SOFTALK

VOLUME 1 OCTOBER 1980 $1

Pirate, Thief.
Who Dares to Catch Him?

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The VisiCalc People

Software Bestsellers

Apples and the Handicapped

WE CAN TAKE YOU FROM WATERLOO TO THE SUPER BOWL. (By way of the North Atlantic.)

In the few short months since we introduced Computer Bismarck™, we've transported over 2500 adventurous minds to the North Atlantic – there to recreate the historic battle between the awesome German warship and the British Home Fleet. The startling realism and excitement of that experience have prompted many well-seasoned travelers to proclaim it "...unique among computer games and board games alike.*" One enthusiast had this to say: "The wealth of detail...is hardly short of fantastic. Only real war rooms...in the Pentagon have ever before been able to simulate a battle in this manner.**" Now we offer two more strategy games to embark you on new flights of the imagination.

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THE COMPUTER, in our solitaire scenario, plays Wellington while you play Napoleon. Two levels of play are provided by making the entry of Prussian reinforcements variable. This makes the need for French military decisiveness and devastating execution even more critical.

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After you have mastered the Semi-Pro version, it's time to move on to the Big Time...the Pro version!

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*Creative Computing, Aug. 1980.
**Popular Mechanics, Aug. 1980.

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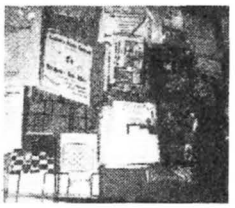

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CONTEST:
BOBBING FOR APPLES

Can you find all the apples in this issue of *Softalk*? The reader who comes closest to the actual number of apples, any kind of apples, in the magazine will win $100 in goods produced by any advertiser in this issue.

There are apples—the eating kind—hidden throughout these pages, some a bit obscured, some right out in the open. Then there are Apples, the thinking kind; they count too, even in ads. And to make it all a challenge, there's the written kind: the word *apple,* or *Apple,* singular or plural, in combination or alone, in articles or in ads or anywhere else. Count those too. Tote them up, write your answer on the coupon or on a copy of it, include your name, address, and your dealer's name, and mail it in.

Even if you don't win the gift certificate, you could win *Goblins* (by Programma) or a *Haunted House* (by Adventure International); second place winner gets both, third place chooses either one. Ties will be broken by earliest postmark, remaining ties by Apple at random. Deadline: Halloween.

Mail completed coupon or facsimile to Bobbing for Apples, Softalk, 10432 Burbank Boulevard, North Hollywood, CA 91601.

I counted _____ apples in the October 1980 *Softalk*. I've examined the ads in this issue. In case I win, the prize or prizes I'd like are _____

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City: _____ St: _____ Zip: _____ Dealer: _____

Your Signature: _____

(Contest is open to all Apple owners and their immediate families except those associated in any way with *Softalk*. Use of computers in deriving answers to this contest is strictly encouraged. Multiple entries are acceptable, but you may not enter more than one set of entries on a coupon. Photocopies of the coupon are okay, as are handmade copies on a plain sheet of paper, the back of an envelope, the margin of your daily newspaper, whatever, as long as they're legible and reproduce the entire coupon.)

TRADETALK

☐ **Advanced Business Technology** announced the appointment of **Tamisie Honey** to the position of product manager. In the newly created position, in charge of directing worldwide sales, marketing, and production of ABT's expanding line of Apple peripheral products, Honey reports directly to ABT pres **James Tennyson.**

Left: Tamisie Haney, product manager, Advanced Business Technology. Right: Peter Eisenhauer, vice-president of marketing and sales, Integral Data Systems.

☐ **Peter R. Eisenhauer** has been appointed vice-president of marketing and sales for **Integral Data Systems,** according to company pres **James E. Vander Mey.** As before, Eisenhauer will be responsible for all worldwide sales and marketing for IDS, but his newly created position adds to his duties responsibility for long-range corporate development.

Eisenhauer has been with IDS since September 1978 as director of marketing and sales. The company's present 100 percent annual growth rate represents the popularity of its Paper Tiger line of printers.

Reporting to Eisenhauer will be new director of OEM marketing, **Mel W. Bosch.** Bosch, formerly vice-president of European sales for Dataproducts Corporation, brings twenty years' experience in computer peripheral and related fields to the new position at IDS.

☐ **James F. Mulholland, Jr.,** president of **Hayden Book Company** (Rochelle Park, New Jersey), has announced the acquisition of **Programma International** (Los Angeles, California). **Dave Gordon** has been named vice-president and general manager of the Programma division, which will remain a separate software publishing entity. Sales policy of Programma will remain the same, but be enhanced by Hayden's fifteen field sales representatives. Combined company has the largest line of software available for the Apple computer.

☐ **Corvus Systems,** manufacturer of top quality Apple compatible hard disk drives, has moved from Winchester Boulevard to 2029 O'Toole Avenue, still in San Jose, California. New zip is 95131.

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If you wish additional or back copies of *Softalk*, please give month of issue and quantity and enclose check or money order.

Softalk Publishing Inc. distributes *Softalk* free of charge to owners of Apple computers. Our circulation lists are extensive, yet there remain several thousand Apple owners unknown to us.

If you received this issue of *Softalk* in the mail, we have your name in our circulation file, and you'll continue to receive *Softalk*.

However, if you bought this issue of *Softalk* at your local computer store, or if you're reading this copy at a friend's house, you'll need to fill out the coupon (or a facsimile of it) to ensure receiving the magazine regularly. Be sure to include the serial number of your Apple; you'll find it on the bottom of your machine.

An alternative to filling out the coupon is to ask your dealer if the store participates in *Softalk*'s dealer mailing program. If it does, your dealer can make arrangements for you to receive the magazine.

Additional copies of this issue or back copies of the September premiere issue can be purchased directly from Softalk Publishing Inc. for $1.15 each.

Assembly Lines

by Roger Wagner

Everyone's Machine Language Guide, Part 1

One often gets the impression that programming in assembly language is some very difficult and obscure technique used only by "those advanced programmers." As it happens, assembly language is merely different, and if you have successfully used Integer or Applesoft Basic to do some programming, there's no reason why you can't use assembly language to your advantage in your own programs.

This series will take a rather unorthodox approach to explaining assembly programming. Since you are presumably somewhat familiar with Basic, we will draw many parallels between various assembly language techniques and their Basic counterparts.

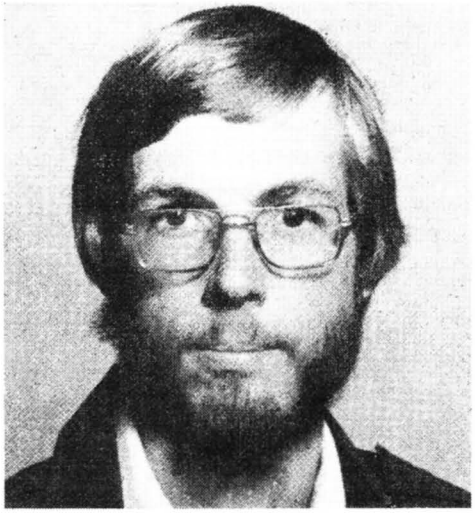
An important factor in learning anything new is a familiar framework into which to fit the new information. Your knowledge of Basic will provide that framework.

We will also try to describe initially only those technical details of the microprocessor operations as are needed to accomplish our immediate goals. The rest will be filled in as we move to more involved techniques.

The first of the technical details is the general structure, or *architecture,* of the Apple itself. The heart of the system is the 6502 microprocessor. This device operates by scanning through a given range of memory addresses. At each location it finds some particular value. Depending on what it finds, it executes a given operation. This operation could be adding some numbers, storing a number somewhere, or any of a variety of other tasks. These interpreted values are often called *opcodes.*

In the old days, programmers would ply their trade by loading each opcode, one at a time, into successive memory locations. After a while, someone invented an easier way, using short abbreviated words (called *mnemonics*) for the operations. The computer would then figure out which values to use and supervise the storing of these values in consecutive memory locations. This wonder is what is generally called an assembler. It allows us to interact with the computer in a more natural way. In fact, Basic itself can be thought of as an extreme case of the assembler. We just use words like *PRINT* and *INPUT* to describe a whole set of the operations needed to accomplish our desired action.

In some ways, assembly language is even easier than Basic. There are only fifty-five commands to learn, as opposed to more than one hundred in Basic. Also, machine code runs very fast and generally is more compact in the amount of memory needed to carry out a given operation. This opens up many possibilities for programs that would either run too slowly or take up too much room in Basic.



Roger Wagner, president of Southwestern Data Systems, authored *Apple Doc, the Programmer's Utility Package,* which was the first Applesoft renumber program; the *Correspondent;* and *Roger's Easel,* which he refers to as "my sleeper program." Before he discovered the Apple, Roger taught math and science at Mountain Empire High School.

How the 6502 Talks to Itself. Probably the most unfamiliar part of dealing with the Apple in regard to machine level operations is the way addresses and numbers in general are treated. Unless you lead an unusually charmed life, at some point in your dealings with your Apple you have had it abruptly stop what it was doing and show you something like this:

```
8BF2- A=03 X=9D Y=00 P=36 S=F2
```

This occurs when some machine level process suddenly encounters a break in its operation, usually from an unwanted modification of memory. Believe it or not, the Apple is actually trying to tell us something here. Unfortunately, it's rather like being a tourist and having someone shout, *"Alaete quet beideggen!"* at you.* It doesn't mean much unless you know the lingo, so to speak . . .

* "Watch where you're stepping, you nerd!" (in case you're not familiar with this particular dialect.)

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Assembly Lines

What has happened is that the Apple has encountered the break we mentioned, and in the process of recovering, has provided us with some information as to where the break occurred and what the status of the computer was at that crucial moment. This is rather like the last cryptic words from the recently departed.

The leftmost part of the message is of great importance. This is where the break in the operation occurred. Now, just what do we mean by the word *where*? Remember all that concern about whether you have a 16K, 32K, or 48K Apple? The concern was about the number of usable memory locations in your machine. This idea becomes clearer through the use of a *memory map*, such as the one shown in figure 1.

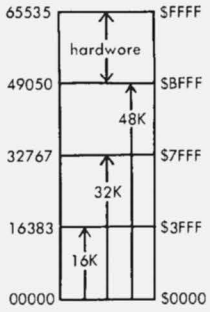

Figure 1.

Inside the Apple are many electronic units that will store number values we give them. By numbering these units, we give each one a unique *address*. This way we can specify any particular unit or memory location, either to inquire about its contents or to alter those contents by storing a new number there.

In the Apple there are a total of 65,536 of these memory locations (incidentally called *bytes*). The chart gives us a way of graphically representing each possible spot in the computer.

When the computer shows us an address, it does not do it in a way similar to the numbers on the left of the memory map, but rather in the fashion of the ones on the right. You may well remark here: "I didn't know 'BFFF' was a number; it sounds more like a wet sneaker. . . ."

To understand this notation, let's see how the 6502 counts. If we place our byte at the first available location, it's address is $0. The dollar sign is used in this case to show that we are not counting in our familiar decimal notation, but rather in hexadecimal (base sixteen) notation, usually called "hex," which is how the computer displays and accepts data at the monitor level.

After byte $0, successive locations are labeled in the usual pattern up to $9. At this point the computer uses the characters A through F for the next six locations. The location right after $F is $10. This is not to be confused with "ten." It represents the decimal number sixteen. The pattern repeats itself as in usual counting with:

$10, 11, 12, 13 . . . 19, 1A, 1B . . . 1E, 1F, 20

This method should be accepted just as a fact of life with the Apple for the time being. If you really can't stand not knowing the details of the reasoning behind this scheme, there are quite a number of books on number theory and number bases that you might peruse. Many books on assembly language also spend a chapter or two on this. It will be sufficient for our purposes, though, just to understand that $1F is as legitimate a number as 31.

GOTO 20

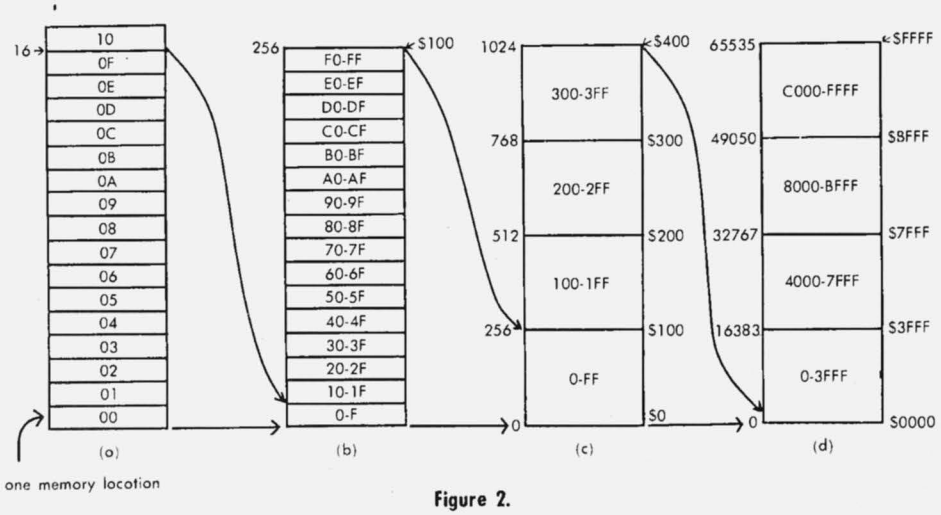

Figure 2.

NEWSPEAK

☐ **Sharing Apple.** You've probably already read it in the newspaper or in *Newsweek*, but since the story is of special interest to Apple owners, here it is again:

Apple Computer Inc. will become a public corporation later this year. According to the *Wall Street Journal*, investment firms were quick to compete for the business as soon as word of the pending Apple offering reached them. In the end, two firms will be handling the original $25 million stock offering: Morgan Stanley and Company and Hambrecht and Quist. The reason for the strong interest, at least according to James Berdell of Montgomery Securities, will be no news to *Softalk* readers: the Apple is the "Cadillac of the industry," says Berdell.

The reasons for Apple's decision involve faster-than-anticipated growth combined with a market receptive to high-technology stocks. Also, according to the *Journal*, because of Apple's employee incentive plan (another way of saying Apple workers can own a piece of the fruit) and its employee population explosion, Apple is very close to the mark at which it would have to adhere to public-company reporting practices required by the federal securities regulations. Apple's revenue is approaching $150 million for 1980 and is expected to double next year.

☐ **Apple Beats FCC to Leaden Punch.** Apple has distributed to retailers a modifier kit that brings the radio frequency interference (RFI) of the Apple's interfacing with television sets closer to levels acceptable to the FCC's rulemaking now in progress, which, Apple's Tom Whitney explains, "we helped support all along." All systems manufactured and sold after January 1981 will be required to meet the established levels. In the meantime, Apple has instructed Level 1 service centers to perform this modification free on all Apples brought to them for modification. Apple Computer will, of course, reimburse the retailers in turn.

☐ **New Mother Board Rejects Chip.** Dan Paymar's *Lower Case Adapter*, the chip that's the almost universal lower case adapter for the Apple, won't work with Apple's new mother board. So Paymar has made a revision chip that will. "The new chip will be available in the stores in two weeks," Paymar promised in mid September. But buyer beware—it will only work with the *new* mother board. You still need the earlier version chip for the earlier version mother board.

☐ **Curious Observation.** The personified names of computer chess games seem to contain a certain irony. Microcomputer chess games bear names such as Boris and Sargon. But the big mainframe games that appeared last month at the World Computer Chess Tournament in Linz, Austria, answer to names such as Duchess and Belle. . . .

Softalk *welcomes timely contributions to Newspeak. If you're the first to send in an item we use, we'll send $5 to your computer store to be applied against your next purchase. Include the source and date with your contribution, and don't send anything that must be returned. Items from local newspapers and special interest publications are more likely to be used than those from national general interest publications and from publications widely read by computer owners. Send to Newspeak, Softalk, 10432 Burbank Boulevard, North Hollywood, CA 91601.*

Moir/The Bulletin/Sydney/Reprinted from World Press Review/April 1980

In the future, *Softalk* will carry a letters section, called "Open Discussion." And discussion is what we encourage you to undertake, between readers, between readers and authors, between readers and editorialists. But mostly between readers. Subject matter is what you make it.

If we run your letter, you won't win anything, except, we hope, an answer—from another reader, from a writer, from an editorialist. But mostly from other readers. And you can answer back, too. Because it's

OPEN DISCUSSION

(Beginning when you fill it, in *Softalk*, the Apple news and feature magazine.)

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NEW PRESIDENT AT HELM; SMOOTH SAILING ON ANY SEAS

In the minds of many in the microcomputer industry, Personal Software is closely associated with Apple Computer Inc., even though they are completely independent entities.

This association stems from the remarkable similarity of approach to business shared by the two firms, a similarity that's no accident according to Dan Fylstra, chairman of the board and chief executive officer of Personal, as well as one of the founders.

They're "Doing an Apple." "We looked around the industry and liked what we saw of Apple, so we applied those elements of success that were germane to our business and made them our own."

It should come as no surprise then that one of the successful techniques adopted by Personal was "doing an Apple," a recruiting technique whereby seemingly overqualified executives are brought into the company, apparently prematurely, allowing the company room to grow to the capabilities of its top management.

In Personal's case, application of this technique took the form of a major executive realignment in August.

Fylstra, then president, vacated that post to move to his current position. Founder Peter Jennings, who had held the chairmanship, chose to assume responsibilities as the vice-president of advanced research and development.

Fate Arrives from Michigan. Recruited into the position of president and chief operating officer was Terry Opdendyk, formerly on the corporate staff of Intel.

There's an aura of kismet about the management team of Fylstra and Opdendyk. Both grew up in Grand Rapids, Michigan, although they didn't know each other at the time.

When Opdendyk was at Hewlett-Packard, he had occasion to interview Fylstra, who was thinking of leaving the Massachusetts Institute of Technology; Opdendyk advised continued schooling. Fylstra followed that course—whether on Opdendyk's counsel is speculative.

Their paths did not cross again until early this year. Personal had just been the recipient of a $500,000 private placement from Arthur Rock and Venrock Associates. Fylstra, Jennings, Rock, and Hank Smith—Smith representing the investment banking house—agreed on a course of company development that included bringing in an experienced chief operating officer.

It was Smith who raised the possibility of attracting Opdendyk to the position, thus uniting the two Michigan natives in a common destiny.

Opdendyk needed considerable persuading to recognize the opportunity being offered, however.

In many ways Opdendyk's career parallels that of John Couch, vice-president of software for Apple Computer; in fact, during one period, they were peers at Hewlett-Packard.

Opdendyk pursued degrees in computer science at Michigan State and Stanford universities, receiving the bachelor's from the first and the master's from the second. He began work on his Ph.D. at Stanford before being lured to H-P with the result that he, like Couch, can claim the ABD, *all but dissertation*, degree.

On the Intel Crew. In 1973, Opdendyk left H-P for Intel, the semiconductor manufacturer. Intel had just developed a single chip with the approximate power of then existent minicomputers. It was, of course, one of the earliest microprocessors; but it nonplussed Intel's management, who recruited a whole new team to realize the commercial potential of this revolutionary device. Opdendyk was a member of this new team.

GOTO 8

EXEC PERSONAL: THE VISICALC

VisiCalc execs: Above: Founders Peter Jennings (left) and Dan Fylstra. Left to right: Terry Opdendyk, president and chief operating officer; Bill Langenes, vice-president of marketing services; Ben Cushman, director of sales; and Jeff Walden, marketing communications manager.

LIKE THE COUNTRY, IT ST

In January 1978, Dan and Hilary Fylstra invested in a classified ad to announce their first program for the burgeoning microcomputer industry.

Within months their small Cambridge, Massachusetts, apartment was overflowing with software product, documentation, and packaging materials.

Conventional wisdom would have it that there was no place to go but down for such a shoestring operation. Resources stretched to the maximum have almost always been the downfall of such humble beginnings.

Innovation over Convention. Conventional wisdom, however, fails to account for the innovative and unconventional mind; and so it was that, far from going belly up in a morass of unbusinesslike systems, procedures, and practices, the Fylstras succeeded in founding what is today very likely the largest software publisher in the microcomputer industry.

It is difficult to conceive of another software publisher who, exclusively through that business activity, has reaped as bountiful rewards as Personal Software, the successor company to the Fylstras' mail-order operation.

Personal has published two of the largest-selling programs in microcomputer history—*Microchess* and *VisiCalc*—and has a companion line of products that move regularly.

"Veteran" Tops the List. Results of *Softalk*'s bestselling software poll indicate that *VisiCalc* retains its preeminent position as the top seller in the industry, even a full year after its introduction into the marketplace.

This staying power in a usually fickle market stands as testimony to the revolutionary aspects of the *VisiCalc* tool and to the foresight of Personal's management in investing their company's future in the product.

Invest their company's future is exactly what founders Dan

PEOPLE

BY ALLAN TOMMERVIK

Softalk Photos

RTED IN MASSACHUSETTS

Fylstra and Peter Jennings did to develop *VisiCalc*, and therein hangs a tale.

A few paragraphs prior, we left Dan and Hilary Fylstra with an apartment full of product, bucking the odds that such confusion could ever lead to anything particularly worthwhile.

The Handicapped Help. From this chaos, the pair made order. They employed Western Union's answering service and a microcomputer-based order processing system to handle the paperwork and a rehabilitation organization to do packaging and assembly, clearing their apartment of material.

Dan's educational background, the bachelor's degree in electrical engineering from MIT and the master's degree in business administration from Harvard Business School, and his experience in the computer world brought him much earlier than most to realize that arcade-type games and mail-order sales were not the foundations of a strong software publishing venture.

Soon after this awakening, Fylstra met Canadian Peter Jennings, developer of *Microchess*. Jennings, who holds bachelor of science and master of business administration degrees from McMaster University and the master of arts degree from the State University of New York, was of like mind with Fylstra about the future of the microcomputer industry.

Partners Get Personal. They joined forces and, late in 1978, Personal Software was formed. The excellence of Jenning's *Microchess* program and astute marketing by Fylstra led to instant success.

The concept of more serious software remained, however, and now, with the monetary resources to pursue that goal at hand, Jennings and Fylstra adopted a course of action that literally meant make-or-break for the company.

They took nearly every dollar of profit from the sales of *Microchess* and funded the software development of *VisiCalc* by Dan Bricklin and Bob Frankston of Software Arts, Inc. Before the first marketable copy of *VisiCalc* was approved, $100,000 of *Microchess* revenue had been sunk into the program.

Interactivity Planned for Professionals. Fylstra says the *VisiCalc* effort typifies the modus operandi of Personal. "We're constantly trying to do too much . . . always pushing our resources to the maximum." Since Personal's move to Sunnyvale, in the heart of California's computer industry, the company has grown to a staff of nearly thirty.

The emphasis, according to Fylstra, "is to maintain the high standard set by *VisiCalc* and to provide an integrated family of products for the businessman and professional." Such products would be interactive, permitting data to be shunted between various programs and allowing the user to perform divers manipulations on the data.

Fylstra's philosophy is "to concentrate on a project and do it well. We don't worry about what the competition is doing; if we do our job well enough, we'll be rewarded in the marketplace."

A Piece of the Rock—and Venrock. Personal has done so well to this juncture that they've attracted the attention of Wall Street. They recently announced receipt of $500,000 in private placement funds from Arthur Rock and Venrock Associates, venture capital arm of the Rockefeller family.

Fylstra explains, "We didn't need the money so much as we needed the management expertise that involvement by people such as Arthur Rock can provide. The money ensures our financial stability; Arthur Rock and Venrock's management guidance will promote our using the resources wisely."

"One of my greatest concerns is that our success will breed complacency," says Fylstra.

For a company that escaped from a Massachusetts apartment to become a major software force in the rapidly growing microcomputer industry, that seems a minor hurdle. ■

OPDENDYK

from page 6

During his seven years with Intel, Opdendyk contributed in almost every management area to the development and commercial exploitation of Intel's microprocessor. He managed systems and software development and helped design the architecture of early Intel systems. Subsequently, he was manager of the systems engineering organization; he also managed one of Intel's business segments.

At one time, one hundred fifty software engineers, the publications department, and the engineering service group functioned under his aegis.

Later Opdendyk was involved in the startup of various geographic support sites, starting with the Israeli software support group. From those duties, he was elevated to the corporate staff in charge of human resources development, a critical management position in an explosively growing industry with a shortage of trained and skilled personnel.

With that kind of background, it is a wonder that Opdendyk was receptive at all to moving to the software publishing industry—an industry mostly known for its fragmentation, in which few companies have anything resembling a full product line or a businesslike approach to marketing and distribution.

But conversations with Fylstra and Smith convinced Opdendyk that Personal's approach to software publishing was more businesslike than the stereotypical software house. That conviction was a telling point in his decision to join Personal.

Likewise, Opdendyk's background would seem to make him the perfect catalyst for the explosive growth projected for the company—200 percent yearly for the next four years.

From Hewlett-Packard, Opdendyk brings a reverence for quality product and an understanding of the patience required to achieve excellence in high technology areas. From Intel, he brings an understanding of how to harness astronomical

Handicapped Get Personal Boost

An article on Apples being used by handicapped people, beginning on page 22, describes the capabilities of the Apple to help handicapped people improve their lives.

The fallout from the explosive growth of the microcomputer industry has also benefited the handicapped.

Personal Software has a long-established policy of contracting out their assembly and packaging work. This policy began in 1978 when founder Dan Fylstra contacted Skip Vaccarello, who was then in charge of a rehabilitation program in Boston, Massachusetts. Vaccarello's organization immediately assumed responsibility for assembling and shipping of Personal's products.

When Personal moved west to Sunnyvale, California, in early 1979, Vaccarello was recruited as vice-president of operations and manufacturing.

Skip Vaccarello

In Personal's new location, Vaccarello made contact with Hope Rehabilitation Services in San Jose to assume the packaging tasks.

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growth rates in such a fashion that they will produce profits for reinvestment to fuel more growth.

Personal Growth vs. Personnel Shortage. Opdendyk's last post at Intel—manager of human resources development—has given him insight regarding one of the more serious problems facing the industry—the lack of trained personnel.

"There's a shortage of software programmers and a critical scarcity of high-quality people. Development in the universities is comparatively flat. Their computer science programs are growing at a rate of 15 percent to 25 percent per year, which is considered tremendous growth in academia.

"However, most high-technology companies are experiencing a demand growth of 50 percent, and some companies, like Intel, are looking at 200 to 300 percent growth in demand for trained personnel in the next two years."

Opdendyk's Intel experience will enable him to avoid some of the pitfalls that accompany the dilemma of growth despite a personnel shortage.

"The high-technology companies are finding it impossible to grow at 100 percent or more per year and give total service to the market. They require reinvestment of profits in research and development to feed their growth; as a result, they barely keep up with the basic needs of the marketplace.

"Furthermore, it's impossible for any company to develop applications software for all of the thousands of applications that exist. But companies that attempt to stretch too far eventually run into the problem that the learning curve for their newer, less qualified employees is too long and too expensive.

"As the company grows in size, the management structure begins to dominate and funds are siphoned away from the creative process."

Opdendyk recognizes the long lead times required for research and development and steers away from institutionalizing those functions as in-house activities at Personal.

To control the extensive financial commitments being made to independent software producers, Personnel recruited Nick Scharf, formerly controller at Tandem, as vice-president of finance. During Scharf's stewardship at Tandem, the company grew from seven million to seventy million dollars in yearly sales.

Programmers Can Forego Conforming Premises. "What we're trying to do is share our technology and expertise with the small, one-to-ten-man software houses that exist. We're finding more and more that brilliant programmers have many of the eccentricities of brilliant writers. Their lifestyles and work habits don't conform with those of the majority in the business world. Our structure maximizes their freedom while also maximizing their potential return."

What Personal offers to the independent programmer is a package that includes quality assurance, documentation services, a warranty program, a strong distribution network, and advance word on hardware changes that may affect software development.

Opdendyk has hired Gene Buechele from Intel for the job of

GOTO 26

To Vaccarello, this contracting for services makes good business sense. "The Hope people have an expandable work force. They can call on as many as two hundred people if needed to respond to our requirements.

"This obviates the need for us to go into the labor market for part-time help or to staff for peak periods and suffer from the down-time that would occur during slower times.

"Hope's rates are very competitive and they've saved us money in some ways. Because they have a shrink-wrap machine, we didn't have to invest in one; and they are willing to inventory some materials for us, which relieves us of the necessity of expanding our storage facilities."

Hope Rehabilitation Services has been responsive to Personal's requirements and has, according to Vaccarello, excellent quality control procedures.

There's an additional payoff. "We're able to give something back to the community." For benevolent people, that's always rewarding. ■

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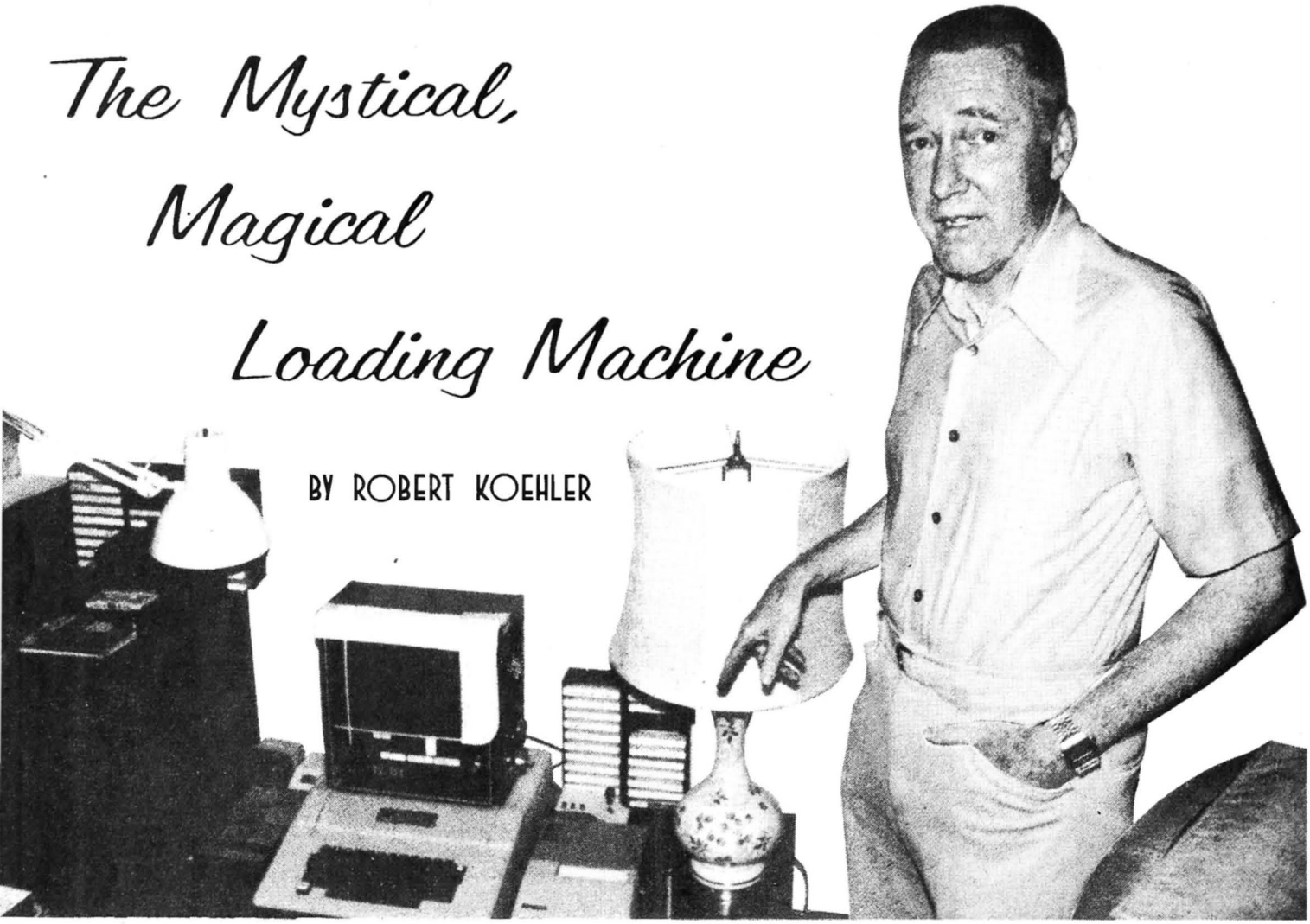


When Frank Krogh walked into his local computer store a year ago, he suddenly found himself in the grip of an inflationary vise. He was eager to expand the possibilities of his basic unit and aware that, in the world of the microprocessor and semiconductor, the price of the product is bound to go progressively down or, at least, remain stable. But stability, acceptable to many, was utterly prohibitive to Krogh.

He wanted the primary accessory: the disk drive. In his local computer store a year ago, the going price was nearly six hundred dollars, and six hundred dollars was simply beyond Frank Krogh's pocketbook.

Loads of Frustration. There were alternatives, the only economically viable one being cassette tape. Krogh considered himself warned of the potential loading difficulties as he made his purchase; what no one could know was that this was the nascent stage of an experiment that led to an invention.

At first, however, it led to a wave of frustration. No matter how closely Krogh fine-tuned the playback levels and tone, his monitor would respond with the souring word *ERR* upon load. A man can be told that he's wrong only so many times and then call the whole thing off. Undaunted, Krogh just called it a night, knowing that somewhere, the key existed to unlock this electronic bolt.

The best his store could do for him was to give him three load-tested tapes. Krogh had no desire to pass another evening with ERRs assaulting him from his screen, and when his "tested" tapes did not pass this exam, he made that mental leap only the ingenious are capable of. He had been guessing, essentially, at the proper audio level for loading, a blind insertion as it were. If the level could be gauged by a meter, Krogh reckoned, then some serious work with his Apple could begin.

From Depths of Mind and Closet. A household improvisation commenced. From a menagerie of gear, he extracted fifteen wires, cables, clip leads, a speaker, and an aging VOM. A loose ensemble materialized with Krogh's orchestration. The only item holding it all in place was Scotch tape. "If I made one false move," Krogh recalls now, "the wires split and I was forced to retrace each individual wire to its origin." He looks at the uncluttered corner where the knotty assemblage once lay. "It was hokey," he mutters.

For all that, it worked. Reading off his operating VOM, Krogh could load previously troublesome cassettes in a matter of minutes with relative ease.

The ERR signals had vanished.

And to make it sweeter, almost six hundred dollars had been saved.

Polishing the Apple. The invention virtually realized, streamlining was clearly in order. "I couldn't operate with such a tangle and my wife Dorothy . . . to say that my wife gasped at the sight would be an understatement." In a week's time, Krogh reduced his snarly traffic jam of cable down to a small box the length and width of a calculator. And he made another.

He gave both to Computer Components of Burbank, his local retailer: one to demonstrate and one to sell at about forty-five dollars. The newly dubbed Cassette Master sold immediately, and Computer Component's demonstrations created a demand no one could ignore, least of all Krogh.

Industry Beckons. "An excitement took hold," Krogh explains. "Dave Gordon, the president of Programma, walked into the store one day when I was there discussing the future of Cassette Master with the owners. After he saw how it worked, he looked at it for a moment, looked at me, and said, 'When you have a thousand of them made, let me know.' "

With this reassuring encouragement, Krogh went to work. Because he had given his only Master to the store, he needed to

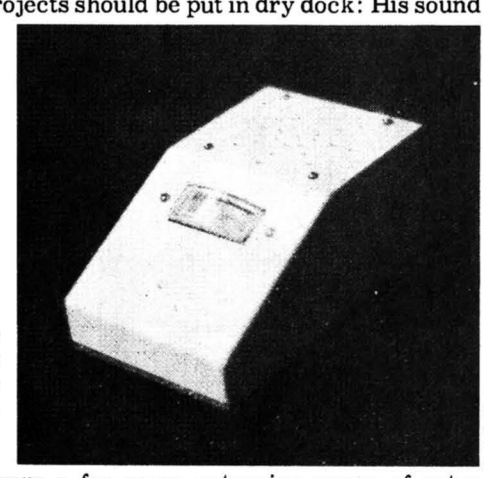
borrow the buyer's Master as a model. "In two or three days' time, the owner was screaming to have it back. He just couldn't live without it. Well, at least, his Apple couldn't." Krogh shudders, though, when recalling the labor demanded to hand-drill the casing for assembly. "That kind of handwork deceives you—it's painstakingly difficult. Ten of those casings was the limit." Cassette Master became a limited edition, which, logically, created a greater demand.

The Immovable Mountain. Frank Krogh had cracked every technical nut up to now, but a snarl of wire proved inconsequential compared to the tangle of manufacturing and business demands his invention had spawned, the organization, time, and energy—items Krogh has precious little of while he remains employed at NBC.

"It was an adventure, but business was always a mystery to me. The obstacles of putting the Master on the market were too much after a while. The production and marketing costs I estimated to be in the thousands of dollars. Dorothy and I didn't want to spend that much personally for a toy." He would need a patron to back his project of a thousand. Dave Gordon's remark was not lost on Krogh, but to this day the mass availability of Cassette Master remains an elusive dream.

Help Wanted. What keeps it alive is a realization that there must be others in Frank Krogh's very position: solvent enough to own an Apple alone, but not quite able to handle the considerable additional expense of a disk drive. But the inventor is the first to acknowledge Cassette Master's drawbacks. "It can be time-consuming, what with the three minutes plus it takes to load. You have to be careful about the sound level so as not to load down the signal. And you can only have one program at a time on cassette . . . there's no quick switching back and forth." But the fractional cost of the Master seems to offset these difficulties, as the Computer Components experience suggests.

If and when the patronage emerges, Krogh won't know which of his other projects should be put in dry dock: His sound



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Cassette Master looks a lot like a joystick—and to cassette-only computer owners, it is.

light board that covers a far more extensive range of notes than the typical three-tone variety? His paintings of landscapes and nature filled with striking primary colors? His programming of a game he is very excited about? Or perhaps his custom necklace jewelry work?

Renaissance Man. "Jewelry was my first hobby. Oddly enough, it didn't cost me an arm and a leg to get started like some of the projects I later became involved in. Still, there are risks, like crazy gold prices." By their very nature, eclectic minds aren't driven away by such risks, and Frank Krogh is an eclectic.

He smiles at the mention of the word. "I know that it's in me. Some may call it dabbling. But I think involvement in different ideas, projects, hobbies—that is the sign of an active life. Best of all, Dorothy doesn't seem to mind . . . most of the time. If it weren't for her, I wouldn't have an Apple. She tolerates my crazier notions; I owe her a lot."

For diskless Apple owners though, Krogh's notion of a better mousetrap for tape insertion will not be crazy in the least—if they ever have a chance to use it. ■

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MARKETALK

News

☐ Don Martin of **Cine-Aero Productions** (Burbank, CA) has developed a *Bar and Wine Guide* for the Apple. The wine guide helps in selecting fine wines to accompany any meal—more than one hundred combinations—or occasion. The bar guide gives recipes for thirty mixed drinks. Program also helps out with a glossary of terms and a wine pronunciation guide. Requires 48K Applesoft; available on disk at $24.95 and on cassette at $19.95.

☐ **The Micro Works** (Del Mar, CA) offers the *DS-65 Digisector*, a random video access digitizer in super-hi-res with sixty-four levels of gray. It accepts NTSC or industrial input. Digitizer can be used for security systems, program picture digitizing, moving target indicators, computer portraiture, strip charts, bar codes. Basic programs include smart burglar alarm and graph reader. Currently used in medical research for slide analysis. For fun, can "learn" people by name. DS-65 retails for $349.95; combined price for DS-65 and *Advanced Video FSII Camera* is $599.00.

☐ **Howard Industries** (Anaheim, CA) announces *Typrinter 221*, a letter-quality, daisy-wheel printer with five built-in microprocessors. Offers text formatting including right justification and proportional spacing, tabbing, underlining; will print boldface, will center text or titles, and will print in reverse (white on black); can respond to text-imbedded formatting commands. Allows three type sizes, twenty fonts. $2750.00.

☐ **Micro Dynamics** (Los Angeles, CA) presents the *CM13L Color Monitor* for the Apple. Resolution is 260 TV lines horizontally, 300 TV lines vertically on 13-inch screen. Text displayed is 25 rows of 40 characters on 8x8 dot matrix. User controls contrast, tint, color, vertical hold, and volume (where applicable). Big news is cost: $449.

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☐ *Personal Computers Serving People,* by Robert A. Lavine, is the new offering from **Hawkins and Associates,** publishers (Washington, DC). An introductory guide to personal computers, book tells how to use micro in educating children and self, in helping people with handicaps, in using graphic arts, and in recreation. Introduces hardware and software in step-by-step, jargonfree presentation. Brief programs illustrate applications. Includes introduction to programming as well as a guide to products, books, and magazines in personal computer field. Paperback, 150 pages. $7.95.

☐ **TYC Software** (Genesco, NY) offers the *Individual Study Center.* The program comprises six forms of study; five use game-type formats for study and one uses drills and test formats for review or direct learning. A seventh program, the Maintenance Program, allows user to make own subject data tapes. Available subject data tapes from TYC include French, Spanish, and German; English grammar; vocabulary builders and parts of speech; mathematics; American history; the two world wars; general biology and human systems; spelling; geography; and special interests. All data tapes can be used with all six forms of study in the Study Center. System requires 16K Apple, Applesoft in ROM, and cassette player. Data cassettes include at least eighty questions and answers each and are $4.95 each; Individual Study Center package includes two cassettes for main program, sample subject data tape, blank cassette, user's manual and teaching guide, and white vinyl binder. $39.95.

☐ Still on the subject of education, **Apple*cations** (Southfield, MI) has developed *Study Quiz Files* and *Multiple Choice Files,* host programs that allow user to create lessons in quiz forms. According to the company, a teacher can place an entire course on disk, gearing it to a text. Apple*cations also offers *Schoolhouse Five,* a series of six (yes, not five) educational programs for the primary grades. Programs are "Spelling Words," "Hangman," "Word Fun," "Adding Columns," "Fraction Problems," and "Division with R" (remainder instead of decimals). Programs require 32K Apple with Applesoft and disk drive. *Study Quiz Files* and *Multiple Choice Files* are $18.95 each; *Schoolhouse Five* is $14.95.

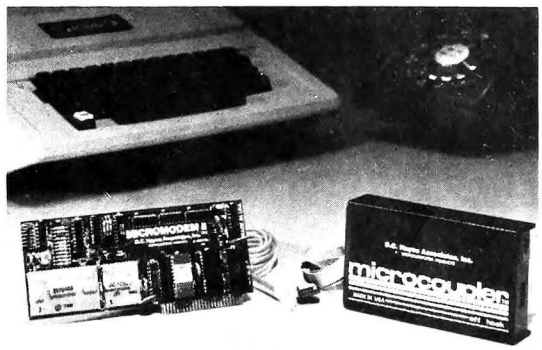
☐ **Strategic Simulations** (Palo Alto, CA), who introduced *Computer Quarterback* last month (see September *Softalk,* Marketalk Reviews), is not a company to let the grass grow under your feet. Back in the war game tradition is their latest offering, *Computer Napoleonics: The Battle of Waterloo.* Intended to be useful as an introduction to computer wargaming, *Computer Napoleonics* nevertheless packs a challenge for the veteran wargamer as well. Two players or individual versus computer have twenty-five units each; British player gets Prussian reinforcements. Each turn represents one hour of real time and consists of three phases for each side: movement, combat setup, combat execution. Each side has infantry, cavalry, various other units to manipulate. The most like typical board war games of all Strategic's offerings, according to company exec. Full game takes about three hours to play. Hi-res color mapboard. 48K Applesoft, disk required. $59.95.

☐ Pushbutton operation and user-changeable combination are the unique qualities of *Code-a-Sentry,* a new computer-room security lock by **Inmac** (International Minicomputer Accessories Corp., Santa Clara, CA). Fifteen minute installation on doors 1¾ inches to 2⅛ inches thick with either wood or metal jambs. Lock is rated by experts as pickproof, according to manufacturer. As on all Inmac products, Ship Sure service plan guarantees delivery within twenty-four hours of order. $195.00. ■

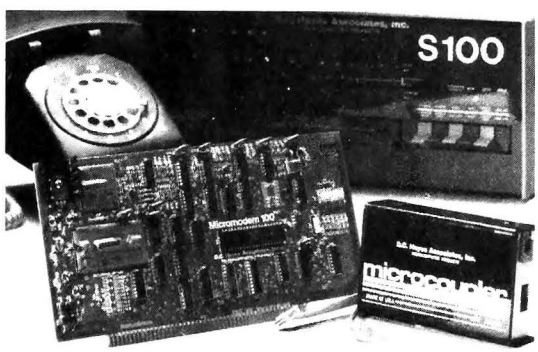
WE'D LIKE TO SHARE A FEW WORDS WITH YOU...

modem / mō′ dəm / n: A device for transmission of digital information via an analog channel such as a telephone circuit.

Micromodem II* / mī′ krō•mō′ dəm tü /*trademark* — a complete data communications system for the Apple II** Personal Computer, combining functions which formerly required a modem, an automatic calling unit, and serial and parallel interfaces. Onboard ROM firmware provides for remote console, terminal mode, and simplified implementation of more sophisticated applications with BASIC programs. The Micromodem II comes with the FCC registered Microcoupler, operates at 110 or 300 baud (Bell 103 compatible), and can automatically dial or answer the phone and transfer data.



Micromodem 100* / mī′ krō•mō′ dəm wun hun′ drəd / *trademark* — a complete data communications system for S-100 microcomputers, providing all the capabilities of a serial interface card and an acoustic coupler, with the addition of programmable automatic dialing and answer. The Micromodem 100 comes with the Microcoupler and is fully S-100 bus compatible including 16-bit machines and 4 MHz processors. The Micromodem 100 operates at either of two software selectable baud rates — 300 baud and a jumper selectable speed from 45 to 300 baud.



acoustic coupler / ə•küs′ tik kup′ lər / n: A modem that works through the standard telephone handset, transmitting data through the regular earphone and microphone. It can be affected by room noise and suffers from the distortion inherent in the carbon microphone.

Microcoupler* / mī′ krō•kup′ lər / *trademark* — an FCC registered device that provides direct access to the telephone system without the losses or distortions associated with acoustic couplers and without a telephone company supplied data access arrangement.

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* **Micromodem II, Micromodem 100,** and **Microcoupler** are trademarks of D.C. Hayes Associates, Inc.
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Within the booming microcomputer industry, that portion of the market served by Apple Computer is growing fastest of all. Apple ownership calls forth the enthusiastic brand loyalty once only associated with a particular make of automobile.

Apple ownership has opened new vistas both personally and in business. Already Softalk *has enumerated some of these new applications, from the implementing of tasks in entertainment industry to helping the handicapped. Hundreds of others have come to our attention and the flow of news continues. These are the grist of future issues.*

Almost all these applications depend on software and peripherals developed outside Apple Computer Inc. by other companies. Professionals use VisiCalc *at their desks, the blind can use SuperTalkers to communicate, and retail stores can use BarWands at their checkout counters.*

But concomitant with the explosion of products to support the Apple has come an acquisitiveness on the part of many users that threatens the future health of the industry. These owners either become, or trade with, software pirates. What they fail to realize is that the money they save costs the rest of us dearly. MCT ART

The pirates of today sail no ships, fly no flags, and don't engage in swordplay or murder; but plunder they do. Their thievery is still theft; but their booty is not diamonds and doubloons, it's plastic—in the form of floppy disks and cassette tapes loaded with popular computer programs.

To those who buy their goods, software pirates are great money savers; to their victims in the industry, they're thieves.

Just One for My Buddy. Starting by making copies for enthusiastic friends, some personal computer users move on to cranking out tens to hundreds of copies that they nonchalantly pass on to their friends' friends and mere acquaintances. Where scruples draw a line and a halt varies; but few who have gone this far can resist the opportunity to profit from their work, and they begin to offer "their" product for sale.

Revenues gained by the pirate are a minute fraction of revenues lost by the creators and manufacturers of the products. The price the duplicator charges, if any, is often just enough to cover expenses—the cost of the blank disk used for copying. The price a manufacturer charges also covers expenses—supplies; special equipment; expert personnel to test, improve, and retest; a business staff; the overhead cost of providing a working environment; and hundreds of hours of exacting mental labors, whether performed by staff programmers or by individuals to whom the company pays royalties.

Higher Prices, Fewer Producers. Although obtaining pi-

Pirate, Thief. Who D

rated software may save a user hundreds of dollars immediately, the long-range losses far outweigh the initial gains. Mel Norell of Programma International claims that as pirating grows, the price of software will rise; as this happens, some companies will find it unprofitable to operate, particularly those that specialize in lower priced packages; these companies will fold and there will be less software available.

Norell's solution to the problem is hardware in the form of a chip or board to be inserted when one wishes to run a particular program. Naturally, the user will bear the brunt of this cost, as well as the inconvenience.

Prices do not necessarily have to rise for the user to be affected. According to Ken Williams of On-Line Systems in Coarsegold, California, "The most adverse effect of piracy is not so much the higher price of software as it is the lower quality of new programs."

If their programs are pirated, companies like On-Line Systems and Personal Software will no longer be able to spend months and dollars perfecting and protecting their products. "Instead, the industry will revert to the weekend programmer who operates out of his garage and come out with more pong-type games."

Holding Back and Holding Out. Ken Williams's prediction is that rampant piracy will force software makers—those that manage to stay in business—to withhold new developments and products until they can be guaranteed returns for their work.

That prediction is already a reality. Neil Lipson, president of Progressive Software, says his company would have folded last winter as a direct result of piracy, were it not for the Lipson light pen, a hardware product. "Now we have several new products—really good programs—ready to market. But we're afraid to come out with them because of what might—no, because of what we know—will happen."

Software Publishers Hear Appealing Decision

Besides making waves in the marketplace, pirates have brought the software industry face to face with a new copyright conundrum. In September 1979, Data Cash Systems, Inc., brought suit against JS&A Group, Inc. The plaintiffs, Data Cash, charged that the read only memory (ROM) of their computer chess game was copied by JS&A and was marketed as the defendants' own; Data Cash contended that this violated and was an infringement of copyright law.

The district court ruled in favor of JS&A, holding that the ROM was not a "copy" of the program, and therefore that the copying of it was legitimate. Data Cash immediately filed a notice of appeal claiming that the court erred in its decision.

Data Cash's attorney, Geraldine Brown, asserted that "copyright protection for the program in humanly readable [flow chart] form is of no value if the machine readable copies, those embodied in ROMs, can be pirated with impunity."

In May of this year, Data Cash filed its appeal, which claimed that the court had erred in its decision that the ROM is not a "copy" as defined in the copyright law. And, on September 2, the court of appeals issued its opinion.

The court did not discuss the conclusion that the ROM is not a "copy" protected by copyright laws. Rather, it affirmed the decision on the alternative ground that the program contained in the ROM had entered the public domain because it was without copyright notice.

Though the subject of copyrightability was avoided explicitly, the clear implication is that ROMs are indeed considered by the court to be legitimate objects for copyright protection. The issued opinion clearly states that "a notice [of copyright] on the game board or the printed instructions would have presented no difficulty."

So it seems that, although Data Cash lost its battle, it has elicited a precedent through which the software industry may well win the war. ■

res to Catch Him?

BY MATTHEW YUEN

Some developers are trying to keep pirates from duplicating their programs by having the programs automatically destroy themselves if a copy or listing is attempted; but Don Williams, formerly of Desktop Computers, considers this a disservice to the user. To allow the user to fix bugs or enhance the system, he believes in leaving the source code unprotected.

Currently, Desktop, along with several other companies from Softagon in New Jersey to Edu-ware in California, puts out unprotected software. This may seem like an open invitation to piracy, no penalties risked, but Don Williams suggests that pirates simply fail to see the planks they're walking. "For real expansion in computer usage to be achieved, low cost and reliable software is needed. That's only going to be achieved when developers can be assured that they'll be paid for their efforts."

User Groups Under Fire. Many manufacturers and retailers believe that user groups, at least those computer clubs whose members meet to swap information and programs with each other, are the most common perpetrators of unlawful copying.

When microcomputers were first introduced to the home,

few were able to use them with a great deal of efficiency. Because information and help were scarce, the best way for owners to learn more about their new investments was to meet and share ideas with other owners. As computers gained popularity, user groups expanded in size and proliferated. Exchanging information and homemade programs was fine; the problems arose when group members began trading commercial software as freely as they did their own.

Today, these clubs cover the gamut from those whose members exchange secrets of the trade to ones whose leaders pass out heavily demanded programs free or for a nominal fee.

Not all user groups are bootleggers. The International Apple Core, the parent organization for Apple user groups throughout the world, has strong feelings against piracy, but finds them difficult to enforce. "We don't encourage it, nor do we condone it," says Ken Silverman, president of the organization. "We do distribute copied software, but it is noncopyrighted, usually donated by one of our members.

"Naturally, if a member club is passing around bootlegged programs, we can't really do anything about it. How could we know? Even if we did, there's no way to stop them; we simply lay down our policies and ask for cooperation."

In fact, the IAC does attempt to enforce its policies, at least with clubs wishing to join its ranks. It will not accept a club that it suspects of distributing pirated software.

Honest Clubs Suffer the Heat. Progressive Software topper Neil Lipson also holds the post of president of the Philadelphia Apple Club, another honest user group; Lipson ensures that. Lipson is convinced that pirating user groups are in the minority, but that those who are involved in illegal copying and trading are rife in it. A few individuals within a group can give the whole club, and even user groups in general, a bad reputation.

Coexisting with groups like the IAC are those that have no animosity toward piracy. The common practice in these groups is for each member to purchase a different program and make copies to give to or trade with fellow members.

One group that engaged in such practices until recently is the Miami Apple User's Group (MAUG). MAUG was founded by less than a dozen computer owners meeting at Southern Microcomputer, a retail store. According to Jim Wright, the store's manager, members would trade commercial as well as private programs. Eventually, the club grew much larger, and commercial software was merely handed out. Steve Pierce, the club's president, believes there to be a clear distinction between this practice and that of other "pirate" groups:

"What our group was doing did not involve members selling software; rather, all the members paid dues and received library packs. We charged five to eight dollars per disk; the software itself was free." Thus, a two-hundred-dollar program on a single disk would cost the member the same amount as a twenty-dollar game on a single disk, and the price to members in each case was little or no more than the cost of the disk housing the pirated program.

A New Leaf. At the Fifth West Coast Computer Faire in March 1980, Pierce met Silverman, then secretary of the IAC, and decided MAUG should join the parent group. But the IAC believed MAUG's practices unethical. "I told them we would stop doing it [distributing copied commercial software] if the IAC would let us into the stream of information being exchanged," Pierce explains.

However, changing practices was not that simple. According to Wright, friction arose between Pierce and some of the group's members when Pierce returned from San Francisco with his new philosophies regarding the copying and distributing of copyrighted software.

"At first, a lot of the members were upset because they felt Steve was being hypocritical," says Wright. "Here's a man who has the largest software collection in the group, possibly one of the largest in the country, and now he's saying that the club is going to change its ways. Naturally they were upset." But Pierce held his ground; the other board members did likewise; and now MAUG is part of the IAC.

Individual users and their organizations are not the only suspected culprits; software piracy also occurs in retail stores.

Piracy in the Retail Ranks. Although the vast majority of retailers depend on software sales as much as computer sales to make their nut and would easily see the long-range consequences of ripping off their suppliers as disastrous, a few do not, and these few cause painful times for manufacturers.

Some dealers won't order a new product; they won't risk money on products they have to buy sight unseen, especially when, as is the policy of most software companies, they have no recourse if they cannot sell what they purchase.

Instead, several retailers chip in and purchase one original from which they make copies for themselves. The dealers who like the product after running their copies may decide to place orders. But some dealers, even when they consider a program a winner, still won't purchase any for their stores. What they might do is make and sell copies of their copies.

Lipson of Progressive thinks retailers are the major perpetrators of software piracy. He refers to several retailers who never fail to order one copy of any new software product he produces. But none of them ever reorders a program. "A customer on the brink of buying a system says he'll buy it if he can have this or that program with it. Naturally, the retailer agrees, and the computer sale is made. But instead of taking financial responsibility for the plum and throwing in the program at his own expense, the retailer makes the customer a copy and retains the original."

The Noneffect of Doing Nothing. Jim Collins of 0B2, a large computer and software distributer in Newport Beach, California, has been able to trace down roughly five thousand dollars' worth of this type of illegitimate software. Yet, despite the giant losses to manufacturers implied by projecting these figures nationwide, Collins lets the perpetrators off with a mild warning to stop. And he is not out of the mainstream in his lack of action.

Software developers have been and are being cheated and stolen from by both users and retailers, yet they have hesitated to take action. The consensus of the industry seems to have been that taking legal action wouldn't be worth the money.

Regarding bootlegging by retailers, Collins offers this explanation: "No one wants to use legal channels because the industry is so new that there is really no reason to step on anyone's toes. Software manufacturers prefer to take the easiest route possible." If theft is not a reason to "step on anyone's [presumably the thief's] toes," one wonders what would be.

Mel Norell believes there just isn't anything software companies can do. "Sanctions against pirates consist mainly of threats to sue. The maker of the program will tell the pirate to stop, and he supposedly complies. After that, there is really no way to know whether it [the piracy] is still going on." Norell estimates that two or three illegitimate copies exist for every one he sells.

"Legal remedies are just too costly to pursue," Jim Powers of Powersoft in New Jersey points out. "We got a complaint about one of our programs, and it turned out to be a pi-

rated copy. When we tried to contact the retailer who sold it, he refused to return our calls." His company could not afford the expensive procedures necessary to follow this up.

Sergeant Chris Charvez of the Santa Clara Sheriff Department's organized crime unit offers an explanation from observation: "First, the industry is concerned with how much it profits, not so much with what it loses. Secondly, the industry doesn't want bad publicity. The company looks at what is being pirated, its value to them and to the industry as a whole, and asks: 'Is the time spent, the money involved, and the bad publicity that will result worth the prosecution of someone who has already duplicated the program?' "

The answer to this question used to be no. Now, the general feeling is that software producers have remained silent on the matter of piracy long enough and that it is high time they spoke out and did something about it. And heavier protection is not a panacea.

Addressing the Question. Recently, several companies have begun investigating the possibilities for taking legal action to stop piracy.

Southwestern Data Systems, Softape, and Programma International are three companies that have been hit hard by piracy and are willing to fight back.

Macrotronics, producers of a ham radio transcriber for the Apple and of the software to go with it, include in their packaging a notice of reward for anyone leading them to people engaging in the pirating of their software—or hardware.

Personal Software, in a recently released formal statement by Ed Ebsner, vice-president of marketing, concerning illegal copies of their software, says that it will "pursue all legal remedies available to pursue anyone who infringes our copyrights or otherwise pirates our products."

On to the Courts. As other companies take heart from these leaders and become willing to stand up for their rights, the industry can be expected to settle for nothing less than criminal prosecution.

Like the business it ruins, software piracy is very young, and it can be stopped. New, clearer interpretations of the copyright laws appear to be fast coming, but neither they nor the old law can be effective unless they are called on, tested, and seasoned by use.

Not every perpetrator of any crime can be captured by the law. Most software pirates are not criminals at heart; they operate by blanking out the reality of what they are doing, by focusing on the people for whom it seems they are doing a service and never focusing on those whose sweat created the objects of their generosity.

In the Wake of the Software Pirate. These people alone have the ability to stop piracy directly. They must come to realize that software manufacturers are neither the biggest nor the sole losers; that, in weakening the industry, bootleggers—and purchasers of illegitimate software—are ultimately hurting themselves.

Because if they are caught—and the chances are better every day that they will be—they will have to face the cold reality of what they are really doing; stealing and selling stolen goods.

And if they aren't caught, they face a different fate: the loss of the market they plunder. For rampant piracy will destroy its victims just as surely as the ocean pirates slew theirs; and then there will be no products to pirate.

■

The seriousness of the piracy problem is reduced to numbers in the adjacent column. In light of the legal implications of the appellate court's decision in the Data Cash case, Softalk *is presently exploring with its attorneys, and with software publishers, the advisability of offering a reward for information leading to the arrest and conviction of anyone guilty of copyright infringement of any proprietary software written to run on the Apple Computer. An article in a future issue will detail* Softalk*'s involvement in combatting piracy.*

The Staggering Value of Pirate's Booty

Piracy, organized and individual, costs the microcomputer industry more than twice the value of the software bootlegged.

A *Softalk* survey indicates that the average Apple owner possesses in excess of one hundred dollars' worth of pirated software in his library.

Compound that figure by ten thousand new Apple owners each month and you arrive at a sum of $1,000,000 being siphoned out of the software industry monthly, and that counts only software designed for Apples.

Even that shocking amount does not tell the full story. In a young industry, such as the microcomputer industry, it is customary for companies to reinvest all, or almost all, of their profits in their businesses as they individually strive for preeminence in the field.

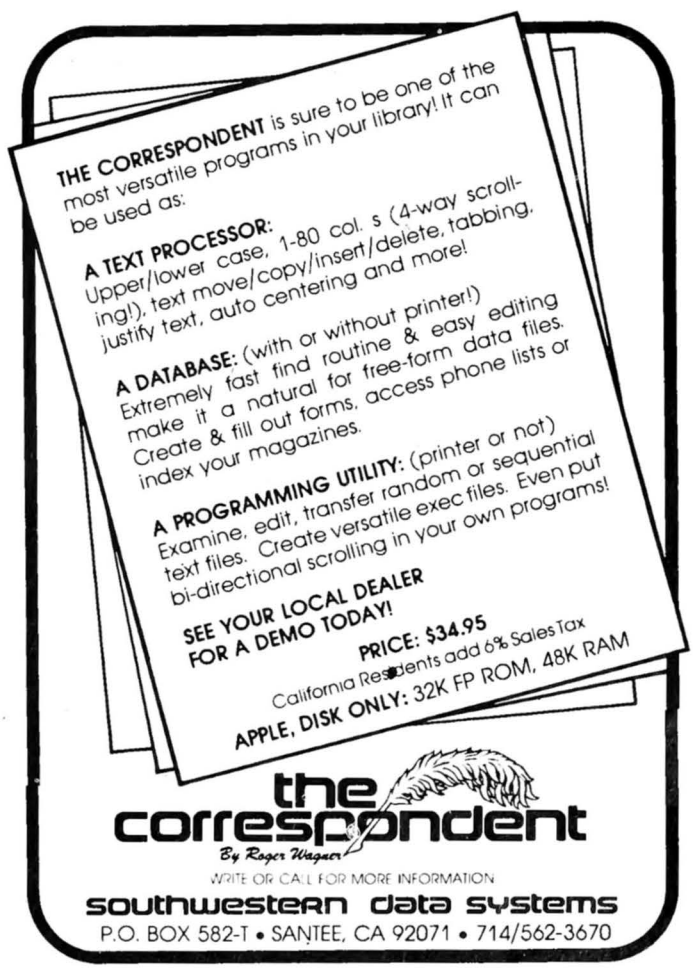
If one can make that same assumption about the pirated $1,000,000, the loss per month becomes much greater.

The flow-through theory of money postulates that each dollar spent within a relatively closed community, such as the software industry represents, will actually infuse that community's economy with $2.50 in the purchase of goods and services before it is exhausted.

Using that theory, the loss to the software industry from piracy is actually closer to $2,500,000 per month—$1,000,000 in actual losses and $1,500,000 in lost opportunity.

Until pirating activities can be successfully combatted, losses of that magnitude represent a substantial drag not only on the developers of software but on the developers of hardware and peripherals as well.

ART



THE LOGICAL WAY

BY WILLIAM DEPEW

Friends in High (Level) Places

In this decade, the computer will proliferate throughout our society. The microcomputer revolution, spawned in the early seventies, is now escalating beyond the barriers of industry, enticing the public at large with the magic of its power and application.

Magic seems an appropriate word to describe the experiences of many new members of the computer society. In computer stores, they witness countless feats of prestidigitalation. Intoxicated by dreams of what this miracle machine can do for them, they purchase the hardware. At home, they reach into the hat and make a sobering discovery: they are not magicians. For a price they can buy many tricks, but their dreams remain dreams.

Magic is an acquired skill, and the road to mastering any skill is paved with education and practice. The complexity of computer systems is staggering, requiring many years of education to understand fully how they function. At the low level, the 6502 machine level, playing with pi is no piece of cake.

Fortunately, industry and educational institutions have developed equally sophisticated software tools that circumvent the need for total understanding—premade setups that permit nonmagicians to perform magic, so to speak. These aids are called high-level languages. They place the user on a foundation of professionally written and optimized code. Without these friends on our side, just talking to the machine would be difficult.

There are many high-level aids, going by names like Basic (Beginner's All-purpose Symbolic Instruction Code), Fortran (FORmula TRANslation), and Cobol (COmmon [English] Business Oriented Language). The scope, or realm of application, is often implied by the names of the languages. Fortran was designed for engineers and scientists, Cobol for business information processing, and Basic as a general purpose compromise between Fortran and Cobol. The simple, Englishlike statements and wide scope of Basic have made it the most popular language available on microcomputers.

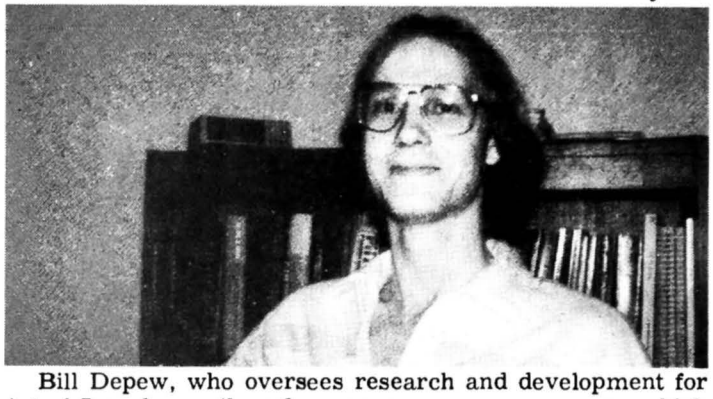
Although these high-level program development aids reduce the amount of effort required to realize an application, it still remains the programmer's job to state the problem concisely within the vocabulary of the language in use. And, as with spoken languages, it is generally the case with computer languages that words in different languages may look and sound unique but often have very similar meanings. Once you have mastered one language, you will quickly find parallels in a new language you study. You will also find that the methods you have learned will generally apply to any language you may use.

This month, Logical Way will discuss the structure of one high-level language with the intent of developing insight about how problems are defined within this structure. Because Basic is the most popular language, Applesoft Basic will be the subject.

The solving of any problem requires information and action. In Basic and other languages, information is represented as *expressions* of data. Expressions can be very complex or very simple structures. An expression can be defined as a sequence of language components that reduce to, or represent, a *value* of some *data type*.

Actions to be taken are described by *statements* of action. A statement is similar to an imperative sentence in the English language. It contains a predicate describing the action to be taken and an object that is acted upon. The components that cause action are often referred to as *verbs* because of the parallel to predicates in spoken language.

Likewise, the components of programming languages are called *words*. Words that have a predefined and unalterable meaning are termed *reserved words*. Reserved words form the base vocabulary of the language and include *operators, functions, procedures,* and *data types*. Words may be coined by the user to represent information. These words are called *constants* and *variables,* indicating their static or dynamic nature. They are defined as representing one of the predefined types of data. Some languages allow the user to define words representing action. These verbs are called user-defined *functions* and *procedures*. Every language has rules of grammar, or *syntax,* that dictate how these words may be combined into statements.



Bill Depew, who oversees research and development for Artsci Inc., has authored numerous programs, among which are *Apple-21, The Screen Machine*, and, with Gary Shannon, *Magic Window*. After a year in the computer science department at UCLA, he toured nationwide with a rock band for the next three. Leaving the musical life behind, Bill cofounded Softape in 1978.

To solve a problem, we need to identify it. This fundamental step is called *problem definition.* Normally, a problem is defined in English. Figure 1 shows this kind of definition. Given such a problem to solve on paper, we intuitively know the sequence of steps to be taken to solve it, based on our understanding of the vocabulary used.

Sum the numbers from 1 to 10 and tell me the result.

Figure 1. Problem definition.

The programmer's job is to translate, or abstract, the definition into statements of words belonging to the vocabulary of the computer language in use. With a good understanding of the computer language vocabulary, this problem can be restated intuitively by the programmer.

Intuition alone falters and becomes error-prone as the complexity of the problem increases. A systematic method for restating a problem exists, and it works on problems of any complexity. This method is called *stepwise refinement.* As its name implies, the method involves refining, or restating, the problem step by step. The end result is a sequence of statements that the computer can understand and use to solve the problem.

The first step should be to *partition,* or separate, the problem into groups of smaller problems. Words that are not es-

sential to its meaning are removed from the definition. Figure 2 illustrates this. The problem has been partitioned into two statements. The first has the verb *sum,* which acts on the expression *numbers from 1 to 10.* In the second statement, the action is *tell* and the expression is *result.* The definition is still comprised of common words.

```
1 Sum numbers from 1 to 10
2 Tell result
```

Figure 2. Partitioning.

The next step is to replace the English words with computer language words that have identical meanings. In the statement *tell result,* this is straightforward. The verb *tell,* or communicate to, has a direct equivalent in the Basic word *PRINT. Result* is a user-defined variable that represents the value obtained in the first statement.

In regard to the first statement, there are no direct equivalents for the verb *sum* or for the expression *numbers from 1 to 10.* This statement requires further refinement before it can be directly translated into the words of the computer language. To sum a set of numbers, we add each member of the set to a subtotal and repeat the process until all members of the set have been added. If the result is to be correct, the subtotal must be cleared to zero before we start. The set of numbers to be added is described by the expression *numbers from 1 to 10.* This expression implies the ordered set of all whole numbers greater or equal to one and less than or equal to ten. This set of numbers can be generated by counting (by ones), and the process *sum* can be realized by adding each number to the subtotal as we count. When we count up to a number that is larger than the largest member of the set, the process is terminated.

A subprogram or procedure has been defined to perform the summing operation. It requires another variable called *number* to represent the count value. The next step is to replace the first statement in figure 2 with this procedure. Figure 3 shows the refinement of the definition.

```
1 Set RESULT to zero
2 Set NUMBER to one
3 Add NUMBER to RESULT
4 Add one to NUMBER
5 If NUMBER is less than or equal to ten, repeat steps 3 and 4
6 PRINT RESULT
```

Figure 3. Refinement.

Now the definition may be directly translated into Basic. This translation, listed in figure 4, is a working definition that Basic can use to solve the problem.

```
1 RESULT = 0
2 NUMBER = 1
3 RESULT = RESULT + NUMBER
4 NUMBER = NUMBER + 1
5 IF NUMBER <= 10 THEN 3
6 PRINT RESULT
```

Figure 4. Translation.

The need to repeat a process conditionally is so common that all high-level languages provide a structure for this purpose. In Basic, the reserved words *FOR* and *NEXT* are used to build a construct, or structure, that will repeat a process a specified number of times.

The word *FOR* marks the beginning of the process to be repeated. It requires the name of the variable that represents the count, the first and last members of the set of values to be counted, and a value to be added to the count before the process is repeated. The word *NEXT* marks the end of the process and adds the count value to the count variable. If the count variable is within the domain specified in the FOR statement, the process is repeated. Figure 5 shows a translation of the definition using the FOR . . . NEXT construct.

```
1 RESULT = 0
2 FOR NUMBER = 1 TO 10 STEP 1
3 RESULT = RESULT + NUMBER
4 NEXT NUMBER
5 PRINT RESULT
```

Figure 5. Further translation.

GOTO 28

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Assembly Lines

from page 4

The hex number $FF (255) is the largest value a single byte can hold. A block of 256 bytes (for instance $0 to $FF) is often called a *page* of memory. In figure 2, all the addresses from $0 to $FF are shown in block *b*. Four of these blocks together, as in *c*, make up 1K of memory. As you can see, there are actually 1,024 bytes in 1K. Thus a 48K machine actually has 49,050 bytes of RAM.

Block *d* of figure 2 shows the Apple's entire range again. If you do not have a full 48K of memory, then the missing range will just appear to hold a constant value (usually $FF), and you will not be able to store any particular value there.

The range from $C000 to $FFFF is all reserved for hardware. This means that any data stored in this range is of a permanent nature and cannot be altered by the user. Some areas are actually a physical connection to things like the speaker or game switches. Others, like $E000 to $FFFF are filled in by the chips in the machine called ROMs.

ROM stands for *r*ead *o*nly *m*emory. These chips hold the machine language routines that make up either Applesoft or Integer, depending on whether you have an Apple Plus or the standard model. One of them is also the monitor, which is what initializes the Apple when it is first turned on so you can talk to it, and also handles your input when you're at the monitor level.

Now that break message should have at least a little meaning.

```
8BF2- A=03 X=9D Y=00 P=36 S=F2
```

The *8BF2* is an address in memory. Rather like a "catch-22," it says that the break actually occurred at the address given minus two (8BF2 − 2 = 8BF0). For reasons that aren't worth going into here, the monitor always prints out a break address in this plus-two fashion.

What about the rest of the message? Consider the next three items:

```
A=03 X=9D Y=00
```

The 6502, in addition to being able to address the various memory locations in the Apple, has a number of internal *registers*. These are units inside the 6502 itself that can store a given number value, and they are individually addressable in much the same way memory is. The difference is that instead of being given a hexadecimal address, they are called the x-register, the y-register, and the accumulator. In our error message, we are being told the status of these three registers at the break.

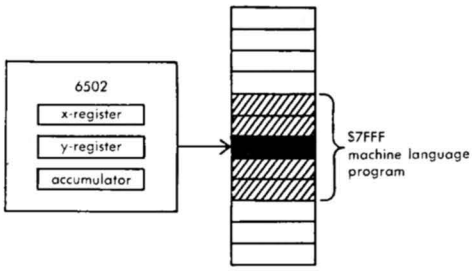

Figure 3.

Figure 3 summarizes what we know so far. The 6502 is a microprocessor chip that has the ability to scan through a given range of memory, which we will generally specify by using hex notation for the addresses. Depending on the values it finds in each location as it scans through, it will perform various operations. As an additional feature to its operation, it has a number of internal registers, namely the x and y registers, and the accumulator. Memory-related operations are best done by entering the monitor level of the Apple (usually with a CALL−151 or RESET) and using the various routines available to us.

Next issue, we'll look at what an assembler actually does, and specifically how to use the Apple's mini-assembler. This assembler is present in any standard Apple with Integer Basic, or in an Apple II Plus with the Integer Basic firmware card. If you don't have either of these, I recommend getting one of the many assembler software packages available. If you're on a limited budget, there is a free one in many user group libraries called by a variety of names including *Randy's Weekend Assembler, Ted II,* and *Assembler 3.2.* Get in touch with the librarian for your local group if you don't already have a copy. Otherwise, see your local computer store and get their advice on a good assembler. There are many opinions and I won't go into a review here.

In the meantime, you might also look at page 49 in the most recent Apple II Reference Manual. It has an excellent discussion of the monitor commands and also of the mini-assembler.

Meet you here next issue! ◨

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MARKETALK

Reviews

Growing Pains: Last month this column offered an enthusiastic review of a new football game by Dan Bunten of Strategic Simulations, creators also of *Computer Bismarck* and *Computer Ambush.* Reviewing from a prerelease unpackaged disk, we referred to the game as "Real-Time Football," which indeed it is, but *not* by title. The correct name of the game is, logically, *Computer Quarterback.*

Odyssey: The Compleat Apventure. If you're familiar with Synergistic Software's *Wilderness Campaign,* then you'll recognize the refreshing touch of Bob Clardy in the new *Odyssey* game from the same company. As its name suggests, *Odyssey* carries its fantasy adventurer far beyond one place and one setting. When you've conquered all the obstacles on the original island "somewhere in the Sargalo Sea," a task similar to but more difficult than that of *Wilderness Campaign,* you've merely earned the right to begin your odyssey.

The object of *Odyssey* is to save a realm from an evil ruler. You must accomplish this by locating and retrieving the golden orb lost by the ousted benevolent leader, returning the orb to the castle, and taking over the kingdom.

Adventures on the original island involve your attempts to gather gold to buy equipment and a ship, attract soldiers to join your band, and build character and experience. Alignment, a new character quality, makes it possible to fall prey to the forces of evil—to align with them.

In the sea adventure phase of *Odyssey,* a real-time watch keeps you informed of oft-changing wind direction and currents; you navigate your ship by manipulating sails and anchor. One island contains the catacombs in which the orb is rumored to lie. The catacombs adventure is a mini dungeon campaign within the program, and it's the only phase not in hi-res.

With orb in hand, you must locate the island of the castle. To gain the castle itself, you must overcome several obstacles by pure wit; force doesn't work. Items that seemed to have no use before become crucial, and clever thinking is your only saving grace. The obstacles vary each time you play.

When you've accomplished the object, you're given a summary of your activity and a score, which, once you get the knack of winning, you can try to better. You're also given a character summary based on your overall alignment.

Other than the catacombs, *Odyssey* is done in the fine hi-res on wash colors Bob Clardy is so good at; and he's gotten even better. Castles, temples, ruins, huts appear only when you get near enough to see them, but remain in view after that. With enough horses, your troops can ride instead of walk, and lucking into a flying rug—reusable—speeds up travel even more. Three towns show at all times, but caravans of merchants occur at random. Wizards, bandits, mercenaries, soldiers, and monsters all roam the landscape with you. Monsters such as pterodactyls and rocs fly in swarms.

At sea, you may become caught in a giant whirlpool or lose all visibility in a storm or fogbank. Sometimes you must continue to navigate via longitude and latitude alone. It's a whimsical touch that the greatest hazard on the ocean is that of sailing over the edge. In *Odyssey*'s universe, the world presumably is flat. Fortunately, your game is retrievable from this instant disaster.

Odyssey: The Compleat Apventure is a fun and canny fantasy game to lose yourself in for a few hours. It can last longer than that—or much shorter, if you lose—but the ability to save (on a separate disk) is built into quitting, a convenience no longish game should be without nowadays. MCT

Odyssey: The Compleat Apventure by Robert Clardy. Synergistic Software. Apple II/II+, 48K RAM, Integer Basic. Disk. $30.00.

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PFS is written in conformation with the datagramming philosophy discussed in September's *Softalk* by John Couch, vice-president of software for Apple Computer. As such, it gives the user, rather than the author, control of the data. No higher praise can be proffered. ART

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Apples Are Handy

Softalk Photo

For Handicapped People

BY MARGOT COMSTOCK TOMMERVIK

Top: Joe Villareal. Lost winter he learned to ski. Above: Multiple sclerosis victim Anito Kunis, the first volunteer for Avant Courier's program, learns to run the Apple from Phil Miller.

Joe Villareal operates a political information service from his small apartment in Palo Alto, California. His Apple is his chief and indispensable tool. Without it, he would have to seek work in an office, his choices narrowed to those with facilities to handle his wheelchair.

Dave McFarling manages his own computer software company in Lincoln, Nebraska. He advertises and sells his product nationally. McFarling, like Villareal, works from a wheelchair. But McFarling uses only one finger to type, because the only limbs he can move are his arms, the left only slightly; the rest of his body, including all his fingers, cannot respond to his will.

Phil Miller, with two partners, runs a software company in Morristown, New Jersey. He also runs a new company called Avant Courier. Phil Miller has no handicap; but he cares about people who have. So he designed Avant Courier to provide homebound handicapped people with Apples and to teach them to use Apples to build their own businesses, and, coincidentally, their pride.

The Refreshing Quality of Apple-Aid. With the proliferation of the personal computer, more and more people with handicaps can obtain the benefits of the machine that can, at least in business, compensate for their losses. You don't have to walk, hear, see, be graceful, or be agile to use a personal computer. In fact, the day is coming when people who have only the ability to blink their eyelids will be able to use Apples to communicate.

But, unless handicapped people have the innovative minds and abilities of a Joe Villareal or a Dan McFarling, qualities rare even among unhandicapped people, they need people like Phil Miller to introduce them to the computer, to teach them how to use it, and to help them overcome problems and needs that require mobility or sight.

Phil Miller of Softagon, a New Jersey software company, and Ken Greene, owner of the first Computerland store, founded Avant Courier as a company for direct sales of software to retailers. In the process of setting up, they discovered a business that could be run from a home and implemented by a personal computer, that was supported by existing software, had a short learning curve, and returned a good profit with a minimum capital expenditure.

It did not take Miller and Greene long to realize that Avant Courier might be better turned to a new purpose. Miller began investigating peopling a mail-order business. He soon realized that many physically handicapped people had no difficulty handling all aspects of such a business.

Avant Courier Helps People Help Selves. They decided to make Avant Courier a company for sponsoring the training of handicapped people to run Apple computers as the foundations for their own professional mailing services. Miller's plan called for the two partners to make the sales and for the mailing businesses to implement them. The only problem was the initial cost of the computers.

In New Jersey, the homebound handicapped are supported by the state. Miller and Greene figured that a handicapped person operating a mailing service could make $16,000 to $21,000 a year, considerably more than the state provides and plenty to get him or her off the dole. Surely, they thought, this would be a program the state would embrace. Therefore, perhaps the state division of vocational rehabilitation or the department of labor would consider providing a grant to buy the Apples. Miller believes that this is a duty of the state, beyond the fact that the state would benefit.

They worked up a formal proposal for Carole Schneider, representative of the vocational rehabilitation division. Schneider believed in their idea, and took it before the registration director of the division. Added impetus for state action came from Washington, which pays 80 percent of such expenses.

During several months of waiting for action from the state, Miller began working with several wheelchair-bound people on the Apple. He presented Avant Courier's idea to still others and received enthusiastic responses.

When the call finally came from the state, the answer was disappointing; state policy regarding the homebound handicapped allowed for $2,000 per person for equipment, an amount that was established more than ten inflationary years ago. Also, the state wanted to be assured that any equipment bought would return its investment in one year. Finally, decision on the proposal was postponed to a meeting several months down the road.

Successful Houses Would Hire Others. Meanwhile, Miller had begun to see possibilities for employing people with other types of handicaps through these services. People with some degree of retardation could handle envelope stuffing and mailing. Others could take care of pickups and deliveries.

But, if anyone were to be involved in the system who was not "homebound," the state would not even consider support.

Miller decided to look beyond the state. He revamped the proposal for Avant Courier and mailed it off to several large corporations that are known for their cooperation in charitable and public interest programs. It is too early to tell whether any will respond; but it is not too early to know that the state hasn't.

The Story of Joe. A racing, weaving car sped out of the night darkness sixteen years ago toward the car in which Joe Villareal and a friend were driving home from a hayride. Villareal was napping while his friend drove. His friend had to swerve sharply to avoid the erratic oncomer; he succeeded in avoiding a collision and the other car drove on. But the shoulder onto which he swerved was soft; the car rolled.

Villareal awoke from his nap to face the rest of his life from a wheelchair.

Today, Joe Villareal lives alone in Palo Alto, California, in an apartment arranged to meet his needs. Although confined to a wheelchair, Joe is by no means immobile. He moves his wheelchair and himself about with facility and he drives a car. He smiles mischievously when asked about things he enjoys doing and announces his latest favorite: "Skiing. I went for the first time last year, on the invitation of a friend.

"They have special sledlike 'skis' for people in wheelchairs. You steer with strong ski poles, which work on the same principle as the handbars on a wheelchair's wheels, so I had no trouble learning. It felt great—speeding down the mountain, outdoors, feeling the wind."

Lalo and the Apple Clear Away Political Fog. Most of Villareal's time is spent working with his Apple, however. He and his brother Ormando own a company called Lalo. Lalo is working its way into becoming what Villareal calls a "political information utility company," carrying all kinds of political information online for the use of political planners, campaigners, and workers.

Recently, Lalo conducted a survey in San Jose to determine the effect of registration recruitment on voter turnout in an election. They arranged the actual recruiting, prepared, distributed, and evaluated questionnaires, and then surveyed the actual turnout after the election. Joe Villareal programmed the entire project on the Apple II in Pascal. Finally, the Apple was given all the data, digested it, and will now print out colorful hi-res charts on every angle of every district in the survey. Ironically, the results showed that registration recruitment had almost no effect on number of voters; but the increased number of registrations caused the percentage of registered voters voting to drop in most areas.

Pascal and the Paper Tiger. As soon as the census finals are in, Lalo, its Apple, and the Villareal brothers will be busy at work on redistricting plans for several counties.

Villareal is totally sold on Pascal, and with good reason—he is fluent in the language, and uses it and explains it with equal facility. He also praises his Paper Tiger 440. Its good graphics and mixed type capacities allow him to enhance their research reports with finely honed charts and clear headlines.

To set up these reports, as well as letters and questionnaires, Villareal opts for the Moonshadow Text Formatter.

The Apple is not only Villareal's worktool. It also serves him in his other major interest: creating a network via modem and computer for handicapped people.

Need Cooperation, Not Dictation, from Health Care. "How the handicapped are dealt with is too much out of their hands," Villareal believes. "Too often, doctors treat, not the person, but the disease. They read your symptoms, then prescribe something to modify them. You have no control. The whole concept of rehabilitation suffers the same faults; it's well-intentioned, but it breeds dependence.

"Handicapped people need to impose control over themselves, to realize that they probably can help themselves. I've been studying the Eastern approach, in which people listen to themselves; that approach uses biofeedback and mind control to trigger things in you to allow healing, rather than using surgery or drugs.

"Biology is just starting; it's in the same place that physics was at the turn of the century—and consider how far that has come.

"We need to reach the 'ROMs' in our heads—or really more like the 'EPROMs.' "

More than anything else right now, handicapped people need community networks through which they can help each other. Especially when people are newly handicapped, being able to talk over the problems, fears, anxieties of their situations with others who have been there is crucial.

Through the personal computer, this can be made possible twenty-four hours a day. And when it is, you are likely to see the name of Joe Villareal leading the list of those who made it happen.

Dave's Story. Dave McFarling had his own business as an aircraft mechanic ten years ago, until an auto accident broke his neck in three places. That was on September 13. Doctors told him he would spend a full year in bed, two more years in the hospital. McFarling didn't accept this, and McFarling is a

Write to Overcome Wrong

You can help the handicapped and fight government bureaucracy at the same time. If you support Avant Courier's attempt to use Apples to start handicapped people in businesses of their own, write a card or letter to the governor of New Jersey, asking him to intercede with the state bureaucracy on behalf of Avant Courier's plan.

Your message need not be long, but testimonials on the efficacy of using Apples would be appropriate.

If Apple owners from all over the country express their interest, perhaps Governor Brendan Byrne will be moved to action. Don't think your letter won't count; each reinforcement of support for the concept is important.

Send your card to: Governor Brendan Byrne, Governor's Office, State House, Trenton, New Jersey 08625.

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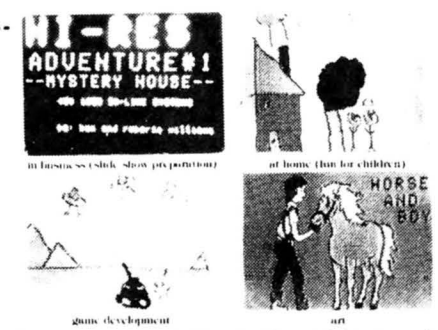

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man with great strength of character. He ate Thanksgiving dinner from a wheelchair, and left the hospital after less than eight months.

But he left without mobility in anything below his neck, except his arms; and the mobility in his left arm is extremely limited. Just his arms; he can't move any of his fingers. And his mind. His mind can and is willing to move mountains.

One mountain appeared in the form of an automobile. Specially equipped cars have been available for paraplegic people for some time; but none is made for people in McFarling's situation. So Dave designed his own hand controls; with them, he's been driving since nine months after his accident.

McFarling had to sell out his own business because of the accident; he promptly went into electronics as an electrical engineer. When the communications industry took a skid three years ago, he looked around and spotted microcomputers—from an engineering standpoint.

Nonconforming Student Tops Class. So he went back to school, to the University of Nebraska at Lincoln, to do graduate work; his classes focused on 6800 and 8080 microprocessors, but McFarling was convinced that the 6502 was the microprocessor of the future. Only through persuasion and his willingness to provide his own Apple to work on did the university agree to McFarling's concentrating on the 6502.

Dave admits that he had to overcome prejudice because of his handicap at the university—"until I graduated third in my class."

Seeking a computer engineering job with his Apple proved fruitless, not wholly for lack of jobs. One of the plants had a second-floor lab, accessible only by a flight of stairs; McFarling's wheelchair can't climb stairs. So he began to look at programming.

No Need to Stretch. "There are actually some advantages to an employer in hiring a person handicapped as I am," McFarling says. "What other employee can look at a monitor for fourteen hours straight every day without even stretching or getting stiff?"

McFarling applied this "advantage" to learning programming, and, in next to no time, he landed the project with Osborne/McGraw-Hill that is still the backbone of his company, Small Business Computer Systems. He translates McGraw-Hill's accounting packages for the Wang and CBasic into Applesoft with 6502 machine language. This is not merely a translation of language, but of methodology. When he finishes a package, it runs on the Apple just as the other version does on the Wang and CBasic, except that McFarling's version has been enhanced.

The Apple system on which McFarling works consists of a 48K Apple II with Applesoft card, a Centronics 779 printer, two regular Apple disk drives and four Lobo eight-inch disk drives, a Digital Decwriter III with serial interface, an NEC Spinwriter, the Mountain Clock, the D. C. Hayes Micromodem, and the Source (TCA 923). He has ordered the Apple Language Card and looks forward to trying his hand at Pascal.

The system has been given minor modifications. Because the limited movement in his left arm is just enough to allow him to touch shift and control keys, leaving him use of only his right arm and of none of his fingers, McFarling claims membership in the hunt-and-peck school of typists; he chuckles at the knowledge that that distinction is definitely not limited to handicapped people. The only actual modification to his system is an extension of the repeat key to a button on the left where a kick from his left wrist can operate it. Handling disks is difficult, so McFarling has developed a special bench with a carefully designed layout for his tools and equipment.

Make Life Easy for the Apple. There are other modifications McFarling has made to improve his programming, however. He developed an autostart routine long before that utility was widespread; he has speeded up his cursor for editing at double speed. And he has developed programs to help program: he created a program to merge before Apple's renumber program came out; he breaks programs up to use sections in other programs; and he has developed a method for doing in one step, using Applesoft, operations that appear to require modules in Pascal.

Softalk Photos

Above: Joe Villareal works on his Apple via his extended keyboard interface. Below: Friends made a wooden casing for Villareal's portable keyboard.

McFarling has not wavered in his respect for the Apple. "The Apple machine language at one meg [megahertz] will outdo the 8080 at four megs in actual operation," he says. And in explaining programming he has done that many would consider impossible on a microcomputer, he says, "I approach the Apple from an engineering viewpoint: if I make life easier for it, it'll make life easier for me." Evidentally, Apple responds to this version of the Golden Rule.

Hire for Ability, Not Disability. The worst approach you can take to handicapped people is to coddle them because they're handicapped, in McFarling's view. The second worst approach is to discriminate against them.

One category of people McFarling would like to see change their attitude toward the handicapped is employers. "Employers need to hire on ability, not on disability; they should never hire because of a handicap."

Since he's had his programming business, all three Lincoln companies that turned him down have come to him with special work; all three have offered him jobs. This time, he turned them down.

McFarling points out that the problem of access to offices is on its way to being solved by computer use, although it remains very real presently. But soon the handicapped employee will be able to "call it in"—do his job via personal computer and modem.

No Room for Free-Lunch Attitude. The only segment of society against whom McFarling truly rails are other handicapped people. "A lot of the prejudice we experience has a basis in reality, the result of contact with handicapped people who think the world owes them a free lunch. Some handicapped people need a kick in the pants; they're not persever-

ing enough in standing up against obstacles or in pounding away at the establishment.

"The state has sent people to look over my company. They can see my success, but they aren't willing to work for it themselves.

"When a company hires a handicapped person, there must be give and take on both parts. Handicapped workers should take a moment to put themselves in their employers' places. The bottom line is that you must be making your employer money or you aren't a good employee, handicapped or not."

Handicapped People Need Each Other's Help. McFarling is even more emphatic than Villareal about the importance of handicapped people helping each other. "At the beginning, you face so many insurmountable problems, and the doctors don't know." The only people who do know are those who have been in similar situations. "And yourself. You have to be willing to help yourself."

McFarling is willing; he certainly doesn't wait for help from others, no matter how incredible the task.

Again recall Joe Villareal, his belief that biology is in its infancy, his interest in biofeedback.

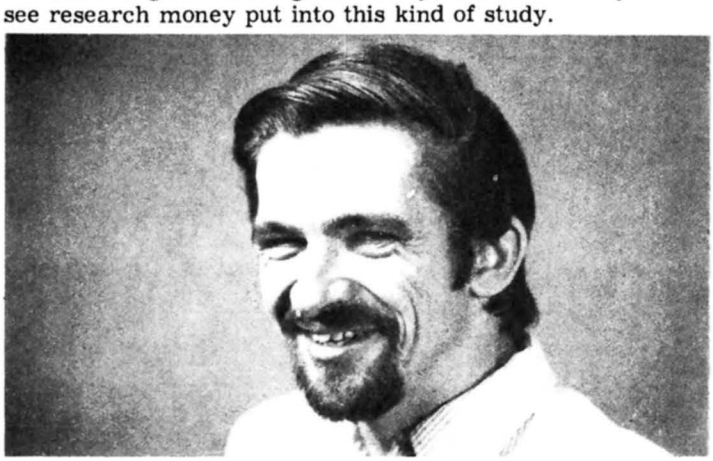
Dave McFarling also found biofeedback interesting. So he built his own biofeedback unit. It can measure muscle activity in arms or torso. Trying it on himself, Dave could find such activity in useless muscles, ones where no activity was presumed to be.

Possibilities for Miracles. With work, the device could be used for exercise control, because it could locate activity, work on the involved muscle, and strengthen it. Yes, even possibly regain its use. At worst, it could be used to model electrical devices to do the tasks of seemingly useless muscles.

McFarling would like to interface the biofeedback unit to the Apple, then develop software that would allow selected muscles to issue specific commands; the movement of each available muscle would control a predefined function, such as the blink of an eyelid causing the Apple to respond with the RETURN function.

"I'd work on it a lot more if I didn't have to eat," he shrugs. "So would other people."

McFarling isn't asking for money, but he'd clearly like to see research money put into this kind of study.



Dave McFarling

Information, Please

Softalk is teaming with Dave McFarling, Joe Villareal, and other concerned citizens to provide a clearinghouse for information and assistance to the handicapped. Programmers may submit work developed to aid the handicapped for evaluation, quality testing, and debugging and may, if they desire, have access to Small Business Computer System's national distribution network. Information on grants and forms of self-improvement assistance is being gathered and will be made available to any person interested enough to request it.

Please write to Softalk Assistance, 10432 Burbank Boulevard, North Hollywood, California 91601.

And if it were, and the theory worked, no one would be more deserving of its miracles than this Apple programmer without self-pity, without need, a strong man with the spirit to make a great life with his mind alone.

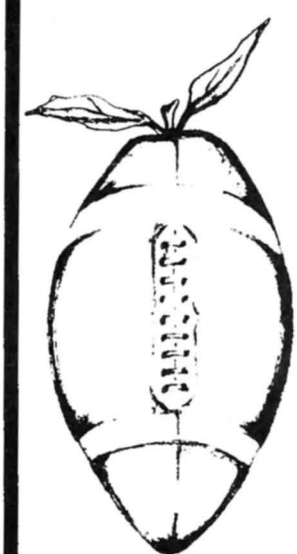
More to Come. New ways the Apple can help handicapped people are being discovered regularly, some by research and many by the handicapped themselves.

There seems no appropriate way to end this story. Certainly, it isn't appropriate to consider ending our search for Apples' uses for handicapped people.

That's a story that has only just begun. ■

Dove McFarling wrote o messoge for Saftalk readers: "Nothing, absolutely nothing, is impassible. True, there are same things the world is nat yet reody for—ar not yet willing to occept. When the chips ore down, the difference between the possible and the impossible is the true measure of o mon's obility."

HI-RES FOOTBALL



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WATCH FOR IT!!

COMING SOON FROM

ON-LINE SYSTEMS

OPDENDYK

from page 9

director of quality assurance. The importance of the position is indicated by the fact the job reports directly to Opdendyk.

"He will work directly with the authors and will conduct postauthor testing before we market a product. He'll also be responsible for dealer coordination on quality assurance and conduct site testing of our new products."

What Personal offers that most profits the independent programmer is access to their channels of distribution. Besides their encompassing national distribution setup, they have firmed representation for their products in Europe and expect soon to announce similar arrangements for the Far East.

Because Personal's products are developed to support most of the microcomputers available, "We can move tens of thousands of units of a program if it has the right ingredients."

Friends in Hard Spots Mean Head Starts. Personal's close association with the microcomputer manufacturers benefits the company and its software developers. Hardware companies often share advanced design specifications with Personal.

Getting this information months in advance of the actual marketing of new hardware systems means that Opdendyk can have teams of programmers preparing applications software for release almost coincident with the product.

"It's a synergistic relationship. By knowing in advance the specifications of a new product, we can support the product with software. On the other hand, we often have authors referred to us by the hardware manufacturers."

Personal has divided its software editors, who are themselves skilled programmers, into development teams to work with the independent programmers in the field. They currently have dozens of programs in development, but that's not an indication that they're forging ahead indiscriminately.

"We could have hundreds of programs in development now," reports Opdendyk, "but we're more comfortable in an environment that emphasizes high quality over high volume."

A prime area of emphasis is on desktop tools for the professional. Opdendyk observes, "Apple got the professional user interested in the microcomputer. *VisiCalc* provided a useful tool. Now we're developing products to complement *VisiCalc*."

Sailing Personal into the Wind. Opdendyk views his recruitment to Personal as the result of a logical progression. "Peter and Dan built a ship, but now they need someone to come aboard as captain and steer it."

The nautical simile comes easily to Opdendyk, who berths an ocean racing sloop in Sausalito and retires to it to recharge his energy on occasion.

Naturally, he also races it. Since its purchase three years ago, he's gone "from dead last to first" in his class and finds strong similarities between racing and business.

"Everybody racing in a class has basically identical boats. It's not the person with the newest boat or the fanciest equipment who wins. You win by not making mistakes, emphasizing quality of seamanship, perfecting teamwork of the crew, coordinating properly, knowing which way the wind is blowing, and anticipating what exigencies may arise."

These are also the attributes of expert business management. As Opdendyk points out, "Personal is a leader today because Dan Fylstra and Peter Jennings foresaw the trend toward business and professional use and moved to serve that market earlier than others. We believe we see other trends forming and are positioning ourselves for their eventuality."

None of Opdendyk's recent positions have exactly facilitated observance of the forty-hour workweek, but he reports no complaints from his wife of eleven years, Jan. "We each feed off the energy and joy of the other. She's absolutely marvelous about my long hours and ecstatic over my success."

Opdendyk is in the envious position of being handed the helm of the ship after it has cleared harbor and is well in the lead. But heavy seas lie ahead in the form of the growth rate projected for Personal; it will take all his ability to bring Personal safely to its goal four years away. ■

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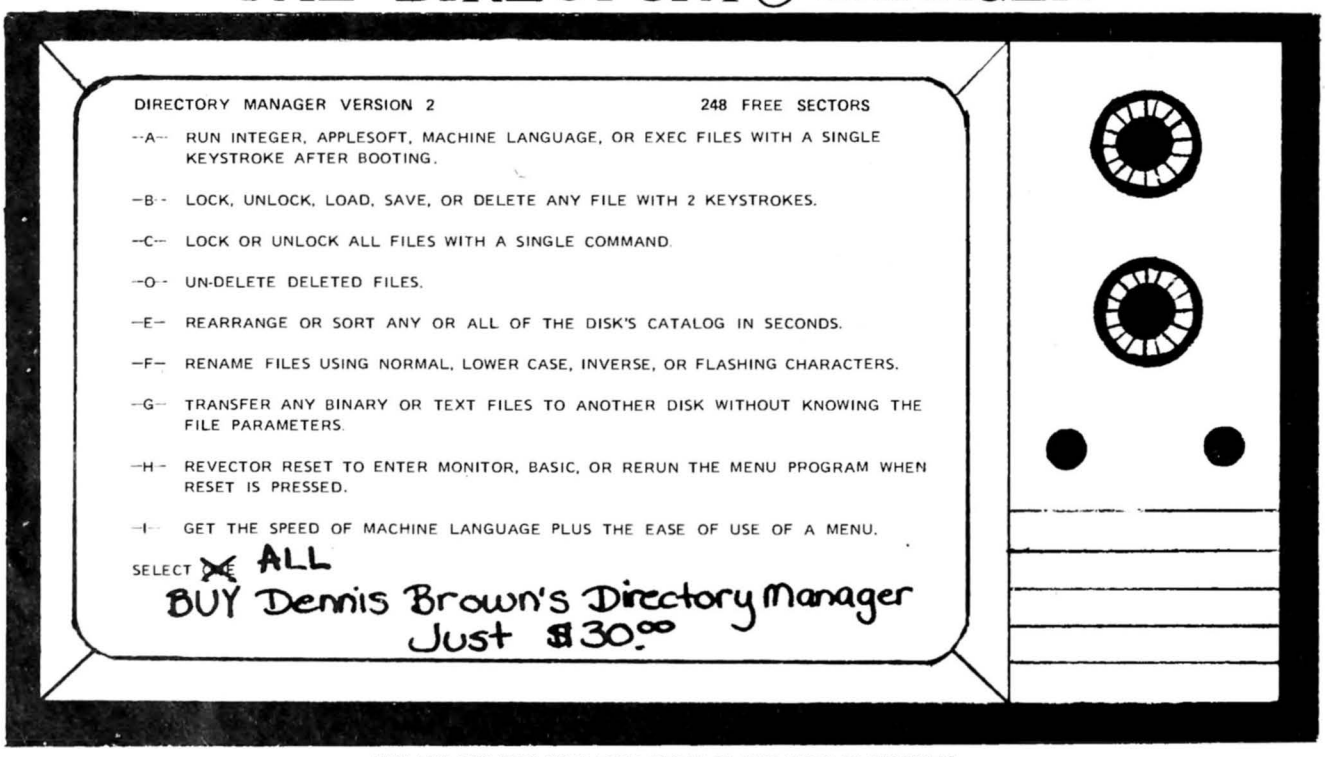

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Softalk Presents The Bestsellers

Bill Budge clearly emerged as the star of *Softalk*'s first monthly software bestsellers poll, despite third billing; but the most significant result was that the tried and true programs of quality maintained their popularity in the face of strong challenges mounted by newer programs, such as *Odyssey* by Synergistic Software and *Mystery House* by On-Line Systems.

VisiCalc from Personal Software leads the list, followed by *Flight Simulator* from Sublogic, *Bill Budge's Space Album* from California Pacific, *Sargon* by Hayden, and *Odyssey* by Synergistic Software.

User-Oriented Tool Wins with Users. *VisiCalc* is not one of the newer offerings on the list, and it is the most expensive program in the top twenty. That *VisiCalc* could overcome these twin handicaps is a true testimony to the revolutionary nature of the program.

Perry Cain of the Basic Computer Shop in Akron, Ohio, voiced the feelings of many retailers: "*VisiCalc* is the one piece of software in my store that actually sells systems."

Skill Challenger Flies High. In its own way, the achievement of Sublogic's *Flight Simulator* was equally amazing. Many respondents reported a slackening of demand because of customers awaiting the first shipment of the software on diskette. That *Flight Simulator* could finish so strongly in the face of a holding pattern by buyers in some markets indicates that it will continue to be a strong competitor in coming months.

The Top Thirty

1.	94.06	*VisiCalc*, Personal Software
2.	87.50	*Flight Simulator*, Sublogic
3.	79.06	*Bill Budge's Space Album*, California Pacific
4.	62.50	*Sargon II*, Hayden
5.	61.56	*Odyssey*, Synergistic Software
6.	60.62	*Adventure*, Microsoft
7.	56.25	*Hi-Res Adventure: Mystery House*, On-Line Systems
8.	51.25	*Typing Tutor*, Microsoft
9.	46.56	*Temple of Apshai*, Automated Simulations
10.	44.38	*Bill Budge's Trilogy*, California Pacific
11.	44.06	*Morloc's Tower*, Automated Simulations
12.	43.44	*Head On*, California Pacific
13.	43.13	*Rescue at Rigel*, Automated Simulations
14.	41.88	*Datestones of Ryn*, Automated Simulations
	41.88	*CCA Data Management System*, Personal Software
16.	40.31	*Super Invader*, Creative Computing Software
17.	37.81	*Wilderness Campaign*, Synergistic Software
18.	37.50	*Bill Budge's 3-D Graphics System*, California Pacific
19.	36.25	*Easy Writer*, Information Unlimited
20.	33.75	*Asteroids in Space*, Quality Software
21.	33.44	*Computer Bismarck*, Strategic Simulations
22.	31.88	*Apple Writer*, Apple Computer
	31.88	*Gammon Gambler*, Personal Software
24.	31.25	Scott Adams *Adventures*, Creative Computing Software and Adventure International
25.	29.69	*Computer Ambush*, Strategic Simulations
26.	28.44	*Tuesday Night Football*, Shoestring Software
27.	24.06	*Apple-Doc*, Southwestern Data Systems
	24.06	*Tranquility Base*, Stoneware
29.	22.50	*The Controller*, Apple Computer
	22.50	*Apple Plot*, Apple Computer

In Terms of Popularity, Bill Won't Budge. The leading individual programmer in this first poll was Bill Budge, whose *Space Album* offering placed third. In addition, Budge wrote four other software packages that found their way into the top thirty, making him both the most prolific and the most popular author of software extant.

Budge's other leading sellers were *Trilogy*, which found its way to tenth, *Head On*, which ranked twelfth, *3-D Graphics System*, which ranked eighteenth, and *Tranquility Base*, which tied for twenty-seventh. All of his programs are distributed by California Pacific except *Tranquility Base*, which is sold by Stoneware.

Chess Winner Shows Fanatic Streak in Users. *Sargon* is another veteran in the marketplace and it has clearly vanquished all other chess programs. Richard Kaapke of Computerland, San Diego, California, reports that he sells a copy of *Sargon* with almost every Apple sale he closes. Although buyers in other regions are not quite so fanatical about chess, almost every store reports a respectable level of sales.

Series Cause Consternation. Before considering the performances of selected other programs in the bestseller list, a disclaimer needs to be made. It was almost impossible with three sets of programs to separate any individual program from its serial relatives.

These sets were the *Dunjonquest* series, Scott Adams' *Adventures*, and the new series of Avalon Hill war games. Respondents were most successful at sorting out the individual sales of the *Dunjonquest* series, while giving overall rankings for the other two series.

The Avalon Hill series was too new to the marketplace to make the top thirty listing for August. Because no accurate method of discriminating between sales for the nine *Adventures* jointly marketed by Creative Computing Software and Adventure International existed, all sales were credited to the corporate entity.

Two Newcomers Rocket to Top. Two of the newest programs in the bestseller list made splashy showings. Bob Clardy's *Odyssey* nosed out Microsoft's *Adventure* for the last place in the top five, and Ken Williams's *Hi-Res Adventure: Mystery House* was a clear-cut and strong seventh. Clardy's *Wilderness Campaign* also made the top twenty.

Automated Simulations placed four programs in the top fifteen: *Temple of Apshai*, ninth; *Morloc's Tower*, eleventh; *Rescue at Rigel*, thirteenth; and *Datestones of Ryn*, fourteenth.

Little Distribution, Large Sales. Among the sleeper programs that figure to make stronger showings as they receive wider distribution are *Asteroids in Space*, by Quality Software, and *Tuesday Night Football*, by Shoestring Software. Neither program appears to have as high as 20 percent pres-

---

Apple-franchised retail stores representing approximately 15 percent of all sales of Apple and Apple-related products volunteered to participate in the poll.

Respondents were contacted by telephone during the first week in September to ascertain their sales leaders for the month of August.

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 respondent were not considered.

Respondents represented every geographical area in the continental United States as well as Alaska, Hawaii, and Canada. Most respondents represented major metropolitan areas, as do the majority of Apple franchisees.

Results of the responses were tabulated using a formula that resulted in the index number to the left of the program in the bestseller listing. The index number is an arbitrary measure of relative marketplace strength of the programs listed.

Probability of statistical error is plus-or-minus 3 percent, which translates roughly into the theoretical possibility of a change of two points, plus or minus, in any index number.

Bestsellers

ence in the market, yet *Asteroids* placed twentieth and *Football* was twenty-sixth.

A true sleeper that figures to make the list next month is *Galactic Trader*, one of three programs in the *Galactic Saga* series by Broderbund Software. *Trader* missed the top thirty by fractions of a point, although its market penetration was less than 10 percent.

Super Invader Conundrum Prompts Alternative Contest Winners. There remains the phenomenon of the popularity of the program variously known as *Super Invader, Space Invaders, Cosmos Mission,* or *Stellar Invaders*—all identical programs or identical in concept. Seven different publishers have out versions of the program, fragmenting the market to where none placed highly on the list. Yet all seven publishers cumulatively would have placed second, narrowly edging *Flight Simulator*.

Because of this unforeseen phenomena, *Softalk* is accepting two sets of answers as correct for its "Win a Prize for Your Apple" contest. The first correct series of answers was listed above. The second correct set of answers is *VisiCalc, Super Invader* (or any other of its several names), *Flight Simulator, Space Album,* and *Sargon*.

Buyers Like Writing the Easy Way. *Easy Writer* from Information Unlimited nipped *Apple Writer* from Apple Computer Inc. as the bestselling text processor. *Super-Text* by Muse barely missed the top thirty. *The Correspondent* from Southwestern Data Systems and the *Magic Window* from Artsci, both introduced in August, already appear to be gaining some backing.

The Controller package from Apple Computer Inc. barely leads the accounting package from *BPI*. But many business-oriented retailers have developed their own accounting packages. Whether any of these will become sufficiently widespread to merit mention would be mere conjecture. ◨

THE LOGICAL WAY

from page 19

Figure 6 shows a simple definition of the problem that might be arrived at intuitively. Although perfectly legal, it is a special case shortcut that is very limited. For example, if our original problem were: "Sum the numbers from 1 through 100 and tell me the result," this "shortcut" would be anything but.

```
PRINT (1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10)
```

Figure 6. Special case shortcut.

Why the shortcut is not particularly useful raises an important point: our method, or *algorithm,* for solving the problem applies to a broad class of similar problems. Without changing the structure of the program, we can alter its meaning by changing the data it uses. By defining variables that represent the *domain* of the set we want to use, we can use the same statements to handle different problems of the same class. The general case algorithm is shown in figure 7 as a *subroutine,* which is defined once and can be invoked at different points in the program. When it is entered, the variables FIRST, LAST, and SIZE should indicate the domain of numbers desired. The RETURN statement returns control to the main program.

```
setup  FIRST = FIRST MEMBER OF SET
       LAST = LAST MEMBER OF SET
       SIZE = COUNT VALUE AND DIRECTION

1 RESULT = 0
2 FOR NUMBER = FIRST TO LAST STEP SIZE
3 RESULT = RESULT + NUMBER
4 NEXT NUMBER
5 PRINT RESULT
6 RETURN
```

Figure 7. General case subroutine.

In this article, we have used stepwise refinement to develop a program using standard data types. This programming system applies equally to representation of information. The process of abstraction of real world data will be tackled in a future article. ◨

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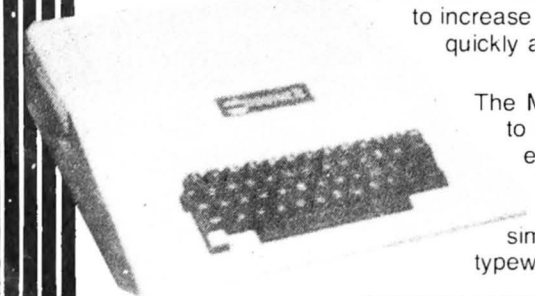

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___	___	Morloc's Tower	$ ___
___	___	Rescue at Rigel	$ ___
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