward approach for prospects. VisiCalc enables prospects to get immediate, clear answers to speculative questions without getting lost in a maze of one-sided actuarial tables. The prospects gain confidence and the agent gains credibility—and, most likely, customers.

Homing In On Business. These illustrate only a few of the potential uses of VisiCalc. Although the emphasis of this column will be on business uses, individual home applications won't be overlooked, nor will the translation of business applications to useful home projects be neglected.

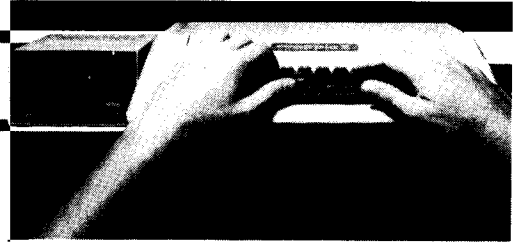
Readers contributions to this column are welcome; we can all profit from these exchanges. ■

Frank Malone serves as education resources manager at the Computerland store in Cedar Rapids, Iowa.

If you have a VisiCalc application you'd like to share with Softalk's readers, write to Frank Malone in care of Softalk, 10432 Burbank Boulevard, North Hollywood, CA 91601.

MARKETALK

N E W S



□ *Scientific Plotter* is a graph-making program from **Interactive Microware** (State College, PA). Input data from disk or keyboard, or calculate it by subroutine. Twenty different plotting symbols, error bars to indicate error range. You control grid size, position and length of axes, and interval between points along axes. A seventy-six-character alphabet of letter and scientific symbols is provided for labels. Preferred plotting formats may be saved to disk. Includes five instructional demonstrations to help the novice graph plotter. 48K, Applesoft ROM, \$25.

□ **Muse** (Baltimore, MD) offers an enhanced version of *Three Mile Island*, the game that simulates operation of a nuclear power plant. Rewritten in machine language with auto/demo and fast/normal modes added, full-color displays change rapidly and overall game is faster. 48K. \$39.95.

□ **Program Protection** (Mesa, AZ) was

listed in January's Marketalk as located in Mission Viejo, CA. "The real brains and heart of Program Protection are in Mesa, Arizona," company president Kenneth Cohn reported from his home—which is indeed in Mission Viejo.

□ *The Attendance Program*, by **Charles Mann and Associates** (Yucca Valley, CA), enables schools to keep detailed records on pupil attendance, absence, and tardiness and to prepare reports on average daily attendance. Latter data can be used in petitions for funding; built-in audit trail justifies figures. System combined with Mann's *Grading Program* allows inclusion of attendance records with report cards. Also interfaces with Mann's scheduling, counselling, and grade reporting programs. \$249.95.

□ Under its new EPYX line, **Automated Simulations** (Mountain View, CA) presents *Star Warrior*, an epic adventure with the theme of revenge and justice in space. You are Fury, an avenging war-

rior for hire employed by the citizens of Fornax to overthrow their oppressor, the Stellar Union. Fury must single-handedly confront the Union's militia and arsenal, running, jumping, or flying over forbidding terrain at your command. Player must also manipulate Fury's wardrobe of armor. Two schemes of attack are to set up decoys to draw the forces away from the main military installations, the target of Fury's destructive powers; and to hunt down the Union leader and his staff, who are wily and elusive, often vanishing without a trace. Game has nineteen command options, extensive graphics display, sound effects, and five skill levels. 48K. \$39.95.

□ For users with the IEEE-488 1978 bus, an important and economical innovation comes from **SSM Microcomputer Products** (San Jose, CA). The *A488* card turns your Apple into a bus controller, making accessible more than a thousand digitally controlled products compatible with the bus. According to SSM, the *A488* is small enough for the Apple thanks to the Motorola 68488 controller circuit that decreases software overhead and the amount of IC packages needed. Board has two kilobytes of firmware in EPROM, which, if needed, can be replaced by a RAM. Bus and system are controlled with short series of string commands; as many as fifteen pieces of equipment can be connected to board over a transmission distance up to sixty-six feet. Firmware is linked to Apple's string routines for fast programming and floating point processing. Bus communication is quickened by elimination of software timing loops. The *A488* comes with an IEEE 488 bus cable. Applesoft, 48K. \$475.

□ *Educational Electronics*, a newsletter reporting on innovations and progress in technological uses in education, begins this month. Monthly publication plans to cover such subjects as handicapped aids, instructional computer hardware and software, audio-visual equipment, technology in the library, and information retrieval systems. Year's subscription is \$50 prior to June 1; \$60 thereafter. For further information write **Educational Electronics**, One Lincoln Plaza, New York, NY 10023.

□ The first space wargame from **Strategic Simulations** (Mountain View, CA) is now available. *The Warp Factor* challenges one or two players to command starships in locked stellar combat. Choose among twelve starship designs representing five galactic empires. Tech-

nical as well as combat skills are demanded: ability to control the warp engines, disruptor bolts, screens, shields, and phasers determine whether you are victorious in the galaxies. Levels from minor skirmish to massive campaign can be selected. Package includes manual, three starship data cards, and game selection card. 48K, Applesoft. \$39.95.

□ *The 7551 CSI Auto-Modem* from Computer Station (Granite City, IL) enhances use of Hayes Micromodem. Auto-dialer allows single key dialing of bulletin boards; auto-answer receives calls from other modems while user is away from keyboard; auto-caller, using the *Phonelist* program provided with Apple's DOS 3.3, dials any number you select from *Phonelist* directory and reports connection. When you're away from your Apple, auto-message takes messages and sends them to disk for later retrieval. Also included is a self-test debugging program. DOS 3.3, Applesoft ROM, 48K. \$39.95.

□ With *Graphtrix* from Data Transforms (Denver, CO), user can add graphics, chapter headings, and footnotes to text generated on Apple Computer Inc.'s *Apple Writer*. On Anadex 9500 and 9501, IDS 460 and 560, and Epson MX-80 matrix printers, graphics can be printed in three magnifications; text-embedded commands print graphics at nearest appropriate point in text. Footnotes may be added at end of chapter or at bottom of each page. Program was originally developed by Data Transforms for a solar feasibility analysis project. DOS 3.3, 48K, Applesoft. \$55.

□ *Street Electronics* (Anaheim, CA) announces the *Echo II*, a true speech synthesizer for the Apple. Linear Predictive Coding that mathematically reproduces the human voice minimizes memory storage space. With this capability and the Texas Instrument TMS 5200 speech processor modified to function with an eight-bit processor, the *Echo II* board can produce forty-three distinct word sounds, or phonemes, enhanced by eight lengths and volume levels and sixteen pitch levels that can alter the tone of Apple's voice. Speech editor makes creation of any word or phrase possible by arranging sounds based on line numbers that can be modified as user desires. Slot-independent board comes with sample 175-word vocabulary. 32K, Applesoft, disk drive. \$225.

□ The *Sellum I* printer from Intersell (Mountain View, CA) produces letter-quality copy as fast as seven hundred words per minute. Interface is equipped with 16K RAM, 4K ROM capacity, and a Z80 microprocessor. The *Sellum I* is capable of logic seeking and bidirectional printing and has a switch or software selectable baud rate. Simultaneous printing and data input is possible through a 650-character buffer; there's an optional 16K buffer for printer spooling. \$3,495.

□ *Teaching Computer Programming*

(Minot, ND), a monthly newsletter published by high school teacher Craig Nansen, is written especially for the junior high and high school teacher introducing programming languages to their students. Subjects covered range from advice on Pascal to prime/factoring programs. Nansen's classes have twelve Apples supplied with Pascal cards; machine language is taught in advanced classes. Write him at 1112 Glacial Drive, Minot, ND 58701, to obtain the newsletter—\$8 for twelve issues.

□ *PEAR*, the portfolio evaluation and reporting system, from Pear Systems (Stamford, CT) is designed to help investment counsellors and stockbrokers maintain and update the constantly changing records and information typical of those industries. Hardcopy reports supply clients with records of security holdings, portfolio appraisals, and tax reports. Updating functions record current securities prices, gain or loss probabilities upon selling of stock, adjustment of records when a stock splits. Securities information applying to multiple portfolios need only be entered once. Compatible with any 132-column printer, *Dow Jones Portfolio Evaluator*, Hayes *Micromodem*, and Apple's *CommCard* with coupler. Apple II, 48K. \$500.

□ A learning package, the *Individual Study Center*, is available from TYC Software (Geneseo, NY). User can select from fifty subject data files for use with activities files. Designed to make difficult subjects more palatable activities, files are designed to involve and challenge students from grade one to adult with games such as *Beat The Clock* or *House On Fire*. Graphics enhance all activities files. Demonstration subject data file with manual helps user create subject files using maintenance program. 48K. \$54.95.

□ *Superstar* from Clear Light (Fort Lauderdale, FL) enables word slides, graphs, and graphic images generated with Clear Light's *Stargraphics* program to be transmitted via telephone to a franchised photo lab for forty-eight hour slide processing. With *AMPL/1* (Advanced Multi-Image Programming Language), user has multitasking and full-page video editor for building slide shows using more than a hundred projectors. Help key provides beginners with instructions. Hardware includes an Apple II computer, two *Superstar* disk drives, nine-inch black-and-white Sanyo monitor, and cables, which may be coupled with modem, any graphics tablet or music synthesizer, Clear Light's *Star-3* slide dissolve units and *Star* video controller for hi-res graphics (available in June). System can use any color graphics, game, accounting, computer-aided-instruction, or word-processing program for the Apple. Computer with imaging software for slide dissolves is \$4,495; *Star Universal* interface that controls as many as five dissolve units is \$1,495. ■

Apple Women

from page 10

The PDP-11/34 provided Maybruck with a working knowledge of computers during a stint at Tektronics, where she was involved with computer-based customer service. Maybruck began work in a corporate law firm immediately after finishing school; she interrupted her career only once: she spent a year in Israel helping set up respiratory care programs.

Since she came to Apple and learned to use its product, Maybruck has been toting her office Apple daily between home and work. She uses it "all the time." Recently, her husband Alan, an inservice instructor for respiratory medicine and director of a respiratory rehabilitation facility, has expanded his uses of the Apple to include financial planning on the *Tax Planner* and work with medical programs. So the Maybrucks are now installing a new Apple to remain at home. Since Lynda is not likely to sit by and watch Alan monopolize the home Apple, it's likely she will still be toting the office Apple to and fro.

At Sea with an Apple. "We began with games; then came text-editing and *VisiCalc*. Now I'm interested in working up navigational programs."

Navigational programs?

"I'm a sailor. I'm not technical—I don't program—but I want to learn enough to use the Apple for sailing. For instance, I'm working on a weather facts program.

"Eventually, I'd like to use the Apple onboard the boat while racing."

Maybruck believes that everyone will have a computer eventually. She believes that many people's reluctance to use computers is based on a fear that they'll do something wrong and either ruin the computer or, in their lack of knowledge, be unable to fix it. As a solution to this, she advises everyone to take a look at kids.

"Kids are not afraid of anything. They march up to the new computer and give it a mean test, and it passes. What I'd like to say to new Apple owners is:

"Don't be afraid—you can't break your Apple. Jump in, but

pay attention. If you do something wrong, try something else. Most of all: the Apple is not fragile."

Which is not to say you should drop it on the floor or bang it against the wall for fun.

Key to Respect. As to prejudice, Maybruck doesn't notice it. "It depends on how a woman feels about herself, the image she carries in a male world. If your confidence is there and you do your work well, you'll be respected.

"If I come across prejudice, I don't let it get my guff. A woman can get across to an obstinate man as easily as another man can."

But when the pace is like Apple's—"about five hundred miles an hour"—men notice more when a woman gets upset. "I don't let myself get upset or show frustration." Maybruck isn't including honest anger in her abstention. "Fury—that *has* to happen now and then."

Fury is the last emotion you'd expect to encounter in the quiet, efficient atmosphere of Maybruck's office. Closer scrutiny reveals a woman quite capable of fury—and of expressing it with an authority, strength, and control that command respect; and, deservedly, Lynda Maybruck gets it.



Phyllis Cole

Less than a month ago, at an international after-Christmas soiree Eileen Forest arranged for Apple's staff, Mike Markkula cornered Phyllis Cole, the woman who put together Apple's publications organization. Apparently, Cole is apt to slip away when praises are to be sung, and Markkula was making sure she'd hear what he had to say. All he wanted to tell her was that he was glad she was at Apple; that she was doing a super job.

Yet Cole is not a new employee nor one whose contribution is being recognized for the first time. She's been at Apple three years—since the stone age, relatively. But Apple, in the person of Markkula, wasn't about to let Cole's superior effort go without remark just because it's an everyday event.

The Chance To Speak One's Mind. Apple's feelings about Cole are not without reciprocation. Cole considers her experience at Apple merely "the most exciting, most interesting, most rewarding job ever."

When Phyllis Cole became Apple's manager of publications, there were four people in the department. The staff of Apple was "a hodgepodge of people, all of whom got involved in everything. For instance, I had very strong opinions about keyboards; so I was able to put in a word about their design."

Now, the department has more than thirty people distributed among three divisions.

The Project. Phyllis Cole brought to Apple a new concept for disseminating computer knowledge. Apple's willingness to buy the concept was the original reason Cole came to Apple. The idea is for interactive manuals—manuals that aren't books, but are tutorials conducted by your computer about itself or about some program on it. The project is the development of this concept.

With interactive manuals, lengthy books of documentation would be unnecessary. You would boot your new package immediately, and it would teach you, on your Apple, how to use it. And, through preliminary computer-asked questions, it would determine your interest or application and teach you only what you needed to know.

It would tell you things to do, monitor your execution of them, and report on whether you did what it said.

This is Phyllis Cole's special project, one she has been nurturing for years and that Apple has been encouraging. Anyone who has had to learn VisiCalc from the manual—and that's an example of good, clear instructions—will recognize the value of the project.

Recently, Cole relinquished her position as manager of corporate publications to devote her time to interactive manuals.

Like Sheri Talbott, cofounder of Mountain Hardware, Cole recognizes that moving into management usually precludes getting your hands dirty—actually working on projects. And, like Talbott, Cole's opting for dirty hands, at least for the time being.



Carol Hausmann

At Apple, programmers are called engineers, and with good reason. As Apple engineer Carol Hausmann explains it, "Programming refers to only one stage of software creation—coding. Software engineers are involved in many stages."

The initial idea for a package comes from—whoever thinks of it. The idea leads to the project proposal, the first stage of the package's life, after which the package is assigned a project team, consisting of an engineer (in the programming sense), and representatives from publicity, publications, new product review and testing, and marketing.

From the Outside In. The second and third stages take the

large bulk of time. First come the external specifications, involving detailed planning of what the program will look like. This stage often results in a document actually showing the screens that the program will present and giving a flow chart. Acceptance of this leads to internal design, in which program methodology, file and data structure, and language are determined. Because the resulting plan often changes the external design, these two stages do-si-do until the project team is entirely satisfied.

Only then does coding—actually writing the program in the chosen language—begin. At this point, the engineer knows where she is going, what the result will look like.

Early in the life of the project, the manual is begun; meanwhile, the coded program goes to new product review and testing and, in the process, changes its name: it's now a *prototype*.

"There are always bugs," Carol Hausmann says. "The very best programmers don't create bugfree code." So the next stage is the tedious job of debugging.

Meanwhile, the product manager, the team marketing member, has determined the package's name, price, and market, all of which have been incorporated into the finished product.

Roots of an Engineer. Hausmann, always outstanding in math, knew she would go into some math-related field. When she had to pick a field of study, she initially passed on computer science because she assumed it was too difficult.

"I'd no longer take that approach to *anything*," she says.

At Berkeley, she took math, logic, and engineering, and liked electrical engineering best. Meanwhile a part-time job in the computer industry brought her into contact with a software engineer who became her mentor, providing her with hands-on computer experience and encouraging her.

She interviewed at enough big companies to know she preferred a small one, and many small ones were willing to hire her—but Apple won because she preferred microsystems and "a lot of things were happening here." ■

BY MARGOT COMSTOCK TOMMERVIK

"Apple Means Business," full-size and cleanly framed, vies with a page from the *Wall Street Journal*: "To the 150,000 Apple Owners Who Brought Us Here . . . Thank You" for domination of the walls of a sunny corner office. A slender woman with bouncy dark hair rises gracefully from behind a large desk to greet her visitor. She looks too young and delicate to be high-powered executive—until you notice her eyes: direct, flashingly alert, intelligent.

Five years ago Jean Richardson was a housewife, just beginning to dabble in courses at the local college as her children grew older. When her youngest son became acclimated to school, she accepted a secretarial job at the college; almost immediately her job was expanded to include planning and production of seminars.

Unbounded Energy. Richardson liked meeting people, liked being back at work, but found the academic atmosphere—rapt as it is in its own life and pace—lacking stimulation.

"I'm too hyper," she says, describing that quality of energy in herself that, challenged and focussed, creates a dynamo.

She sensed that young industry was the place to look for the stimulation she required. The established companies—the Intels, for example—were too big; the chances of getting stuck in a corner too great.

Then Richardson saw a newspaper article about Apple. At the same time, Logic Machine Systems and Durango caught her attention. She interviewed at Durango, then staffed by only four or five people, and at Apple, which had a skeleton staff of engineers and manufacturing people. Apple won her interest hands down.

The only position open was that of secretary to Rod Holt. "I knew I'd have to come in at that level," Richardson says. She expressed her interest in marketing, and evaluated Apple as a company open to change and to recognizing talent.

The first job wasn't uninteresting but "there wasn't enough to do." Richardson got involved in production for a while, occasionally poking an unmechanical nose into the lab. "I even got to do some soldering; it was fascinating, but not really my interest."

But she did begin to see how computers would change the way we live, how they would make people more intelligent, and found the prospect very exciting. Richardson also found the atmosphere at Apple ideal—"a young, fun atmosphere."

Nevertheless, her own job demanded too little of her, and she was bored; so she began to think of leaving and starting her own company.

A Department of One. Apple, however, wasn't about to let a good thing go. Richardson might still have been a secretary, but her talents had not gone unnoticed by Apple management. Rod Holt talked to Mike Markkula, then vice-president of marketing and chairman of the board, and Mike offered Jean the job of marketing services manager.

In fact, her new position made her manager of a department of one—herself. She worked closely with Markkula and credits his support, character, and attitudes for much of her professional growth and love of Apple.

"Mike gave me very little direction; he forced me to choose my own directions, make my own decisions.

"Many women get into the role of checking with their husbands and carry that role into the office. Markkula wouldn't let me play that role."

The Courage To Be Free. Instead, when Richardson had an idea for some course of action, Markkula's typical reply was "Do it." To "what if I fail?" he'd say, "Then you try a different way." On the other hand, he made it clear that too many failures would lead to exit from the Apple crate.

A person of lesser courage, less confident of her ability to judge and act independently, might have folded under the stress of worry or the pressure of demands. But Apple Computer Inc. is singularly lacking in such persons.

Instead of folding, Richardson leapt at the challenge with

EXEC APPLE.

enthusiasm and pleasure. And, instead of too many failures, her decisions and courses of action have built a marketing services department of twenty people.

Marketing services is a unique department. It is police department and cheerleader, window dresser and keeper of the flame. Formally, the department is responsible for the corporate image as it pertains to all products and for the visual image, that is, all graphics and design projects excluding product design.

But What Does It Do? Apple retains an advertising and public relations agency, which produces ads, issues press releases, and does media coordination. But that agency must answer to Jean Richardson. She must approve all advertisements for Apple and check all product publicity for consistency with Apple's image.

On its own, marketing services produces sales literature, such as the Apple magazines, and promotional items, such as the colorful Apple-striped banners that grace many retail computer stores. It's responsible for the design of booths at computer shows and signs for Apple's buildings.

It even designs Apple's stationery and Christmas cards. Richardson and her department must keep aware of any product that uses the Apple logo in any way and see that such uses are confined to those that further Apple's image and carry proper acknowledgment of Apple's trademark rights. Their approval is needed on all Apple gift store items, such as the Apple logo necklaces, Apple T-shirts, ties, and belt buckles.

Kudos for Compatibility. Despite its six hundred plus employees in Cupertino alone, Apple is still a small enough company that each department is known by the rest. Richardson's marketing services department's twenty-person staff has



Jean Richardson

gained a reputation for being a compatible team, committed to the philosophy of keeping the world aware of the quality of everything to do with Apple.

It is this reputation, and the accomplishments it represents, of which Jean Richardson is most proud. In the process, Richardson found she enjoyed bringing in new people, seeing how people work together. Like her mentor, she believes in throwing new employees into their work, giving them the freedom to do things their own ways. And the employees she hires, like their mentor, leap at the challenge, revel in the freedom, and do not fail.

This freedom, this spirit of independence and of respect for individual ability along with the superior quality of the product Apple is all about have led to a camaraderie and an enthusiasm for Apple among its employees. Each of the new additions to Richardson's marketing services department has caught this spirit of enthusiasm; each recognizes—and exudes—the “quality of quality,” as Richardson puts it.

When Richardson first began this department, Apple was a world of men; the pace was and is intense—just the way she likes it—and there was no time to spend with women, other than that she left open for career talk; no time for any extra conversation. Now, the department is mostly female, and Richardson sees her staff as extremely competent and capable. “I can't imagine replacing a single person in this department, male or female.” Higher praise can no manager offer her employees.

Give It Your All and Then Some. Jean Richardson hopes that her success might serve as an inspiration to women who have difficulty breaking through. “You plot your course, you work like heck, you improve yourself—anything's possible, if

you're willing to put out a hundred and fifty percent. And you must love your job.”

To the young woman wishing to break into the computer industry, Richardson stresses education. “To be a success, begin by earning a degree—preferably a master's degree—in engineering, computer science, or business.”

Overall, Richardson feels an empathy with the housewife who is dissatisfied. “I know where they are—I can understand their feeling left out.” But she is hard-nosed about those who complain but take no action, “the women accepting their situation and doing nothing about it.”

To those who are willing to act, women planning on reentering the working world, Richardson offers different advice. “Women reentering need to be realistic. Many women, having successful husbands, having managed a household or charity or voluntary organization, want management positions immediately. Maybe they could handle them too; but they won't get them. You should be willing to start at the bottom and show your brains through your efforts.” Most important, “Judge the spot you find carefully; if the company, or your employer, isn't open to talent, change. Find a company that is.”

Cruising through the Sound Barrier. Apple Computer Inc. is clearly a diamond among such gems of companies. And Richardson appreciates it. In summing up her position at Apple, she declares, “I couldn't have found myself in a job more closely related to my interests.” She pauses, a slight frown disturbing her brow. Then the broad smile returns as she adds, “In fact, I can't think of anything bad about it!”

With that, Jean Richardson, thoroughly relaxed and enjoying herself at her supersonic pace, is off to another meeting, another project, another welcome challenge. ■



Lynn Busby

Women at Work with Apples

Compiled by Margot Comstock Tommervik and Craig Stinson; in-person interview with Lynn Busby by Stanley Dratler.

Busby and Busby.
The black-and-white
version is Ditherized.

Stanley Dratler photos



Be it known to all persons that Lynn Saunders Busby is the rightful, legitimate, and proud owner of Computer Station, Granite City, Illinois.

If you live around Granite City and you dig Apples, chances are that isn't news; Ms. Busby has occupied the position for over a year now. But Computer Station, besides being a place to buy computers, also produces, distributes and supports a variety of software and hardware products to a worldwide market, and a lot of people who deal with the company from a distance may not know that the lady on the other end of the line is, as she likes to call herself, "the main man."

So this is to be a coming out of sorts.

Equal To the Task. If she is reticent about owning her company, it cannot be from lack of confidence in her business skill or computer expertise. During the thirteen months of her tenure, Computer Station has done most remarkably, and even the purest "peekers and pokers" are comfortable with her as an equal.

It may be, perhaps, that she just never expected to be where she is now. "I was supposed to go off and get married and bake cookies," she says. "Kind of boring, but that's what I was supposed to do."

Apparently she did do some of that. In college she studied dance and psychology. She also learned a bit of math—"Boolean algebra, Venn diagrams, and all that good stuff"—not because she saw anything in particular to do with it, but because it was fun and gamelike.

A Rare Breed. Little did she realize that this is just the sort of mix and the sort of *attitude* that breed computer people.

After college she married, and went into the clothing business, and eventually discovered the computer, thinking it would simplify her life. Not so, of course, because while computing may have made the clothing business more manageable, it also did a dance on her brain, to the point where she found herself getting up at five in the morning to learn programming and staying up late reading technical magazines.

"I didn't understand a lot of it, of course, but I had never been so excited about learning anything. I couldn't learn enough fast enough," she says now, gazing off into the not-very-distant past.

Finding a Station in Life. Eventually, what with one thing leading to another, that marriage dissolved, and she swapped the clothing business for an interest in a place called Computer Station.

"I was just driving by one day and I saw this place, and I thought, 'Oh, no, there can't be a computer store in Granite City!'" But there was, and she found brains there to pick and encouragement for a burgeoning passion. Before long, she made an investment in the place, and not long after that, when the owner decided that his future lay elsewhere, she became the principal shareholder.

When she first became associated with Computer Station, the store sold computers and peripherals and a few home-grown software items. Now, in addition to the computers and peripherals, it sports an increasing integrated line of software products, with a general orientation toward graphics.

It's All in the Cards. "We hope to become known in the industry as the house of the graphic drivers," Lynn says. To this end, Computer Station has created new software for the Paper Tiger 440 and 460, as well as a graphics program that dumps

Apple Writer text to the Silentype printer in various type fonts. "It makes magic," she assures us. The firm's latest entry into the Apple market is the Dithertizer II, a frame grabber digitizer—also said to "make magic."

The current product-in-the-making, due this spring, is the Station Master, a parallel interface card that will have graphics in ROM onboard and will allow Applers to use transparently the graphics capabilities of their printers. "The magic is all on a card that you stick in the Apple," says Lynn.

Farther down the track is, of course, a bit hard to see, just as the present would have been for that cookie-baking lady of the clothing business. It seems a safe bet, though, that she and Computer Station will be generating magic for the Apple for some time to come.



Sheri Talbott

"I think in hex."

This is Sheri Talbott explaining one of the reasons machine language coding comes easily for her. Yet software is not Talbott's specialty; she'll avoid it whenever she can.

Talbott's product is the hard stuff—boards. The numerous frames on her office walls hold not pictures but felt-backed, glass-covered peripheral boards. Each is or contains her design.

The most widely known of her designs is the Mountain Clock. Talbott designed both the hardware and the software for this product.

Marriage and Partnership. In school, Talbott started out in graphic design and moved to industrial design. She took a course in engineering and found it to be something she really enjoyed. After earning the bachelor's degree in electrical engineering specializing in microwave and digital technology, Sheri Talbott, whose family still doesn't fully understand her love for engineering, married Gary Muhonen, another engineer, and, after a while, they began a company together. Their product was computer hardware; they soon specialized in hardware for the microcomputer, particularly the Apple.

Talbott designed hardware and loved it. When the company had a move to make, Muhonen and Muhonen decided what to do together, but the female Muhonen chose to be a silent partner. Silent, but strong. One time, when the partners entered a meeting Gary had arranged, one of the men remarked to Gary, "What'd you do, bring your wife?" Sheri didn't make a big deal of it; but, the next day, "Muhonen" ceased to be part of her name; she's been known by her own name ever since.

Talbott thinks of herself as a practical engineer, not a mathematical analyst. As she puts it, "I'm good at making a product a product."

Designing Woman. Now, she's supposedly not doing the physical design of products; she does the product specification and Mountain's engineers do the physical design—"But I'm drawn in," she says, apparently not reluctantly.

Talbott likes her position because she's not dedicated to any one department; so she's able to see all sides. Her position is essentially new product planner. Besides doing specifications for new products, Talbott analyzes the marketplace for demand and sales performance. She also prices new products, determining the cost to make them, the possible price tag for marketing them, and, as a result, how profitable they'll be.

She is also the research department, evaluating hardware

products from other manufacturers, seeing how they're made and how they work, and checking Mountain's products' compatibility with them. She took time for this interview from analyzing the eighty-column boards for compatibility with the Mountain Clock; her Apple sat open, a mass of boards, chips, and cables, with all but one slot filled.

Would Mountain consider entering a competitor into the eighty-column market? "We're not me-tooers," Talbott said. "We'd rather make original products." But it's not out of the question, if none of these does the job properly. Just very unlikely.

The Heart of Mountain. "Mountain was started on love, not money," Talbott says. "We were naive about money. Now that we're successful, naturally, we enjoy the benefits—especially having a house in the country.

"But the responsibility is greater, too, and we find we have to have outside things. So we play racquetball and tennis. And the country home becomes a need."

Talbott sees the future of her career as a combination of computer technology and management. When Muhonen has been away on business, Talbott has become acting president. "But I try never to make a decision while I'm sitting in for Gary, even if I know it's the decision we'll make later. If there's a question on a decision I make, the employees don't know who to go to after Gary's back.

"I suppose I'll have to go into management one day. But the technical work is what keeps me going. It's my stimulus." So top-level management will have to wait a while for Sheri Talbott.

Early in January, Gary Muhonen retired from the presidency of Mountain for the same reason Talbott is reluctant to get into management: he wants to get his hand back in at the engineering level. Replacing him as president is Jim Sedin, a man whom Muhonen admired as his boss some years ago in the microwave industry. Now Muhonen will be working on product development and research.

Where does that put him in relation—businesswise—to Tal-

bott? "Technically, I guess, he'll be working for me," Talbott explains with a twinkle.

A Gift of Value. Sheri Talbott is a gentle woman whose strong, solid handshake gives a hint of the strength of character and personality within. She seems thoroughly happy and at ease with her world, confident of her ability to handle anything life may bring. It's hard for her to admit she's as important as she is, not only at Mountain but in the whole microcomputer hardware design field.

"But, really, I'm very proud," says Sheri Talbott.

And, somehow, hearing the sincerity in her voice and confirming it in her eyes, you feel proud, too, and as if the world were pretty wonderful.



Jeanne George photo

Zena George

Four-year-old Seth can't write much yet; but if you come across him intently marking a large tablet of paper and ask him what he's doing, he'll answer you (you have to ask?) with "writing a program." And, if you stick around, you'll see him go to the Apple and busy himself with much punching of the keys—"programming."

Seth's programs don't do anything yet; but give him a couple of harvest seasons and you can bet they will. Seth has two good examples.

Seth's mother is Zena George, president and hardware designer for Zena Micro Engineering Inc. in Renton, Washington. His father, John Katzka, is coowner and software engineer of the company.

Presidential Equality. "Actually, we work together in an equal partnership," Zena says. "I'm president because I like management and John doesn't." Both also believe the title gives Zena a better chance at deserved recognition.

As a child, Zena worked with her dad in a television repair shop and loved it. But, by high school, she had no ambitions.

"Women just didn't go into engineering fields then, it seemed to me." She was encouraged to be a nurse; yet another strike against her was her accepted fear that her femininity would depart with her entrance into electronics. Although she's overcome such hangups, now she runs into difficulty from the other direction.

"It's still hard. When John and I talk to people, they often don't recognize my ability; they direct their technical conversation to John. Even buying electronic parts, clerks assume I'm buying for someone else and don't know what I'm doing."

Because of this kind of occurrence, Zena, like Sheri Talbott, took back her maiden name and dropped John's surname.

Just a few years ago, Zena was a secretary, dealing with mainframe computers in the office. She loved that aspect of the work, so she enrolled for technical training in digital electronics. Then she met John, who had just bought an Apple. They became addicts.

Seeking Job Security. Soon, both being tired of jobs that really didn't suit them—his in industrial engineering—they determined to find something profitable they could do with their Apple.

The idea they hit upon was designing and producing a security system. Zena did and does all the hardware design and actually builds the hardware. She credits her father, now an engineer for Boeing, with a lot of help by filling in any gaps in her knowledge. John complements the systems with software.

The first security system used a very complex box of equipment outside the Apple. Now the system is contained on a

thirty-two channel I/O board with ribbon cable and connector that goes in a regular Apple peripheral slot and is called and run by John's software. Through the software, the system can interface with a security hookup terminal block; it can hook up to stepmats that set off an alarm; it can hook up to a bell or siren, or to a smoke detector; and it can interface with a modem that will dial you wherever you are with a message.

At Home with the Future. Zena Micro Engineering—the name was John's idea based on Zena's name being unusual and attractive—has expanded into customized energy management systems. This system does several of the tasks Richard Coleman projected for a home of the future in February's *Softalk*. It senses light and heat, then opens and closes solar panels and drapes and controls air flow to the heat exchangers around the fireplace flue accordingly; conversion boards read the temperatures in the house and turn heat outlets on or off; with the proper software, it could also program and run a microwave oven, although Zena believes this unnecessary since the microwave can already be programmed.

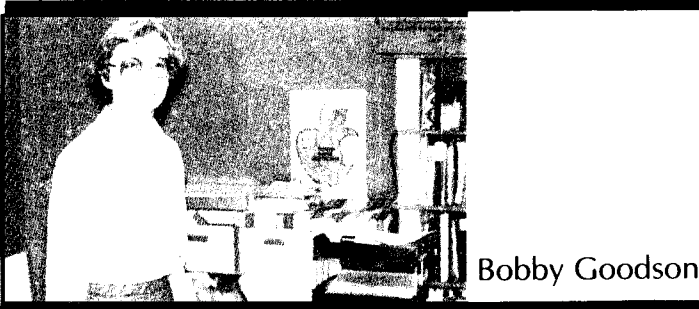
John and Zena had the opportunity to set up a demonstration Apple-run home of the future, a geodesic dome with security system and energy management. It was reported on local television stations as the "Future Home of Tomorrow."

Their other current project came about at the request of a Middle Eastern prince. His Highness wished a car run by computer. Zena and John found that the Astin-Martin had a central, accessible sensor system. Securing an Apple in a shock-resistant metal box with moisture barriers, installing the whole works in the trunk of the car, and accessing the sensor system with shielded cables to avoid rf interference or crosstalk, they created a liquid crystal display dashboard; to top it off in style, an Apple-run voice output reports critical levels.

Imagine driving alone along the highway and suddenly hearing a voice saying, "Excuse me, but you're running low on fuel." It's not coming; it's here.

Triple the Pleasure. Zena George is very glad that times changed enough for her to find her way into electronics and engineering; so is John Katzka; and so, too, will be young Seth, as soon as he is old enough to understand what it's all about.

He will, that is, if he can stop programming long enough to notice.



Bobby Goodson

This year, the funding ran out and some of the classes had to be abandoned; but Goodson remained at Hyde as computer resources teacher. She conducts only one class in the regular curriculum, but holds evening classes for teachers and, most recently, for parents.

Igniting Interest. In teaching the computer to junior high kids, Goodson said, "the stress is not on rigorous programming; it's more computer awareness. But the kids are learning to program anyway. Some are interested from the beginning. Others just go along for a while then, all of a sudden, catch fire."

One reason the kids learn to program anyway is Bobby Goodson's invention of programming cards. She has developed about three hundred two-sided cards, each side with a small program on it along with a little introduction to—but not a full description of—what the program will produce. The kids like to type in a program and see what they get. The hooker is that most of the programs contain a bug the student must figure out how to fix before the program will run. Curiosity and wide variation in the principles needed to correct the bugs lead to lots of learning.

New Type of Student. Typing is no problem for the teenagers. They want to work the computer so they learn to use the keyboard; some become proficient typists. Their typing habits are frowned upon by the school's typing teacher, but, Goodson agreed, by the time these kids are grown up, computers will be so widespread that they'll probably be using computers instead of typewriters anyway.

Goodson has had her own personal computer since the summer after the school obtained one. Last Christmas, her present to herself was a vow to allow herself two hours each morning alone with her Apple.

The future with the computer in education can only get better, if Goodson has anything to do with it. She is busy working out models for computer use in elementary and junior high schools—writing curriculums, planning the computers' integration into the schools.

She was a math teacher at Hyde Junior High in Cupertino, California, when that state's Proposition 13 hit. The state's government budget cutting wouldn't have affected her particularly; but it was that same year that a young man from a local company came to the school to demonstrate a new, inexpensive computer that Proposition 13 prohibited buying.

The teacher was Bobby Goodson, the demonstrator was Mike Markkula, the computer was an early Apple II. It took Goodson no longer than the demonstration and no more than an incisive imagination to recognize the value of the computer to teaching and to life in general.

Entitled to an Apple. Goodson checked the regulation books and found a pathway that might lead to the school's purchasing an Apple at least the following year, 1979. She filed for a Title 4C grant for computer literacy in junior high and was funded enough to learn the computer and try it out.

Apples caught on throughout the school district; their popularity is evident in Goodson's school, where there are seven Apples—which rest only after school hours.

A Cue For Teachers. On the side, Goodson is president of Computer Using Education (CUE), an organization of teachers who are doing something—anything—with computers. The relatively new organization is already eight hundred strong and is spreading worldwide. The group produces a newsletter, but its main function is the organization of conferences. One in September drew seven hundred teachers for two days.

The goal of CUE, to foster professional growth of teachers using microcomputers for learning, expanded to include all people, might be applied to Bobby Goodson since that key day in 1978 when a man came to her school with a new teaching machine that gave her life a new direction.



Ellen Lapham

Some years before becoming president of Syntauri, Ltd., Ellen Lapham had been, among other things, an amateur pilot. She and her husband, a programmer, used to fly around the eastern part of the country, often carrying a terminal on board so they could tie into some time-sharing outlet on the ground and do programming chores for Lapham's father.

They had a nearly fatal mishap in the air one day, and when they finally got the plane safely on the ground, they both walked away from it—and from flying—for good.

Entrepreneur Defined. Perhaps it's not too farfetched to see in this episode a couple of qualities essential to Lapham and to anyone with a strong entrepreneurial frame of mind: a taste for adventure and the willingness to move on decisively at the right time.

Years later, in 1975, when she moved from the East to Palo Alto, California, she left at least a few family traditions behind her, and she did it on little more than a resolve to create a living for herself in the computer business and the conviction that California was the place to do that.

"My family were all three thousand miles away and had no inclination to move. They didn't like California, distrusted California. They still think it's a place for fruits and nuts. They also didn't believe in debt. So what did I do? I went into an MBA program at Stanford, with no money. I took a low-paying job with a start-up company, and I compounded that by buying a house. In one day I went eighty thousand dollars into debt!"

Joining the Revolution. Part of what brought her west were the first stirrings of the microcomputer revolution. In New York State, she had been involved with larger computers, first doing programming in APL on a Burroughs while in business school in Syracuse and later working in computer-aided product design for SCM and General Electric. In 1972 she designed a key-button for an SCM typewriter, using a computerized method of making the tool mold. "I was responsible," she says, "for getting SCM into computer-aided design. They were terrified . . . but they went along with it."

Eventually, however, she decided that the world of main-frame computers was dull and began to look elsewhere. "I saw the microworld as young, open-minded, entrepreneurial. It had a missionary spirit. The micro revolution was also a cultural revolution."

A Day at the Fair. Her introduction to Apple Computer Inc. was of the fairy-tale variety. She was visiting a microcomputer fair with her young son, who was not very keen on being there. She gave him some money and told him to amuse himself for a while. Three hours later, she met Steve Wozniak, with whom her son had spent the entire time playing games on an Apple.

"I wanted to work for Apple because I thought they were a really exciting company," she says. But Apple was barely off the ground at that time, and, since her professional expertise was not electronics directly, but business, there was no place for her then.

Alpha's Beginnings. Later on, though, after a stint with Tandem Computer and five months of trying to salvage a floundering magazine about microcomputers in education, Lapham did go to work for Regis McKenna, doing Apple's public relations.

It was there that she met Charlie Kellner and discovered the opportunity that she had been looking for all along. Kellner, a programmer at Apple, had invented a prototype real-time, Apple-driven, keyboard music synthesizer, and when Lapham saw it, in June of 1979, she told him, in effect, "If you want to produce that commercially, call me and we'll do it."

Kellner called—months later—and the AlphaSyntauri was on the road.

So, once again, was Lapham, who, in addition to being chief executive officer for the growing company, is also its chief spokesperson, salesperson, and demonstrator. Roughly half of life now is spent away from home, speaking to educators, visiting musicians, doing demos for dealers.

Getting the Show on the Road. Part of what she is doing in all this travel is trying to spread a little entrepreneurial spirit around. "I'm trying to persuade dealers that the AlphaSyntauri is a good way to get rich." The other part is seeing and learning what musicians who already have the instrument are doing with it.

Syntauri, she says, has tied together a lot of things for her—including a love for music, a desire to do something really creative with computers, and a need to run her own show. And what with all the new places the venture is taking her, both literally and metaphorically, the taste for adventure seems to be served as well.

Softalk Presents The Bestsellers

A shortage of Apples severely impacted the sales of business software in the month of January, leaving the Top Thirty field wide open for the entertainment programs.

That first wonder of the microcomputer world, *VisiCalc*, seemed to be the only business program immune from the doldrums as it continued to swamp all competition with the exception of Broderbund's *Apple Galaxian*. But retailers were reporting considerably slower sales and delivery of data base and word processing programs, most of which find their strongest sales in the business area.

It seems almost redundant to report that January's sales reached nowhere near the peak of software sales of the December Christmas season. The inevitable winter slowdown, plus the relative lack of hot new product, caused the Top Thirty, with the exception of the first nine programs, to be as tightly bunched as in any month since the poll began.

A part of this phenomenon may be the increased presence of the businessman/hobbyist—the professional who carts his Apple home at the end of the work day. That breed of user seems to be bringing a wider spread of entertainment interests to the maturing Apple market.

But even this new kind of Apple user couldn't blunt the surge of Tony Suzuki's *Apple Galaxian*. Thought to be a one-time,

Business 10

This Last
Month Month

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|-----|----|---|
| 1. | 1. | <i>DOS 3.3</i> , Apple Computer Inc. |
| 2. | 3. | <i>Typing Tutor</i> , Image Producers, Microsoft |
| 3. | 2. | <i>DOS Tool Kit</i> , Apple Computer Inc. |
| 4. | 4. | <i>Bill Budge's 3-D Graphics Package</i> , Bill Budge, California Pacific |
| 5. | 6. | <i>Super Disk Copy</i> , Sensible Software |
| 6. | 8. | <i>LISA Assembler</i> , Randy Hyde, Programma |
| 7. | 5. | <i>Enhanced Paper Tiger Graphics</i> , David K. Hudson, Computer Station |
| 8. | — | <i>E-Z Draw</i> , Jerry Jewell and Nasir, Sirius Software |
| 9. | — | <i>TellStar</i> , Evan M. Scharf, Information Unlimited Software |
| 10. | 7. | <i>Apple World</i> , Paul Lutus, United Software of America |

Home/Hobby 10

This Last
Month Month

- | | | |
|-----|-----|---|
| 1. | 1. | <i>VisiCalc</i> , Software Arts Inc./Dan Bricklin and Robert Frankston, Personal Software |
| 2. | 2. | <i>Apple Plot</i> , Apple Computer Inc. |
| 3. | 3. | <i>Data Factory</i> , Bill Passauer, Micro Lab |
| 4. | 9. | <i>DB Master</i> , Alpine Software/St Stanley Crane and Barney Stone, Stoneware |
| 5. | 8. | <i>Apple PIE</i> , Tom Crossley, Programma |
| 6. | 6. | <i>Apple Writer</i> , Apple Computer Inc. |
| 7. | 10. | <i>Supertext II</i> , Ed Zaron, MUSE Software |
| 8. | 4. | <i>CCA Data Management System</i> , Creative Computer Applications, Personal Software |
| 9. | 5. | <i>Easy Writer</i> , John Draper, Information Unlimited Software |
| 10. | 7. | <i>BPI General Ledger</i> , John Moss and Ken Debower, BPI |

Christmas gift-giving phenomenon, the program has clearly captured the imagination of a diversified group of Apple owners. It outsold every other entertainment program by a two-to-one margin in January and now appears to be taking on the coloration of *Super Invaders* as a must program for Apple owners.

Of particular note about entertainment programs in January were the following:

Scott Adams, who once had the adventure genre all to himself, made a rousing comeback with *Adventure 10: Savage Island*.

Ken and Roberta Williams, whose hi-res adventures had eclipsed the field, dominated the Top Thirty with four programs in the top eleven.

Nasir, who has become the new darling of the arcade genre fans, did it again with *Phantoms 5*. Even though the program was only in distribution for the last two weeks of the month, it climbed into the first ten.

No new programs achieved the Business 10 in January.

Apple-franchised retail stores representing approximately 12 percent of all sales of Apple and Apple-related products volunteered to participate in the poll.

Respondents were contacted early in February to ascertain their sales leaders for the month of January.

The only criterion for inclusion on the list was number of sales made—such other criteria as quality of product, profitability to the computer retailer, and personal preference of the individual respondents were not considered.

Respondents in February represented every geographical area of the continental United States as well as Hawaii and Alaska.

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 relative strength of the programs listed. Index numbers are correlative only for 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 number of 50 in another month.

Probability of statistical error is plus-or-minus 4.3 percent, which translates roughly into the theoretical possibility of a change of three points, plus or minus, in any index number.

This was probably attributable to the slow overall sales of business software that month. Most noteworthy occurrence in the Business 10 is the hotly waged battle between Micro Lab's *Data Factory* and Stoneware's *DB Master* for preeminence in the field of data bases.

Two new programs made the Home/Hobby 10 in January. *E-Z Draw* from Sirius Software jumped to eighth. *E-Z Draw* is the creation of Jerry Jewell with finishing touches by Sirius's star, Nasir.

The other newcomer was Information Unlimited's *TellStar* by Evan Scharf, which climbed to ninth in its first month of national distribution.

A final note corrects errors of attribution in the February issue. *Easy Writer* was correctly attributed to Information Unlimited in the Top Thirty but incorrectly attributed to Information International in the Business 10 list. And *Enhanced Paper Tiger Graphics* was incorrectly attributed to Granite Station on the Home/Hobby 10. Actual publisher is Computer Station, which is located in Granite City, Illinois. Both programs made their respective lists again this month. ■

The Top Thirty

This Month	Last Month	Index	
1.	1.	99.06	<i>Apple Galaxian</i> , Tony Suzuki, Broderbund Software
2.	2.	68.56	<i>VisiCalc</i> , Software Arts Inc./Don Bricklin and Robert Frankston, Personal Software
3.	3.	45.63	<i>Flight Simulator</i> , Bruce Artwick, SubLogic
4.	20.	40.43	<i>ABM</i> , Silar Warner, MUSE Software
5.	4.	39.96	<i>Hi-Res Adventure #2: The Wizard and the Princess</i> , Roberta and Ken Williams, On-Line Systems
6.	—	31.45	<i>Hi-Res Adventure #0: Mission: Asteroid</i> , Roberta and Ken Williams, On-Line Systems
7.	7.	26.72	<i>Hi-Res Football</i> , Jay Sullivan and Ken Williams, On-Line Systems
8.	11.	26.01	<i>DOS 3.3</i> , Apple Computer Inc.
9.	—	25.06	<i>Phantoms 5</i> , Nasir, Sirius Software
10.	6.	20.81	<i>Dogfight</i> , Bill Basham, Micro Lab
11.	24.	20.33	<i>Hi-Res Adventure #1: Mystery House</i> , Roberta and Ken Williams, On-Line Systems
12.	—	19.86	<i>Adventure 10: Savage Island</i> , Scott Adams, Adventure International
13.	13.	19.15	<i>Apple Plot</i> , Apple Computer Inc.
14.	8.	17.97	<i>Sargon</i> , Dan and Kathe Spracklen, Hayden
15.	19.	17.26	<i>Odyssey</i> , Bob Clardy, Synergistic Software
	18.	17.26	<i>Typing Tutor</i> , Image Producers, Microsoft
17.	15.	15.37	<i>Hellfire Warrior</i> , Automated Simulations
18.	10.	14.90	<i>Cyber Strike</i> , Nasir, Sirius Software
19.	17.	14.42	<i>DOS Tool Kit</i> , Apple Computer Inc.
20.	5.	13.48	<i>Super Invader</i> , M. Hata, Creative Computing
	14.	13.48	<i>Bill Budge's Space Album</i> , Bill Budge, California Pacific
22.	26.	13.00	<i>Planetoids</i> , Marc Goodman, Adventure International
23.	25.	12.77	<i>Temple of Apshai</i> , Automated Simulations
	—	12.77	<i>Lords of Karma</i> , National Microcomputer Associates, Avalon Hill
25.	28.	12.29	<i>Planet Miners</i> , National Microcomputer Associates, Avalon Hill
26.	16.	12.06	<i>Data Factory</i> , Bill Passauer, Micro Lab
27.	—	11.82	<i>DB Master</i> , Alpine Software/St Stanley Crane and Barney Stone, Stoneware
28.	8.	11.59	<i>Star Cruiser</i> , Nasir, Sirius Software
29.	21.	11.11	<i>Adventure</i> , Software Associates/Gordon Letwin, Microsoft
	26.	11.11	<i>Bill Budge's 3-D Graphics Package</i> , Bill Budge, California Pacific