SOFTALK

VOLUME 1 JANUARY 1981 $1

Apple in the Big Apple

Exec Cal Pacific

Bestsellers

Meet the Disk Drive Doctor

Beyond Adventure Lies

AKALABETH
WORLD OF DOOM

See Review in this Issue

Available thru your local Computer Store.

A TOP OF THE ORCHARD SOFTWARE PRODUCT

from California Pacific Computer Company

CONTENTS

SOFTALK

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Big Apple Gives Little Apple the Business

Apples are selling like hotcakes in New York City—many to megabusinesses.

MARGOT COMSTOCK TOMMERVIK 4

Robot War: Strategy for Learning

Revalutionary concept in gaming software teaches logic and programming thraugh fun.

MARY TAYLOR ROLLO 18

Softalk's First Annual Most Popular Software Poll

Readers have a chance ta air their apinians af the all-time tap ten in papular saftware 26

Disk Drive Doctor Moves East

A very special persan, Mike Carnblith deals in Apple service and general good will.

AL TOMMERVIK 30

Exec California Pacific:

Quiet, thaughtful Al Remmers has made his saftware company a hawling success.

RICHARD KNUDSEN 32

ADVERTISERS INDEX

Avant Garde 10
Book Publishing 17
Broderbund Software 29
California Pacific . . . . . Cover 2
Cavri Systems 31
Continental Software 34
Datasoft 3
Edu-Ware Services 8
FSI 28
Image Systems 12, 33
Information Unlimited . . . . . Cover 4
Micro Lab 14
Microsoft 7
MUSE Software 24
On-Line Systems 19, 21, 23, 25, 27
Peripherals Plus 11
Rainbow Computing 22
Sirius Software 13, 15
Small Business Computer Systems 16
Software Publishing 35
Southwestern Data Systems 26
Spectrum Software 30
Stellation Two 2
Strategic Simulations . . . . . Cover 3
Synergistic Software 9, 20

DEPARTMENTS

Contest and Contest Winners 2
Open Discussion 9
The Logical Way: Bill Depew 12
Marketalk Reviews 16
Tradetalk 21
Assembly Lines: Roger Wagner 22
Marketalk News 28
Bestsellers 36

PREVIEWS

Whispers af February . . . Apple an Television—via the airwaves . . . Exec On-Line . . . Assembly Lines, Part 5 . . . Portrait af Bill Budge . . . and mare.

Holy Smoke! More Contest Winners!

Softalk photo

Korenkiewicz photo

Left to right: Elliott R. Greene of Computerland of Nassau, New York, presents Lowrence Landa with a Magic Window. Landa was winner of October's Bobbing for Apples contest. Gary Iverson of Computer Technalagies, Albuquerque, New Mexico, awards VisiCalc to Mark Korenkiewicz, one of September's contest winners.

Enter the words,
oh so slow
Out with the anagrams
and on we go
Two-sixteen
with which to play
That turkey
had a lot to say
Apple listings
oh so quick
Then a word—
FANTASTIC!

With those words, Dave Pointon of Sparks, Nevada, summed up November's contest. He'll get another chance to regale *Softalk* with poetry if he enters this month's limerick contest.

Fantastic was the message we were looking for, but our program to ensure that it was the only sensible answer available failed miserably, as witnessed by fifty-two entries that found other answers. All were accepted.

J. V. McGinn of Mount Clemens, Michigan, deserves special recognition for finding ten alternative answers, none of which were *fantastic*.

As with every contest in which there is more than one correct entry, Apple's random number generator was used to determine the winner.

Jerry L. Kynsi of Longview, Washington, was so anointed. He chose a selection of Quality Software's entertainment programs as his prize. ■

CONTEST: LILTIN' LIMERICKS

To honor the gremlins so prominent in a game reviewed this month, January's contest involves another product of Irish inventiveness: the limerick.

A limerick is a five-line verse of a light, usually humorous, and sometimes nonsensical nature. Its meter is anapestic, meaning each line is made up of groupings of two short syllables followed by one long one; its rhyme scheme is *aabba*—lines one, two, and five rhyme and lines three and four rhyme. Rules such as these are made to be broken, but your entry must be recognizable as a limerick. Here's a limerick:

There once was a girl from Poughkeepsie,
Who liked to get just a bit tipsy.
When they held back her wine
Just to keep her on-line,
She became an itinerant gypsy.

Writing limericks is meant to be fun, not work, and you need not be a poet to come up with a fun one.

Here are the rules for *Softalk*'s Liltin' Limerick contest:

1. Any subject is okay, and your limerick can be funny, punny, witty, subtle, broad—do what suits you best.

2. Each entered limerick must contain within it either the name of one of *Softalk*'s January advertisers or of one of the products of those advertisers. This name need not be the subject of the limerick, but may be merely worked in some way. For example:

"Odds Bodkins," young Romeo did muse,
"Soft, where are my Juliet's shoes?
Is her power for losing
By chance or by choosing?
Ye Gads, how it doth me confuse!"

3. To be eligible, each entry *must* be accompanied by a secret word, which those rascally gremlins have hidden somewhere in the pages of this issue. When you find it, you'll know it; if you have a doubt, you haven't found it.

4. You can enter as many limericks as you like, but each must be attached to an entry form or a copy or simulation of an entry form.

5. Limericks will be judged the only way they can be judged—subjectively. Judges will be looking for wit, humor, originality of rhyme, and originality in general. *Softalk* judges will choose ten semifinalists whose limericks will appear in the March *Softalk* (Saint Patrick's Day—gremlins at work again), the final winner to be chosen by *Softalk*'s readers.

6. All entries must arrive at *Softalk* by February 2, 1981; late arrivals will be gobbled by groundhogs.

7. First-place winner, chosen by our readers in March, will receive $100 worth of product from one of *Softalk*'s January advertisers. Semifinalists whose limericks appear in the March issue will win $10 credit at their local retailers.

8. Have fun. ■

The Secret Word: _____

My limerick is attached.

The prize I'd like if I win is:

_____

My local retailer is:

_____

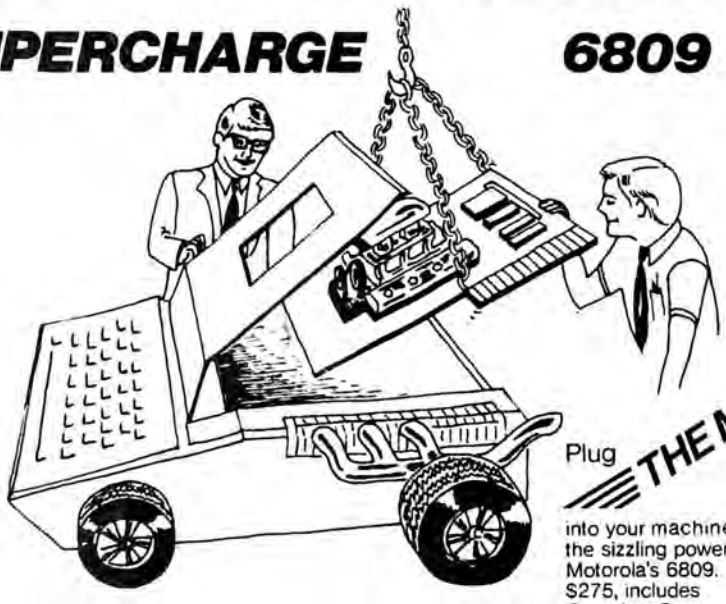
Name: _____

Address: _____

City/State/Zip: _____

My Autograph: _____

SUPERCHARGE 6809



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Businessmen can enhance demonstrations, presentations or illustrations where the emphasis is on color.

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Ask your local dealer for information on Datasoft Products.

MICRO-PAINTER

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*Apple II is a registered trademark of Apple Computer Inc.

THE BIG APPLE GIVES THE LITTLE APPLE THE BUSINESS

BY MARGOT COMSTOCK TOMMERVIK

Apples are booming business in New York City; the Big Apple is giving a warm and massive welcome to the little Apple with a bite missing. From Yorktown to Wall Street, New Yorkers are adopting Apples, not only into their homes, but into the stately halls of giant corporations: NBC, CBS, Time-Life, Celanese, Exxon, Citibank, Bank of New York, Oppenheimer, Morgan Stanley, Columbia University, Fordham—the distinguished list goes on.

Apple is not new to the Big Apple. It's been there just about as long as it's been anywhere in the country. But the emphasis on Apple over other microcomputer brands that formerly topped Apple's sales in New York City and its environs has come about only in the past year and has skyrocketed in the past few months. The Dick Cavett radio and newspaper ads and the Wall Street activity in anticipation of the anxiously awaited Apple public issue have combined to shoot Apple sales sky high.

New Yorkers, contrary to common viewpoints west of the Delaware Water Gap, are an enthusiastic, caring—if streetwise—kind of people. What is taken by non-New Yorkers for unfriendliness or scepticism is merely caution: the conviction that knowledge must precede action or display. There's no truer friend than a New Yorker—but you won't gain that friendship until there's no chance it'll be withdrawn.

So it is with New Yorkers' enthusiasm and acceptance of product. Now that Gothamites have tested and tried, now that the value is proven, they are flocking to buy Apples. And it's not likely they'll quit.

Off-Path Location Shelters Top-Volume Retailer. Thus, a tucked-away—if anything two blocks from Grand Central Station can be considered away—store like the Computer Factory can afford to wait to be sought.

You have to know where you're going to visit the Computer Factory. Shunning a storefront in favor of a set of three side-by-side facilities along an arcade within a building running from one street to the next, Computer Factory turns its back—or its blank outside walls—on walk-in trade. Yet it is within the top few and may indeed be the largest volume dealer of Apple computers in the country.

Since the airing of the Dick Cavett Apple radio ad campaign in New York City, Computer Factory has not failed to reach the century mark in Apple sales in any week. In straight language, they're selling at least one hundred Apples every week. That's a hot product.

The day *Softalk* visited the Factory, it was buzzing with activity. A full Manhattan-size complement of people lined software racks and peripherals counters; and the closing room, a private office for people buying computers, was never empty.

Formal Attire Adds Professional Flavor. Unlike many of Manhattan's Apple dealers, 35 percent of Computer Factory's sales are to individuals for home use. Even of these, many customers come back for a second Apple to take to the office.

The personnel gear their tone and their dress—mostly three-piece suits—to accommodate the other 65 percent, the business sales to large businesses (New York's Citibank is among their customers) and small. "We understand the needs of the small business because we are—were—one," says Greg Pearlstone, marketing manager of Computer Factory.

Computer Factory calls itself the one-stop shop for computer equipment and boasts the most complete stock of Apple gear in the city of New York, according to Pearlstone. "Where other retailers stock one or two word processors, their favorites, we carry every one made. We stock all peripheral boards and every possible chip and part, as well as most software."

Buy Your Apple at a Bookstore. Broad steps descend as to an amphitheater to the several underplayed commercial enterprises surrounding the sunken entrance to the McGraw-Hill Building on Manhattan's Avenue of the Americas. The path most trodden leads to the McGraw-Hill Bookstore.

A bookstore seems an unlikely place to buy computers, but at the McGraw-Hill Boookstore, always popular with book buyers and browsers, the computer department seems a natural extension of its technical book line.

By virtue of the same management thinking, the bookstore was an early retail outlet for Hewlett-Packard calculators.

A year ago, store management wanted to get involved with the micro industry. Parent McGraw-Hill Publishing, itself owner of Standard and Poors and the former Osborne Publishing Company and publisher of *Byte* magazine, approved. The Apple was selected on the basis of recommendation as the microcomputer to carry.

Bruce Tucker, manager of the computer department at the store, attributes a recent giant step forward in sales to Dick Cavett's efforts on behalf of Apple. But the computers were no slouch on the market before, either.

Sky's the Limit When Optimism Prevails. An enthusiastic Apple owner himself, Tucker won't attempt to sell a product he doesn't know inside and out. His knowledge and enthusiasm build confidence in his customers, evidenced by a sample of who they are: Celanese, Morgan Stanley, Exxon.

Until October, Tucker's department was a one-man operation; then salesperson Charles Pringle joined the force. Business is increasing steadily, says Tucker, "and with Apple's expectations, McGraw-Hill's expectations, and my own, the sky's the limit."

Tucker sells more Apples to middle management of large companies than to small companies. Businessmen use the Apple mostly for data and financial analyses. "Higher management uses Apples, then refers lower management to us for their own," Tucker comments. Many come back to buy Apples for their homes, too.

Another segment of business comes from the universities. Tucker has sold Apples to professors from schools such as Columbia and Fordham; but 70 percent of sales are to business.

The Apple II is in its renaissance now, Tucker says; it had a rough start because it didn't look like the things businesspeople are used to. But, "the tough New York market is an acid test, and the II has stood up to the test."

Looks Give Apple III Advantage. The McGraw-Hill Bookstore isn't showing the Apple III yet; it won't do that until Tucker learns it thoroughly. He considers the III "a nice, neat, comfortable integrated unit. Business Basic is good, SOS is fast and powerful, and the keyboard is excellent for word processing; the double-the-II memory capacity is great."

The III will be better accepted by the business community in the long run because it looks more like machines they're used to than the II. "It looks more like machines such as the DEC and Wang, and looks are important. You can see that in software. Well-packaged software, such as that from Personal or Muse, sells faster than cheaply packaged programs."

Clockwise from the top left: Apple on a pedestal at Datel Systems; The Computer Factory; Greg Pearlstone of The Computer Factory; George Pitagorsky, president of People and Solutions, Inc., totes a new solution out of Computer Factory; Super Business Machines, next to historical Old Trinity Church; Charles Pringle of McGraw-Hill Bookstore; Computer Era; Steve Haas of Computer Era; Charles Lewis of Datel ploys Hi-Res Football to an audience.

Softalk photos

Tucker believes the III will cut into the II's sales only slightly. He predicts many mixed orders, with IIs for backup.

"I love my work," declares Bruce Tucker, "I'm nuts about this industry and about this product—the Apple."

Datel Puts Apple on Pedestal. Just a few building away from the bookstore and directly across from the Radio City Music Hall side of Rockefeller Center is Datel Systems. As you enter Datel, you can't avoid seeing a pedestal, and arranged on the pedestal, an Apple II.

Datel carries several brands of computers, but Apple is their largest seller. Business this year, says president Bill Barton, is up 400 percent from last year; the store has thirteen employees and is rapidly expanding.

Datel sells Apples for stock market charting and word processing, but, declares Barton, "Most systems are sold by *VisiCalc*." The tribute to *VisiCalc* is undoubtedly deserved, and well received from a man who discovered during the course of the recent COMDEX convention in Las Vegas that his individual store is responsible for 1 percent of all *VisiCalc* sales.

Still, it should not be overlooked, when considering *VisiCalc* as selling Apples, that *VisiCalc* is available for other brands of computers as well.

Among its regular customers, Datel counts two television networks, Time-Life Publishing, and Bank of New York.

Wall Street Supplier Sells Apples by the Dozen. Super Business Machines doesn't wait for customers to come to it; walk-in customers are not its trade. Instead, Super's salespeople go into offices to make their sales. That practice, along with the store's emphasis on the Apple as a corporate middle-management vertical tool, result in single orders that vary from five to thirty Apples, often with promise of four or five hundred more Apples to be ordered later.

Super counts among its customers many names commonly found among the *Fortune* 500, and several representatives of the top twenty-five of that prestigious group.

Along with Apples, Super Sells Service. Super's staff and their clients think so much of the Apple that the Super people have written proprietary software to enable those clients to use the Apple for numerous previously unprogrammed management tasks. Yet they seldom sell an Apple as an accounting machine, and they've never sold one as a word processor; they don't need to. Among the uses they've implemented with their own software is managing the bond market; according to Super, no one else does this.

Along with Apples, Super sells service, in true big-business, New York fashion. Being a business machines store first—and exclusively until the last couple of years—Super never dropped the habit of servicing its products in the customers' offices. The store is a class A level one service center for Apple, and provides this service on call as quickly and efficiently as any other computer company—including those handling the best-known mainframes.

Because it has been a business machines store for a long time, Super has a built-in clientele that its sales force can introduce this revolutionary new product to. But they're finding that their customers are doing a lot of talking, too, and new prospects are calling Super with interest in buying Apples.

Apple Speeding to Sales Leadership. Last year, says store representative James Grimaldi, only 10 percent of his time was spent on computers; his main focus remained business machines. This year, computers, primarily Apples, are commanding 60 percent of his time.

This change reflects a change in business thinking—an enlightenment Super has had no small part in bringing about. For example, a New York bank, one of the top five in the world, is considering a major order of Apples to fulfill a need

WHY THE MICROSOFT RAMCARD™ MAKES OUR SOFTCARD™ AN EVEN BETTER IDEA.

Memory — you never seem to have quite enough of it.

But if you're one of the thousands of Apple owners using the SoftCard, there's an economical new way to expand your memory dramatically.

16K ON A PLUG-IN CARD.

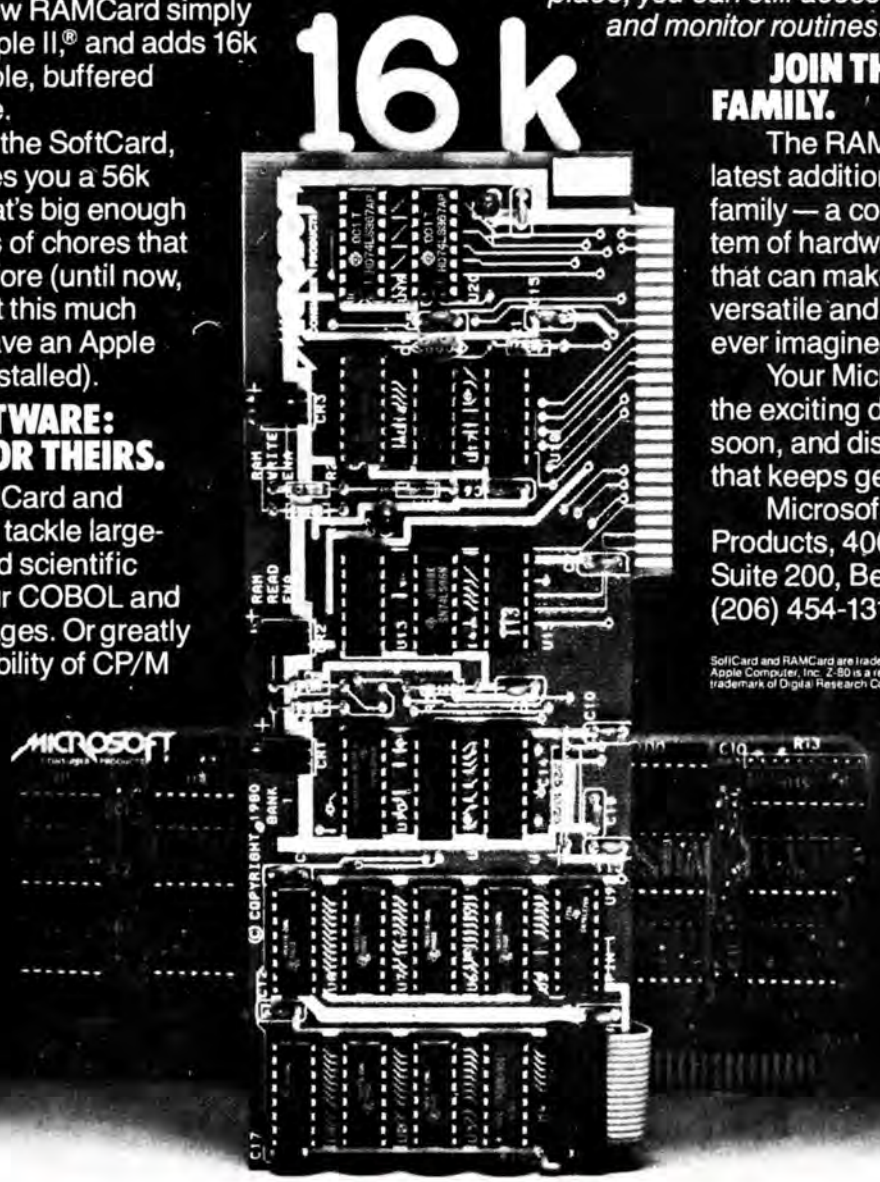
Microsoft's new RAMCard simply plugs into your Apple II,® and adds 16k bytes of dependable, buffered read/write storage.

Together with the SoftCard, the RAMCard gives you a 56k CP/M® system that's big enough to take on all kinds of chores that would never fit before (until now, the only way to get this much memory was to have an Apple Language Card installed).

GREAT SOFTWARE: YOURS, OURS, OR THEIRS.

With the RAMCard and SoftCard, you can tackle large-scale business and scientific computing with our COBOL and FORTRAN languages. Or greatly increase the capability of CP/M applications like the Peachtree Software accounting systems. VisiCalc™ and other Apple software packages can take advantage of RAMCard too.

And RAMCard gives you the extra capacity to develop advanced programs of your own, using the SoftCard and CP/M. *Even with the RAMCard in place, you can still access your ROM BASIC and monitor routines.*



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The RAMCard is just the latest addition to the SoftCard family — a comprehensive system of hardware and software that can make your Apple more versatile and powerful than you ever imagined.

Your Microsoft dealer has all the exciting details. Visit him soon, and discover a great idea that keeps getting better.

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MICROSOFT

for which they had planned to purchase DECs; Super got to them before they had taken action.

Within a year, Super will surpass all its sales in business systems with the Apple, Grimaldi believes. "I'm a naturally pessimistic person who's been made into an extreme optimist where the Apple is concerned."

What has caused this great boost in Apple sales to the corporate market? Other than Super's unique marketing techniques and service policies, Grimaldi attributes much of the boom to the "legitimization" of Apple through the public offering of stock. Extra oomph was added through the *New York Times* front-page coverage of the proposed offering and of Apple Computer Inc. And the radio and newspaper Dick Cavett ads haven't hurt, although Super credits its own radio spot on WINS as a major spur to its own growth.

Talking with Grimaldi and others at Super Business Machines leaves no doubt that Wall Street is welcoming the Apple with open arms and a pleasured eye on the balance sheets.

High Principles Pay Off in Computer Era. Strictly business is also the keyword at Computer Era on Third Avenue on Manhattan's fashionable Upper East Side. Customers come from all kinds of businesses; with a touch of mystery, Steve Haas, proprietor of Computer Era, declines to specify uses for which his customers purchase Apples, but reveals that his clients "have some very sophisticated applications; many have had to write their own software."

Computer Era sold electronic parts for many years before adding computer lines four years ago; it has been carrying the Apple for two years. At present, Apple and Vector have been trading off first position in sales from week to week.

A thoughtful man whose gentle enthusiasm disdains any smack of the bandwagon, Haas believes the most important principle in selling a computer system is "to make sure the system includes the right item and software for the customer," whether he believes that means Apple or another system. Apple often happens to be the "right item."

"The Apple is extremely viable," Haas says, and the subtle enthusiasm begins to creep into his voice. "Apple is a product you can sell proudly."

Proud Owners Prompt International Trade. Principles and pride are no strangers in Haas's life. He cannot understand the "get-rich-quickers" in the industry. "When you sell a computer system, you're selling a business machine, not a television set. Someone's business hangs on it."

But the profit-takers don't bother Haas overmuch; an elder statesman by contrast with the mid-twenties majority in the microcomputer world, he sees the get-rich-quickers as a passing phenomenon.

To Haas's clientele, ads don't much matter. The best business promotion is the satisfied customer. "Heads of companies learn about the Apple by word of mouth; pretty soon, they buy one for themselves." And pass the word to still others.

This age-old advertising method works on an international scale for Computer Era. Because of the inflated prices of everything overseas, people are coming from Europe to America to buy machines. Many arrive at Computer Era on the recommendation of friends in Europe who bought their Apples at the store.

Like Super Business Machines, Computer Era offers service on the customer's premises.

DDP Sells from Office, Not Store. Still another approach is taken by DDP Systems. Although a retail vendor of computer systems, DDP maintains not a store, but an office; and to prove it, the facility is in an eight-floor suit, in Gotham's west thirties district known as Chelsea.

In its office environment, DDP offers a comfortable place for potential clients to try out the computers while enjoying coffee and calling for assistance from the staff if they wish. Visits are by invitation or appointment; the company doesn't want walk-in customers.

DDP sells a full line of minicomputers, but it carries only one micro. The Apple holds its own among products such as DEC, IBM Series I, and Control Data for about 10 percent of the company's sales.

Once a Toy, Now No Limits. "A year ago, the Apple was a toy," says David Mack, chairman of DDP Systems. "Since then, Apple Computer Inc. has done a good job of presenting it seriously. Now, we can sell it as the powerful tool it is."

In commenting on the Apple III, Mack made very clear his opinion of the II. "The II is just as good as the III. The III is nice—it has a better keyboard, more memory. But it's not worth it because you're not limited by the II. I haven't yet found the limits of the II."

Most of DDP's clientele consists of small business people, professionals, and executives of larger companies who want business tools on their desks. The Apples are used mostly as business controllers, individually or in networks of three or four Apples.

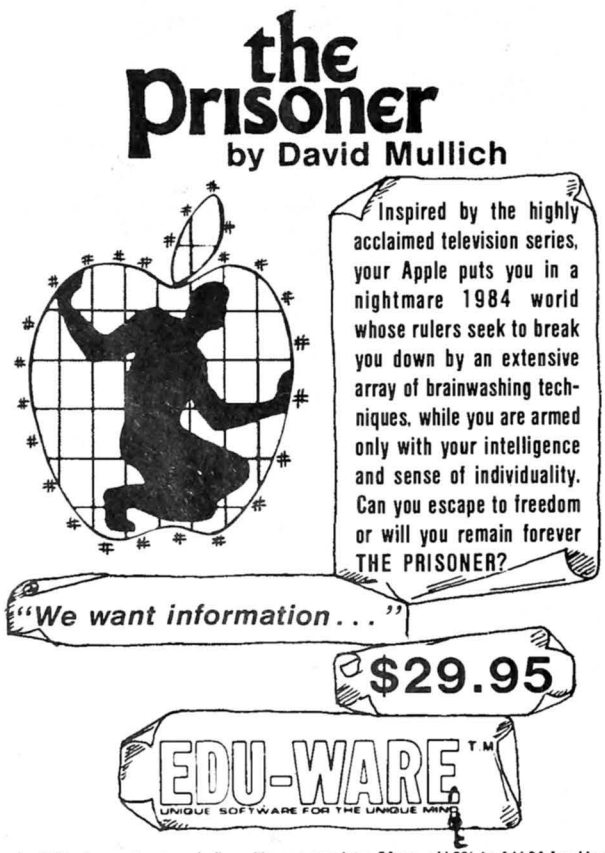
Skiers Find Apples Shortening Lift Waits. Like Barton at Datel, Mack considers *VisiCalc* better than any other commercial software to date. Executives of large corporations buy Apple systems with *VisiCalc* for budgeting and for creating budget presentations.

Occasionally, there are unusual applications. Recently, DDP sent representatives to Austria on request to develop custom software to hook the Apple to a card reader for a ski resort; skiers would merely show their prepaid card to the card reader to gain entry to the ski lift.

DDP is in concord with the other strictly business suppliers in its attitude toward service. Mack emphasizes the importance of keeping in touch with clients' needs by visiting clients' offices. "We sell teaching as much as products," Mack says. The company spends an average of two days in a client's office to expedite setup and learning.

The Market Felt Round the World. As usual, when New Yorkers move, they move in a big way; when Manhattan's business community acts, it makes waves felt throughout the country and the world. The ripple effect it is creating with its enthusiastic acceptance of Apple has only just begun.

The end results are astounding to contemplate. ■



OPEN DISCUSSION

Classified Information

May I ask why you request the serial number [of subscribers' Apples]? It was explained [in September's *Softalk*] that you use Apple's list which is where our Apple is registered. No other magazine we subscribe to makes this request.

My son shared your first issue with his fifth grade classmates. Star Wars was a big hit!

For me Marketalk is great.

R. B. Sawyer, Bronx, NY

No other magazine requests your serial number, but they do ask for something Softalk *doesn't: money. Because* Softalk *is mailed to Apple owners free, and because it is available in stores as well, we have no way of knowing if people "subscribing" are Apple owners; if they are not Apple owners, and we count them in our circulation numbers, we are being unfair to our advertisers—who are the people that make it possible for you to receive* Softalk *free. Requesting your serial number is merely a means of determining which of our readers actually own Apples. The number will not be used in any way other than to count our circulation for advertisers' information.*

Softalk *is not always mailed through Apple Computer's list. Being on Apple's list will not ensure your getting* Softalk *regularly; this is a major reason we ask our readers to mail their names and addresses to* Softalk*; only this way can you be sure you are on* Softalk*'s circulation list.*

Any people who received the September Softalk *but did not receive the October issue can be certain they are not on* Softalk*'s mailing list; unless they have already mailed in a sign-up card or coupon, they should do so now, including—in lieu of money—their Apple serial number. If you missed copies and wish to obtain them, back issues for September and October are available for $2.00, which covers first class mailing. November and December issues are sold out and back issues are not available.*

Apple Power

I am the owner of an Apple computer and president of the Apple Power Users Group of Long Island, New York. Kindly add my name to your mailing list in order that I may begin receiving *Softalk* as soon as possible.

Jim Lyons, Farmingville, NY

We are happy to have users groups and clubs encourage all their members to sign up for our magazine. Any club that wishes to send all their members' names and addresses in a package—with members' permission—may do so; each name will be processed as though it had been sent individually.

Magical Loading Machine

Your article about Frank Krogh's loading machine rang a bell in me. I had his problems too, but solved them a bit differently. This solution uses audible feedback for indicating the proper playback level, and it is possible to monitor tape playback regardless of whether the computer is being loaded or not. This way, a new record can be found without unplugging the earphone jack.

Reinhard K. Quednau, Nolensville, TN

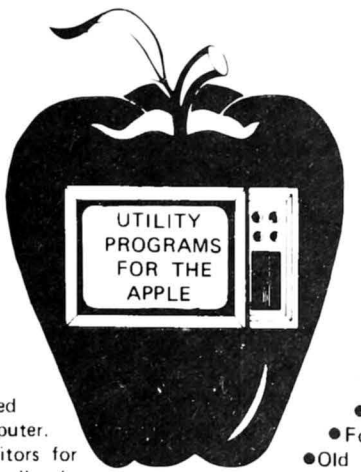
Dealer Gift and Softalk Goofed

Thank you for sending me the October back issue in response to my check and signup form. Unfortunately, I asked for the September issue—because of the letters praising it in the November issue, which my dealer gave me with my new Apple.

SYNERGISTIC SOFTWARE

Program Line Editor

by Neil Konzen



Higher Text

by Darrell & Ron Aldrich

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OPEN DISCUSSION

Would you be kind enough to debug your mailroom and output a copy of September *Softalk* as ordered? Thank you.

Incidentally, I do enjoy your articles and look forward to more and bigger. I'm also interested in reviews of computer-education software for ages twelve to sixteen.
Paul J. Friedman, La Jolla, CA

Club Offers Side Benefits
Let readers know that members of A.P.P.L.E. can get an Integer Basic in RAM. That and their program line editor (only $600 long) are worth the price of membership.
D. C. O'Shea, Atlanta, GA

Shopping Ideas
Softalk is very helpful—it has given me some good ideas about programs I'll be buying.
L. Brenner, Oakton, VA

Programming Enthusiast
This is the second copy of *Softalk* I have received, and I must compliment you on your fine publication.

In addition to some great articles, your technical information is super. Your article last month [September] on "Illegal Commands" was readily understandable by me the first time, and workable. The series on assembly language looks like it will be great for someone like myself (less than expert status).

P.S. Have any remedies for tired eyes?
Henry Getson, Cherry Hill, NJ

Thanks for the compliments. Now to the problem that many computerists share: tired eyes. One solution is spending less time looking at a monitor screen, which means spending less time with your Apple. We have yet to find anyone willing to implement that solution, however. Some relief comes from double folding a washcloth, saturating it with warm water, and holding it against your eyes for several minutes.

If you're willing to do without color, there is a monitor available (Sanyo, $325) with a green screen. This cuts down greatly on the glare and eye fatigue.

Neighbors
Looking at the magazine *Apple Cookbook*, I saw your advertisement about your new magazine, *Softalk*, for Apple users.

I'm very interested to get your magazine for my computer club; we have more than twenty-five Apple users in the club. If there is some charge for the subscription, please let me know and I will send you the money. It will also be good to get the back issues.
Alfredo Buzali I., Tecamachalco, Mexico

Since Softalk *has done no advertising, we thank* Apple Cookbook *for their mention of us.*

We are currently working on the problems involved in mailing Softalk *to Apple owners in neighboring countries and overseas. We are most complimented by the demand for* Softalk *in places as widespread as Japan, France, Germany, England, Australia, Canada, and Mexico; we have even received a sign-up form from Pago Pago.* Softalk *is already available in retail stores in several of these countries.*

Mountain Man Likes Hardware
I have received the first two issues of *Softalk*. Congratulations! I think you have a hit. I live in the mountains of Northern California and do not have access to a dealer, so I'm unable to preview many programs. Your magazine has provided an enjoyable answer.

There is one thing that would really add to my enjoyment of your magazine. Being an electronics hobbyist, I'm interested in designing peripherals for the Apple II. Would it be possible to have a column devoted to construction projects?

Also, it would be interesting to know how the winners of the contests (especially "Talking Turkey") arrived at their answers.
Ken Loomis, Mount Shasta, CA

Too Many Chips
Wait! Don't take me off your mailing list! Your pub is great!

Also, how about comments on problems, in particular the $55 *DOS 3.3* package? I already have the chips (part of Pascal Language System), all I need is the software pieces, but Apple refuses to price just the programming. (Yes, I wrote them a letter. No reply!) So I have the choice of paying for chips I don't need, or "finding" the software. Pirate, you say! Well, who is the pirate—most—Apple or me? How about asking your readership—or maybe Apple—why they won't unbundle?
G. D. Gauck, Raleigh, NC

Softalk *uses a Language System and sympathizes with you.*

According to Rob Campbell, software product marketing manager at Apple Inc., the decision on how to package DOS 3.3 was difficult and long considered. Selling the chips separately would require separate packaging and boost the price of the chips. Yet packaging the chips with the software meant that Apple owners with Language Systems would find themselves overly in the chips.

Finally, taking the view that extra chips may always come in handy and that the worse situation would be the user arriving home from the store with 3.3. software sans chips, Apple decided to go with the combined package, pricing the software and throwing in the chips as a convenience. ■

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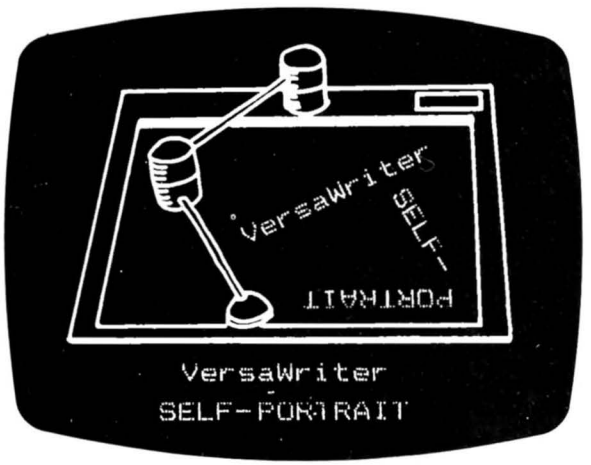

We have used the VersaWriter to draw a picture of itself. Text may be added in any size or direction.

VersaWriter

High-Resolution Color Graphics for Apple II or Apple II Plus

The VersaWriter graphics tablet lets you create multicolor graphics and drawings with your Apple computer. It compares in quality to graphic bit pads and digitizers costing three times more money.

VersaWriter is a digitizer and software package which presents a new approach to hi-res graphics. It consists of a mylar plotting board with a clear plastic overlay. Attached to this board is the drawing arm, which has a magnifying lens with a crosshairs at its end. You simply place any graph, picture or drawing (up to 8½" x 11") under the plastic overlay and "trace" it with the drawing arm. As you trace the drawing appears on the video screen.

The superior software of the VeraWriter enables you to do much more than just trace. Immediate commands include: color choice, brush size (the width of the drawing line), fill figure with color, draw a straight line between two points, use a different scale for drawing (.25 to 4), edit, erase, smothing factor (rounds off the rough edges as you draw), store picture on disk, and more.

One exceptional feature of the VersaWriter is the Shape Table function. You can take any picture, or portion of a picture, and store it as a shape table. Then the table can be recalled from memory and placed on any part of the screen. You can change the size of the image, rotate it, add to it, etc. By incorporating a series of images into a single shape table, commonly used symbols can be easily inserted into a variety of different programs. VersaWriter software includes an Electronic Drawing program which is a shape table of common schematic symbols-this program will give you a good idea of what the shape table can do, as well as let you easily produce electronic or logic diagrams.

Other programs included in the software are: the Textwriter, with which text can be added to graphics (UPPER & lower case, choice of color, text size, direction of text, starting point of text). Area/Distance-this program allows you to calculate distances (or perimeters) by establishing a measuring unit (of your choice) and tracing the shape or map route with the drawing arm. Areas of figures are calculated in the same way-this includes irregular and open figures. A very simple calibration program is also on this software disk.

A second software disk contains VersaWriter demonstration programs. For more advanced use of high-res graphics, there is a skeleton program which contains the guts of the VersaWriter. The VersaWriter is a sturdy peripheral device which plugs into the game paddles I/O port-the VersaWriter does not use up a card slot in the Apple computer. Also, the VersaWriter is not subject to the grounding problems and strong magnetic field problems of other, more expensive, hi-res graphic devices.

VersaWriter requires an Apple II with Applesoft in ROM (or an Apple II Plus), Disk, and a least 32K of memory.

VersaWriter comes complete with 8½" x 11" drawing surface, plastic overlay and two disks of software. Price $252.00 postpaid in continental USA. VersaWriter has a 90-day warranty on parts and labor.

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THE LOGICAL WAY

BY WILLIAM DEPEW

A Bit of Logic

In October, the Logical Way addressed the structure and elements of high-level languages. These languages are programs written in lower-level microprocessor languages. They are also called machine languages, because they are directly executed by the microprocessor chips.

The machine language instruction set directly reflects the hardware capabilities of the chip being used. Given the large number of chips in use today, one might expect great functional differences in their instruction sets. In fact, most of the differences are architectural—the amount of memory accessible, the number of internal memory registers, and other physical dimensions. Excluding these physical characteristics, the data functions performed are very similar from chip to chip.

The instruction set of a typical chip, such as the 6502, is divided into classes. First there is a data transfer group. These move data from register to register, memory to register, or register to memory. The data is not changed; therefore, no function is performed on the data. Second is the control group. This group includes jumps, subroutines, conditional branching, and other operations controlling program execution.

The final group comprises data functions. This group includes all operations that change data—that is, that perform some function on the data. This group represents the computing power of the chip.

The data functions of the 6502, and most other chips, are very simple. They include arithmetic operations such as add, subtract, increment and decrement, and shift left or right. Multiply and divide are seldom present in microprocessor instruction sets. Also included are logical operations.

The logic functions are always included, even when arithmetic operations are not. The logic functions are unique in several ways. They are the only data functions that operate on a single bit. The nature of the 6502 is such that data is transferred in groups of eight bits, each group constituting one byte. The 6502 logic functions reflect this by performing the function on all eight bits in parallel; yet each bit is independent of its neighbors.

The real importance of logic functions is that they are the root of all other functions. The digital computer would not be possible without them.

To introduce the logic functions, we'll use the logic symbols and state tables, or truth tables, familiar to the digital computer hardware designer. Fairly simple to understand, they are sufficiently common in computer literature to merit study and understanding.

Logic Symbols. The shape of the logic symbol identifies its function. Input enters at the wide end of the symbol and output exits through the narrow end. When several symbols are included in a logic diagram, the states are analyzed from the first inputs through each symbol to the outputs. The inputs and outputs of a logic diagram are often labeled with letters corresponding to a state table.

State Tables (Truth Tables). State tables identify the logic operation performed by showing the output states for each combination of input states. They do not show how the logic function is implemented; that is only done by logic diagrams. In most cases, the how is not as important as the what, particularly when the function is complicated.

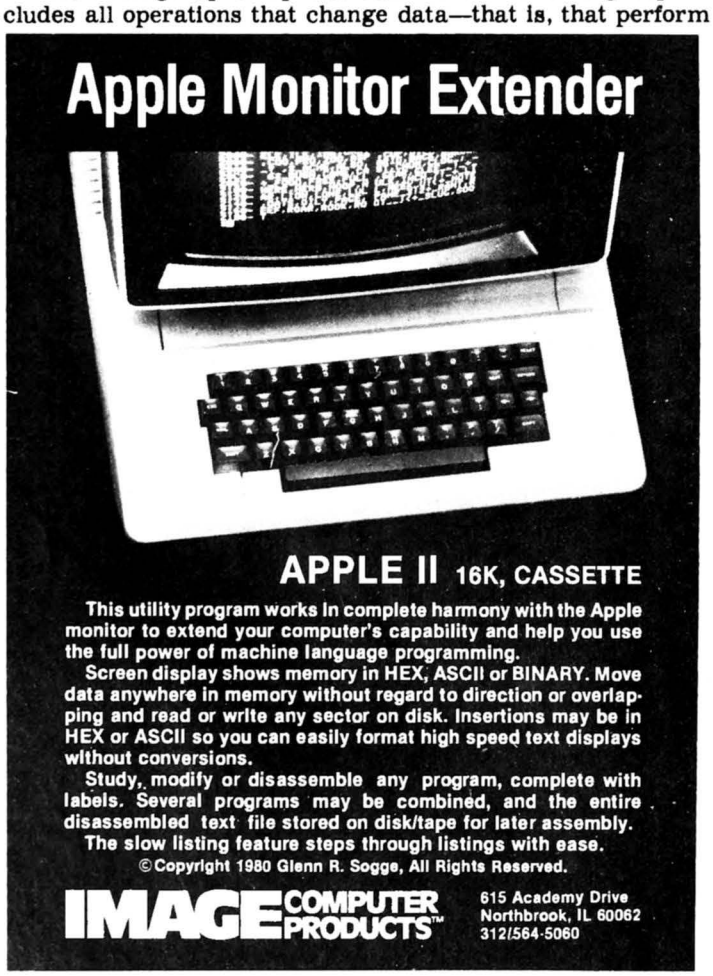
One-Bit Logic Operations. The simplest operations have one bit as input and one bit as output. The bits are binary digits, which can have one of two states. These states are often noted as 0 and 1, but can represent true or false, yes or no, on or off, or any two logical states. Figure 1 shows the state table for all possible one-input logic functions.

With one bit as input, two input states are possible: 0 and 1. For each input state, an output state is produced. These output states can have four unique combinations, which are the outputs of the four one-input logic functions. The state table shows the input as *I* and the output functions as 0 to 3.

Several characteristics appear in such a state table. First, if the table is folded over between functions 1 and 2, a pattern emerges. The output states for 0 and 1 are the exact opposite for those for 3 and 2. This observation leads to the definition of two classes of logic. The functions to the left of the fold are noninverting functions and those to the right are inverting functions. This simplifies the process, because we can analyze the noninverting function and realize that each has a similar but inverted sibling.

Input	Output Functions			
	0	1	2	3
0	0	0	1	1
1	0	1	0	1

Figure 1. State table for one-input functions.



Inputs		Noninverting Output Functions (0 to 7)							
I	J	0	1	2	3	4	5	6	7
0	0	0	0	0	0	0	0	0	0
0	1	0	0	0	0	1	1	1	1
1	0	0	0	1	1	0	0	1	1
1	1	0	1	0	1	0	1	0	1

Inputs		Inverting Output Functions (F to 8)							
I	J	F	E	D	C	B	A	9	8
0	0	1	1	1	1	1	1	1	1
0	1	1	1	1	1	0	0	0	0
1	0	1	1	0	0	1	1	0	0
1	1	1	0	1	0	1	0	1	0

Figure 2. State table for two-input functions.

Looking at function 0, we see that it produces a 0 regardless of the state of the input *I*. Not a very useful function! Sibling 3 is also useless, always producing a 1. This leaves functions 1 and 2.

Function 1 passes from the input state to the output unchanged. This function is called buffering. Although it may seem pointless, the buffer is important, not for its logic value but for its ability to transfer and isolate data electrically. You might consider the buffer as the logic function that allows data to be transferred from here to there in a digital system.

Its sibling, function 2, is very important. The inverting buffer flips the state of the input bit before transferring it to the output. The ability to invert or complement a bit is a requirement, along with addition, for performing the subtraction operation. Despite its importance, this function is excluded from the 6502 instruction set; instead, a sophisticated two-input logic function simulates the inverter as one of its operations.

Look ahead to parts *a* and *b* of figure 3 to see the logic symbols for the buffer and inverter. They are identical in shape, but the inverting buffer has a circle at the output. In the logic diagrams, the circle at the output identifies the logic symbol as belonging to the inverting class of logic.

Two-Bit Operations. Two-input logic is the real workhorse in digital systems, including 6502s. The logic functions have two bits as input and one bit as output. In the case of 6502 instructions, one bit comes from memory and the other from the accumulator register. The computer performs the operation and updates the accumulator with the output bit. With two input bits, four input states exist and sixteen output functions are possible. Figure 2 shows the state table for the two-input functions. Inputs are labeled as *I* and *J*; outputs are numbered from 0 to F, the hexadecimal digits for 0 to 15. For your convenience, the table has been flipped and separated into noninverting and inverting functions.

Let's examine the noninverting two-input functions. Function 0 always produces 0 and is useless. Functions 3 and 5 act as buffers for *I* and *J* respectively. Because these functions are dependent on only one of the two inputs, they have no value as two-input functions. This leaves us with five potentially useful functions. Of these, three are so useful that they've been honored with names. The names reflect the logic functions they perform. Function 1 is called *and*, 7 is *or*, and 6 is *exclusive-or*. These functions are included in the 6502 set as AND, ORA, and EOR. Let's look at the logic definitions.

"And" Logic. If all inputs (*I* and *J*) are 1, then the output is 1. In all other cases, the output is 0. The inverting version of *and* is called *nand* (not *I* and *J*). Figures 3*c* and 3*d* show the logic symbols for *and* and *nand*.

"Or" Logic. If any input (*I* or *J*) is 1, then the output is 1.

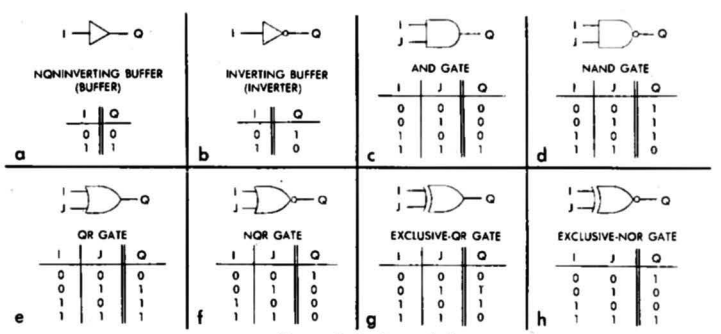
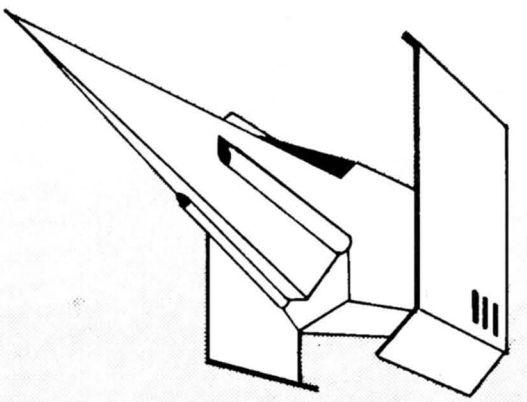


Figure 3. Logic symbols.



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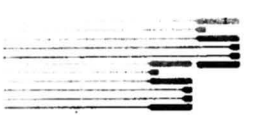

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THE LOGICAL WAY

Otherwise, the output is 0. The inverting version of *or* is *nor*. Figures 3*e* and 3*f* show the logic diagrams.

"Exclusive-Or" Logic. If the inputs have opposing states, the output is 1. When the inputs are of like state, the output is 0. The inverting version of *exclusive-or* is *exclusive-nor*. Figures 3*g* and 3*h* show the logic symbols.

Programmable One-Bit Logic. Using two-input logic, one input may be used for data while the other controls, or programs, one of two functions to be performed on the data bit. There is a unique pair of functions for each two-input function. Only one function in the pair is unique, however. All noninverting functions have buffering as one of their functions.

Clear/Buffer with "And." If 0 is presented at either input to the *and* function, 0 is always presented at the output. A 1 at the control input causes the data to be buffered to the output. This can be used to clear bits selectively. Consider a byte of eight bits. A mask byte is created with 0 in every bit position to be cleared to 0, with the other mask bits set to 1 to buffer the other bits. Then the mask byte is *and*ed with the data byte, clearing the desired bits.

Buffer/Set with "Or." If 1 is placed at either input of an *or* function, the output will always show 1. A 0 at one input buffers the other to the input. Similar to *and* masking, *or* masking is used to set bits selectively to 1.

Buffer/Invert with "Exclusive-Or" (EOR). The output for these functions always reflects the state of the data bit. A control bit of 0 selects buffering the data, and a control bit of 1 selects inverting the data. With EOR in the 6502 instruction set, there is no need for a complement instruction. The nature of *and* and *or* lead to an analogy. Consider a path running from the data input to the output. The control input represents a gate. When the gate input is in the buffer state, the gate is open, allowing traffic on the path. In the other case, the gate is closed, forcing a fixed state at the output. Although this analogy does not apply to the *exclusive-or* function, all the functions have earned the name "logic gates."

Making It All Work. Let's look at a software application using these logic gating functions. In Apple hi-res graphics, patterns of bits represent colors. All bits off are black, all on are white. Patterns of on and off produce other colors. Every bit that is on shows up on the video screen. If we want to draw the same shape in many different colors, we start with a white shape. This provides the detail of the shape. To get the color, the detail is *and*ed with a color mask. This has the effect of gating out the bits of detail not belonging in that color pattern. Since this is every other bit, we lose half the detail that would be in a white or black shape. The colored detail is then *or*ed with the existing data on the screen. This masks in the colored detail without affecting nondetail bits.

Exclusive-or allows patterns to be nondestructively drawn in the video area. In the previous case, the colored detail bits replace whatever was on the screen. Here the detail is *exclusive-or*ed with the screen, inverting the screen bits corresponding to the detail bits. The shape appears in this contrast. If the process is repeated, the shape is removed from the screen, leaving whatever was there before untouched. This happens because two inversions make a noninversion.

The Negative Approach. We've been neglecting the inverting functions *nand, nor,* and *exclusive-nor*. At the software level, these functions are not available, requiring us to create them by inverting the result of a noninverting function with EOR. To the hardware designer, the inverting nature of the functions has a special appeal. By inverting an inverter, we get a buffer. Inverting a *nand* results in an *and*, and so on. The common trait of inverting two-input logic gates is that inverters can be made from them. This is a bonanza to the hardware creator. By using one type of inverting logic gate and inverters made from that same type, any logic function can be realized. In figure 4, equivalent logic diagrams are given for

BY BILL BASHAM

NEW FOR THE APPLE

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DOGFIGHT will capture your imagination. You are the pilot of a jet going into combat. You may fly alone on this mission, or you may have another pilot flying with you to defeat the enemy. First you fly against one enemy jet. You are in complete control: fly faster or slower, turn left or right — but most importantly, FIRE. If you are shot down, and you act quickly, you can bail out. You and your parachute float gently downward, hoping an enemy plane does not shoot you. If you survive, you will quickly return to the fierce dogfight. The enemy can also bail out!! You must shoot him down before he has a chance to return.

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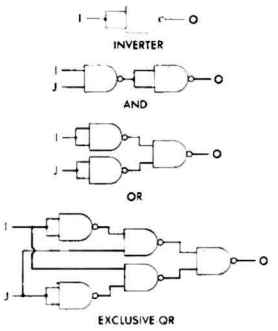


Figure 4. Equivalent logic diagrams using nands.

the inverter, *and, or,* and *exclusive-or* gates, built using only *nand* gates. As an exercise, you could re-create these using *nor* gates.

These logic gates are the only items needed to build just about any computer, apart from electrical characteristics. The 6502 is a very complicated grouping of these simple gates.

Arithmetic Primer. So far, we've discussed logical operations. Now we'll examine how these logic elements are combined to perform binary computer arithmetic—adding, subtracting, and shifting bits.

The rules for binary addition are actually simpler than those for decimal addition. Zero plus zero is zero. One plus zero is one. One plus one is zero and generates a carry to the next digit. Without the carry, the *exclusive-or* function is a binary adder. The carry bit is necessary for adding more than one binary digit. To deal with the carry bit, we need a two-stage adder. The first stage adds the two bits and, using an *and*-type gate, checks to see if both bits are 1. If so, a carry bit is generated to the next digit. The second stage adds the result of the first stage with the carry from the previous digit and generates a carry if both bits are 1. This circuit is shown in figure 5 as the *binary full adder*. By cascading these circuits, we can add two binary numbers of arbitrary length.

To subtract, a process called *two's complement addition* is used. In this process, the number to be subtracted is inverted (complemented), then one is added to it. This results in a two's complement number that is added to the other number, effecting a subtraction operation. For this reason, negative numbers are usually represented as two's complement numbers in digital systems.

The last of the 6502 arithmetic functions is shifting bits. Shift registers are used with addition to perform binary multiplication. If a decimal number, such as ten, is shifted to the left by one digit, the effect is the same as that of multiplying the number by the base of the number system. In decimal, the base is ten, and the value one hundred results from the shift. A shift to the right performs a similar division. By straight shifting, we can multiply or divide binary numbers by the powers of two. Also, looking at a decimal calculation such as six times three and seeing that it is the same as the product of four times three plus the product of two times three illustrates a general method to multiply binary numbers by adding the factors of the powers of two.

Hopefully, this evolutionary discussion has helped you grasp the logic behind machine languages that are simple in structure yet so flexible in application. Follow up by trying to build some logic functions and diagrams of your own. A good challenge might be to modify the binary full adder (figure 5) to perform subtraction via two's complement addition.

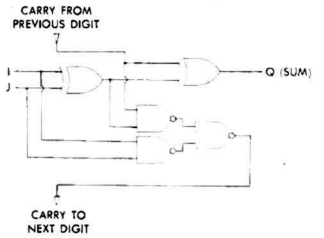
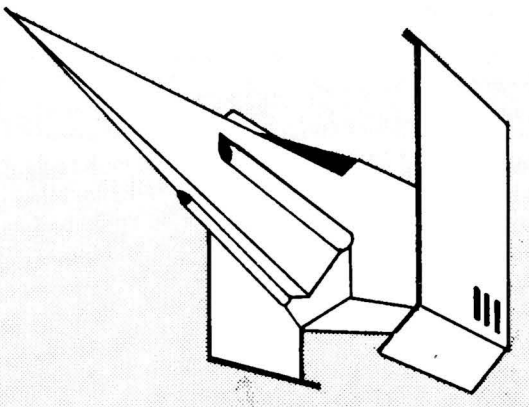


Figure 5. Binary full adder (I + J = Q).



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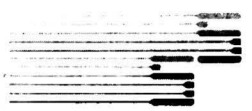

Sirius Software

1537 Howe Ave., Suite 106, Sacramento, CA 95825

MARKETALK Reviews

Applewriter Graphics. Apple Computer's *DOS Tool Kit* comes with twenty-two ready-made typefaces and a program that allows you to design even more. These are intended for use in programs and for display on your monitor. Apple also makes the Silentype printer, a neat and supersilent thermal printer with nice graphics dump capability. Yet another product of the prolific Apple company is the *Apple Writer* word processor, possibly the most convenient to use of all continuous-text word processors and definitely among the most powerful.

Computer Station has put these products together, along with the concept that you might want to combine their features, and has come up with *Applewriter Graphics*.

There appears to be very little on the *Applewriter Graphics* disk, and the instructions are brief. But the capacities this package gives you pack a wallop.

Using DOS 3.3's *Muffin* program, convert your *Apple Writer* to 3.3. Using *FID*, copy the programs on Computer Station's disk and your choices of typefaces from the *Tool Kit* onto the 3.3 *Apple Writer* disk. Boot the new disk and change the printer address to the one specified by *Applewriter Graphics*.

Next time you want to print a text file, select "Quit" on your *Apple Writer*. Run a new print file from the Computer Station software and choose your typeface. You'll find yourself automatically at the *Apple Writer* print menu. Continue as though you'd never left *Apple Writer*. But your Silentype will print your text in the typeface you chose.

It is so simple, so cleanly designed, that you'll soon forget you were ever without this capability.

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This package features 31 character account names, 6 digit account numbers, and 10 levels of subtotals for more detailed income statements and balance sheets. Up to 2000 entries can be processed per session.

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HEADLINE in OUTLINE FONT

A good face is Blippo Black.

This is how Applewriter Graphics looks in the Slant font.

Flowery purposes are well served by the GOTHIC font and lifestyle.

Care to venture a guess as to the derivation of Byte font's name?

Good Subhead: COLOSSAL

ʇoʞ ɟǝʞᴉuɯ ɟɥǝ ɟʇuoɯɹoɟ ɟo
ʞɹoʍ ɟɥᴉs ǝsɯbɹo oʇ
ɥqbɹǝɯʇᴉɟʇǝʞ ɓʍǝbuᴉoz
bʇᴉɯɟᴉɯd DOS ʇooɹ Kᴉɟ,ƨ
ɲbƨᴉɹɓs ɓomʍ ɟǝqǝ ʇoɯɟ' ʌoɯʞ
ʞǝɯǝɹbq ᴉz ɟɥǝ ƨǝɔʇuǝɟ ɯoʇq
ʌoɯ ʍǝǝq ɟo ǝɯɟǝʇ ɟɥᴉs
ʍoɯɟɥ,ƨ ɔoɯɟǝƨɟ' ʇɥǝ ƨǝɔʇuǝɟ
ɯoʇq ᴉz: ƨɥǝɯʇooʞ' Ǝʌolʌoɹ
ʌoɯɹǝsᴉʇ ǝɯq ɓooq ɾuoʞ ɯᴉɟɥ
ʌoɯʞ ʌǝɹɔǝƨ'

A couple of things are different about the special font printouts. One tremendous advantage is that almost all the regular typefaces have descenders—p, g, y, j, and q actually descend. In achieving this, speed was sacrificed. Each line of type is actually two printing passes: one direction captures the body of the letters, the return run captures the descenders. So printing time is doubled, assuming you were printing in the bidirectional mode to begin with.

Any fonts you wish to design using the *DOS Tool Kit* program may be printed by your Silentype via the *Applewriter Graphics* package.

Just for fun, you can print letters upside down or in mirror writing; and, should you be multilingual, the *Tool Kit*'s Cyrillic, Greek, and Katakana (Japanese) fonts can be printed, too. You even have access to Esperanto.

The *Applewriter Graphics* software can be used without the *Apple Writer*, but it's designed to make full use of that program's capabilities.

Computer Station offers similar packages designed to work with Paper Tigers and with the NEC Spinwriter; some of the Paper Tiger programs are for Pascal. MCT

Applewriter Graphics, Computer Station, Granite City, IL. DOS 3.3, DOS Tool Kit, Silentype. $34.95.

Dogfight. Bill Basham's elaborate arcade-type game may not make you feel like Eddie Rickenbacker annihilating the enemy in the heavens—but it comes close. Such a complete immersion could be achieved only with a player/pilot point of view format, but this would eliminate one of *Dogfight*'s fine features: a custom mode that sends you into a dizzying, whirling dervish of airborne conflict against as many as seven other players.

Like the Apple itself, *Dogfight* is versatile, permitting a solitaire approach, dual two-player modes—as enemies and as

friends (careless allies seem to be able to shoot each other down, despite the rulebook's declaration to the contrary), and the multiplayer custom mode.

In all cases, there is the enemy, without country, cause, or mercy, to contend with. As you survive each level, the action becomes faster and rival forces grow in numbers and dexterity, eventually adding helicopters to their arsenal. These Basham has successfully simulated, from the sluggish, unpredictable motion to the whirring rotary blades.

Hi-res animation represents planes as tiny jets. All but the computer's planes tow numerals for identification, the way advertising planes pull banners. Despite their utilitarian purpose, the numbers realistically simulate a towed object's motion according to the twists of the plane. Planes move in any pattern, including circles, with paddle or keyboard control.

Reality is suspended in only one aspect. If planes are shot down and, in the process of bailing out by parachute, their pilots avoid enemy fire, the fliers are instantly airborne once more and a bit rabid for revenge. Through sixteen levels of difficulty, you'll need all the luck you can get.

Dogfight's manufacturer, Micro Lab, will reward the first ten would-be Rickenbackers with a special achievement plaque for scoring ten thousand points. Watch for the secret code that flashes on screen—if you survive that long. RK

Dogfight by Bill Basham. Micro Lab, Highland Park, IL. 32K, disk. $29.95.

Akalabeth. By Lord British. Your adventure starts in a town somewhere on a twenty-one unit square map of the lands of Akalabeth. You can see one unit in each direction about you. You choose a lucky number, accept or reject a set of characteristics values, and decide whether you will travel as fighter or mage. Fighters cannot control magic amulets, but magi, who can, cannot use rapiers—the most powerful weapons—and bows.

Scant instructions give you the background of the adventure, which merely tells you why Lord British wishes the evil monsters of the dungeons destroyed, a description of the function of each characteristic, a key to items on the map, and a set of movement commands. All this takes three pages of large type—quite a contrast to the books of ins and outs that come with most simulation games.

Because of this, and because you may have difficulty getting beyond the upper dungeon level upon starting, you might decide there's very little to this game. You'd be wrong. *Akalabeth* is full of surprises, not only in the dungeons, but in the capabilities your character has. Persevere through the first few trials, and you'll find a game that not only challenges your strategy and resourcefulness but offers considerable depth. The dearth of instructions is intentional; it's assumed that the player will enjoy discovering these things by trial and error or careful thought.

Hi-res graphics are finely drawn and clean in the outline style. The game moves quickly with no time-consuming returns to the disk. Although a dungeon hole is the same each time you descend it—it could be mapped, but what a task—there are a dozen holes and each has a different layout and different characteristics. One small hint: in some dungeons, carrion crawlers appear on higher levels than gremlins; in others, gremlins first. You'll only understand the significance of this when first you lock horns with a cute little gremlin.

Besides the comprehensive care in design and attention to detail that characterize *Akalabeth*, subtle touches suggest the mysterious Lord British to be a person of droll wit and good nature. Incidentally, British apparently derives his pseudonym from the character in *Akalabeth* who doles out quests and confers knighthoods.

The only problem with the game is that it cannot be saved and resumed. Unless you have seven or eight hours at a stretch to spend on it or an Apple you can leave devoted to it for days at a time, don't try more than difficulty one of the ten available. Chances are, you'll soon be willing to devote a weekend to the higher levels anyway. MCT

Akalabeth by Lord British. California Pacific Computer Company, Davis, CA. Applesoft ROM, 48K, disk. $34.95. ◻

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Robot War strategy for learning

Modelled by Stan and Hank Capshaw.

BY MARY TAYLOR ROLLO

The robots take the battlefield, each tiny animated shape with a sole purpose: to destroy the others and reign as victor at war's end.

Two human spectators follow the battle closely. With rapt attention, they watch as the more intelligent robots map intricate patterns, scan, and parry. Both pairs of human eyes dart to the left of the monitor as Random, a one-dimensional demonstration robot, runs into a wall. Its totally random pattern gives it no means of detecting obstacles in its path; occasionally, it destroys itself through collision.

This time, Random will not destroy itself. Bottom, another demo whose limited movement confines it to the bottom of the battlefield, has caught Random in its relentless upward scan and it is shooting.

The spectators quickly lose interest in this skirmish as their attention is diverted by a sudden movement toward the center of the field. One of their own robots has been dealt a glancing blow from another demo, Square, a fast-moving robot whose pattern is its name, and who, fortunately, shoots only once at any robot he sees within the field and rapidly moves on.

The robots of the spectators have several dimensions, and the injured one, called Beowulf, recognizing its wound and peril, has scooted to a far corner of the field and begun a 270-degree scan, covering the entire field except the corner behind it.

JeanDark, the other spectator's robot, continues a small-area vigil of circling and scanning. Beowulf scans in fifteen-degree increments; if JeanDark's area is less than fifteen degrees wide and does not happen to fall across one of those lines of vision, Beowulf may never find it. With apprehension, Beowulf's creator realizes that this is probably the case.

His apprehension is well-founded. JeanDark has been designed to scan in seven-degree increments. In seven full-circle scans, it sees everything on the field.

As it happens, it only takes two circling scans for JeanDark to key in on Beowulf. Instantly, JeanDark fires. Beowulf's spectator unconsciously grips the arms of his chair. Will his plan II evasive action routine work? It would, but not fast enough. Before Beowulf has reached that subroutine, JeanDark fires again—another head-on hit.

Unfortunately, the new damage short-circuits Beowulf's intent and sends it back to its damage assessment loop. Once more JeanDark fires.

Recognizing his robot's weakness and its consequent inevitable defeat, Beowulf's spectator wishes only for the battle to end so he can take his robot back to the testbench, pinpoint the trouble in the assembly, and edit Beowulf's source code. He feigns disinterest, waiting for his companion's robot to finish Beowulf off.

It is not to be. Just then, Square has come around again, and JeanDark takes a direct hit. It gets one last shot off at Beowulf, assesses its damage and begins to move smartly. Square is long gone, but Random, having randomly located Bottom during Bottom's assault and thus having shot its way out of Bottom's line of fire, has wandered into JeanDark's territory.

JeanDark is concentrated on scanning for its lost prey; it doesn't notice Random until Random runs into it. Groping at random for a way out, Random bumps into JeanDark again. Both are damaged with each collision. Meanwhile, Beowulf has completed its escape cycle and has gotten away.

Working its way back and forth across the bottom, Bottom has again spotted Random; Beowulf, however, ensconced in its new position, has spotted Bottom. Shots fly furiously. Random succumbs. JeanDark, taking the shrapnel from Bottom's barrage of Random, finds a clear position and is scanning.

Bottom changes direction and attempts to scoot with each hit; it succeeds in escaping Beowulf, only to be sighted by JeanDark. JeanDark's fusillade is fast and unrelenting; Bottom is trapped by its need to change direction before scooting. Caught in its own loop, it is destroyed.

Only the spectators' robots and Square remain. Moving too swiftly to be caught by more than two of JeanDark's shots from across the board, Square, despite its single dimension, appears to have a good chance of winning. But it, too, has a fatal flaw: when it sights a robot in its path, rather than within

the field, it cuts a right angle at that point, modifying its square to a rectangle.

Now, Square is sighted by JeanDark—from the rear. It takes three shots before making its normal turn south; unfortunately, immediately in its path is Beowulf. Sighting Beowulf, Square turns again, directly into JeanDark's fire. It, too, is destroyed.

In the end, after several minor scuffles and much searching, the superior shooting cycle of JeanDark does prevail, to the great satisfaction of its creator.

Beowulf's creator immediately claims the Apple to examine his defeated robot's computer-brain program on the *Robot War* testbench. When he believes he has identified the specific bytes causing Beowulf's flaws, he will run the robot's source code on the built-in editor and reprogram the problem areas.

Learning Isn't Just Fun—It's Addictive. JeanDark's maker, Joe, now plays *Robot War* purely for fun; he has a stable of several robots he's programmed, each a variation or improvement on the others. JeanDark is his latest creation. This battle was a trial: he's hoping that, with JeanDark, he will finally be able to defeat his wife's robot, Ohjay.

Beowulf's creator, Moe, plays *Robot War* for a different reason. He's using it to learn to program. Three weeks ago, he knew the barest minimum about programming: enough to init a disk or to print a message on the screen. When he saw a friend's *Robot War*, he believed he could make a better robot.

Once he had his own *Robot War*, he was determined to learn to code his vision of a superrobot. Because the *Robot War* language uses labels and simple instructions, Moe found it quite easy to produce a working robot; but this was far from the valiant warrior he had in mind. He began to plan out the sequence of commands a better robot would have to follow. Thus bloomed the seeds of logical programming thinking.

Moe Applied Methods to Applesoft. Now Moe finds himself thinking of ways to computerize various aspects of his work and hobby; he knows how to break the tasks into steps, and he recognizes how the steps should work. He turns to the *Applesoft Tutorial* with a specific requirement in mind and learns the applicable sequence of commands in that language.

A graphic artist by profession, he is working on a program that will automatically wrap type from a text file around an illustration, given only the height, width, and name of the shape of the illustration. Later, he will refine the program to wrap around complex shapes.

Moe still does not know all the commands in Applesoft; some he has not found a need for yet. But he is confident that he can write any program he can conceive, and write it in any computer language, given access to the commands.

JeanDark's maker had studied the *Applesoft* and *Integer Basic Tutorials*, had successfully input and run all the example programs, before he began playing *Robot War*. But, having finished the books, he found himself in command of a lot of commands, but with no clear idea of how to apply them to a program for his own purposes. He did not know how to look at a task in such a way as to break it down into its step-by-step programmable parts.

Had To Learn Logical Thinking To Play. When Joe received *Robot War* as a present, he leaped right into programming a robot. Shunning the testbench in his eagerness to see his first robot run, Joe sent it directly to the battlefield, pitted against the simplest demos, Target, who is exactly that and no more, and Scanner, who shoots when its scan reveals another robot, but who never moves.

Joe's robot moved—directly into a wall; seemingly determined to leave the field of battle, it rappelled itself down the side wall, increasing its damage with each collision, until it reached the bottom corner of the battlefield. There it proceeded to bang its head against the wall until it was destroyed.

Joe was aghast. He took his robot back to the source code editor and put in a lot of new commands and loops. This time the robot scanned and shot for a while before it began hitting the wall. But even while it was working, it was so slow that its target—unless it was Target—was long gone before Joe's robot got his shot off.

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Again, Joe edited new commands into the source code, but the new edition never made it to the battlefield. When he tried to assemble the edited robot, the assembler announced that he was well over the 256 two-word assembled lines allowed by a robot computer-brain.

Testbench Led To Understanding Programming. Finally, Joe decided to try the testbench. There, he could see his assembled robot program run line by line. He watched his robot go into a move loop that looped before it got to the conditional exit command. He could simulate damage and see that subroutine work—or not. He could simulate radar sightings and count how many instructions his robot needed to respond to before it actually shot.

As he worked on fixing these problems, Joe was forced to break his thinking into small steps. He became aware of details that had escaped him before. Without realizing what was happening to him, he began to think in programming logic.

When his robot continued to snag in the assembly because of its length, Joe learned to use the robot's twenty-four memory registers for storing values and to use arithmetic to consolidate commands to the nine input/output registers. Joe's ability to think logically increased by the power to think economically.

Several months later, Joe considers himself a good programmer in Applesoft, as well as an expert in *Robot War* code. He has just begun dabbling in assembly language and finds that his experience with the assembler and testbench in *Robot War* has given him a headstart in understanding the processes involved.

Joe's only remaining frustrations are at home. One, his wife's superior robot, he hopes to defeat tonight with Jean-Dark. The other, he has surrendered to: his twelve-year-old daughter's robot Chewbacca. Chewbacca has lost only once and has achieved the maximum 250 points.

No Fantasy—Robot War Is a Real Program. In February, *Robot War* will be available in retail stores. The program this article describes is real and, although the narrative of Joe and Moe is fictitious, it is based on *Softalk*'s real experiences in test-playing a preliminary copy. You program your own robots for battle in what is perhaps the most strategy-filled game yet devised. And you can learn or improve your programming skills at the same time.

Robot War was designed by Silas Warner for MUSE Software; it's source code editor is a mini *SuperText,* which, as a side effect, makes learning to edit the real *SuperText* a snap. The assembled code can be printed out and studied; at this writing, source code cannot be printed, although people with the actual *SuperText* can capture the file on it and print it from that program.

This game that uses strategy gaming to teach programming is designed to be used in schools as well as by individual users. If a spoonful of sugar really makes the medicine go down, *Robot War* is a perfect teaching vehicle. Once you feel the challenge to have a robot to compete, you'll feel a compelling desire to learn the coding. A compelling desire to learn anything is hard to come by. *Robot War* has it built-in.

One National Tournament Coming Up. To follow shortly after the release of *Robot War*, MUSE plans to sponsor a nationwide tournament of user-made robots. Preliminary play will be conducted on a local level, playoffs will be regional, and the final championship battle will take place near MUSE in Baltimore, Maryland. Prizes, rules, and local centers for play will be announced at a later date. MUSE is immediately looking for test players; contact the company if interested. ◨

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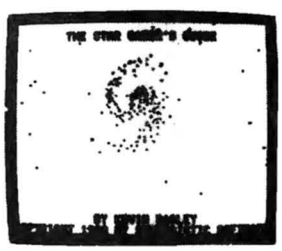

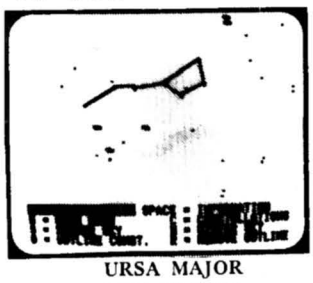

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TRADETALK

☐ **Strategic Simulations** is the latest software publisher to outgrow its facilities. President **Joel Billings** announced the move from Palo Alto to new quarters at 465 Fairchild Drive, #108, Mountain View, California 94043. "We started with one office in our old building and had expanded first to a second office and then to a third. Finally, we realized we'd have to move to a building with significantly more space." The Mountain View facility doubles the area available to the company. When the lease was taken, that seemed sufficient; but Billings now warily reports, "We just fit in comfortably; more growth will cramp us sooner than I expected." More growth appears to be in the offing; Billings projects four new products for the first quarter of this year.

☐ **Hayden Publishing Company** (Rochelle Park, NJ) has announced the acquisition of two publications, *Personal Computing* and *Minicomputer News*. President **James S. Mulholland** looks upon the buys as "logical extensions of Hayden's current publishing efforts." **Jules Gilder,** author of some of Hayden's more valuable math routine programs for the Apple, is assuming the position of editor of *Personal Computing*, effective with this month's issue.

☐ Another publishing company in the news is **Creative Computing**, the Morristown, New Jersey, magazine and software publisher. They've moved into a new building of their own construction. No, management of the firm didn't succumb to the edifice complex; they had operations scattered among several locations and finally decided to consolidate all operations under one roof. The best way was to build their own. Mailing address for the various entities of the miniconglomerate remains the same.

☐ Also finding it more practical to erect its own building was **Integral Data Systems, Inc.**, maker of the Paper Tiger line of printers. IDS left Massachusetts for forty-six forested acres of land in Milford, New Hampshire. Their new, two-story building was designed to be compatible with the environment and was constructed with elevators and other amenities to enable employment of the handicapped. Facility also has a jogging trail, locker rooms, and a skating pond.

☐ The exploding interest in **Apple Computer Inc.**'s initial public offering, sold over the counter, has ignited a dramatic upsurge in the per-share price. Originally set at a range of $14 to $17, the price level rose to the $22 level forty-eight hours before the stock went public on Friday, December 12.

Then, the results of oversubscription bore fruit: three hours after its opening, Apple's price had soared to $29. As this *Softalk* goes to press, there hasn't been a noticeable abatement in Apple's stellar opening day performance, with buyers gobbling up all shares as soon as they become available.

☐ **Southwestern Data Systems** initiates a new approach to familiarizing retailers with new software this month. Through the project, called *The Courier*, disks comprised of programs demonstrating new releases from software publishers subscribing to the service, along with supporting literature, will be mailed every four months to every Apple dealer in the United States and Canada. The goal is to help dealers build a library of software that they can demonstrate for customers or use for reference. Costs are shared among participants. ◨

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Assembly Lines

BY ROGER WAGNER

Every Person's Guide to Assembly Language, Part 4

As a preface, I'd like to offer a few of my own programming philosophies. Writing programs to do a given task is essentially an exercise in problem solving. Problem solving is in fact a subject of itself, and I hope to be able to spend a little space in a future issue on just this topic. For now, though, a few previews and helpful hints. No matter what your programming goal is, it will always involve solving some particular aspect that, at that moment, you don't really know how to solve. The most important part is that, if you keep at it, you eventually will get the solution.

One of the key elements in this process, I believe, and the particular point I will stress now, is that it is important to be a "tool user." Programming in any language consists of using the various commands and functions available to you in that language, and putting them all together in a more complex and functioning unit. If you are not familiar with the options you have at any given moment, that is, your *tools*, the problem-solving process is immensely more difficult.

My intent in this series is to present in an organized way the various operations available in assembly language and how they can be combined to accomplish simple objectives. The more familiar you are with these elements, the easier it will be to solve a particular programming problem.

You may wish to keep your own list of the mnemonics and their functions as we go along. Such lists are already available to you in books and even in your Apple reference manuals, but I think you'll agree that by taking the time to write each one down as you learn it, along with your own personal explanation of what it does, you will create a much stronger image in your mind of that particular operation.

Now on to the project at hand.

Commands Covered So Far:

JSR	LDA	LDX	LDY
RTS	STA	STX	STY

This month we start to get into not only more mnemonics, but the techniques of using them to accomplish various overall operations. In particular, we'll look at counters and loops in assembly language. In Basic, the FOR-NEXT loop is one of the more essential parts of many programs, and this is no less true in machine programming. The only difference is how the loop/counter combination is actually carried out.

In Basic, the testing of counters is done either by IF-THEN statements or, automatically, in the NEXT statement of the FOR-NEXT loop. In assembly language, the testing is done by examining various flags that indicate the status of the various registers and memory locations. The flags for these operations are located in the status register. This is a fourth register of the 6502, which we have not previously mentioned.

Like the other three registers—accumulator, X, and Y—the status register holds a single byte. You'll recall that each byte in the Apple can have a value from 0 to 255 ($00 to $FF).

As it happens, there are many ways of looking at and interpreting numbers. The one of common experience is that in which we consider only the magnitude of the number. Noticing that 255 is larger than 128 gives us essentially three kinds of relationships and, therefore, information: a number is either less than, equal to, or greater than another number.

The second way of looking at numbers allows us to see a much greater degree of information in a number and, hence, is that much more useful. This involves the idea that a single byte can be represented not in the usual way of $00 to $FF but, rather, in a *base two* or *binary* representation, in which the number 133 would be written as: 10000101. In this case, each 1 or 0 represents the presence or absence of a given condition. Thus, eight distinct pieces of information are conveyed, as well as all the various combinations possible.

Before you run shrieking from the room, remember that this is all done to make things *easier*, not harder. Besides, learning base sixteen (hex) wasn't that bad back at the beginning of this series, was it? So let's take a moment to see what all this bits and bytes stuff is all about.

Binary Numbers. The Apple is an electronic device and, actually, in many ways, a simple one at that. In most parts of its circuitry, the current is either off or on. That's it. No in-between. That's where base two comes in. The idea of a number base has to do with how many symbols, or units, you use for counting. We normally use ten. We have a total of ten possible symbols to write in a single position before we have to start doubling up and using two positions to represent a number. You'll recall in hex that, by using 0 through 9 and A through F, we had sixteen possibilities; thus, we were in base 16. With the on/off nature of the Apple, we're limited to 0 or 1.

How high can we count in one position? Not very. We start at 0, then go to 1, and that's it. Then we have to add another position. The next number, therefore, is 10. As before, remember that, in this case, 10 represents what we usually call 2. If we allow three positions, the highest number is 100 (representing the quantity four in base ten).

There are patterns to both the first and the highest decimal number you can represent in a given number of positions in a given base. In base two, the highest number you can represent by a given number of positions found using the formula

$$N = 2^n - 1$$

where N is the largest number and n is the number of positions available. For $n = 3$, the highest number is 7, or 111 in binary.

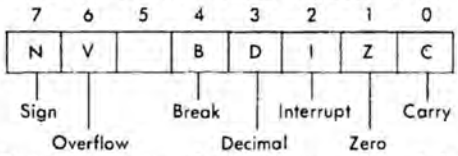
In base two, the first number in a given number of positions is found by using the formula

$$N = 2^{n-1}$$

where N is the first number in a given number of positions and n is the number of positions available. For $n = 3$, N becomes 4, which is the decimal number equivalent to 100 in binary.

By using eight positions, we can go up to 11111111, which just happens to equal 255. How handy! This is the same maximum value as our bytes. And, if the truth be known, it's actually the other way around. We use the numbers 0 through 255 because we are using eight bits to make up each byte. Whether each bit is a 0 or a 1 depends on whether the part of the circuit that is responsible for that bit is off or on.

The Status Register. Here at last is our representation of a single byte, made up of eight bits. In particular, the byte we are looking at is the status register of the 6502.



The bits are numbered from right to left, with bit zero often being called the least significant bit and bit seven the most significant. Each bit in this register indicates the status and/or results of different operations and is called a flag. It is by the use of this register that we can create counters and loops in our programs. The flag we will be immediately concerned with is bit one, the zero flag. In terms of the commands we already know, the zero bit is affected by an LDA, LDX, or LDY.

If the value loaded into the accumulator, X register, or Y register were 00, the flag would be set to 1. If it were a nonzero number, the flag would be 0. Seemingly backward perhaps, but remember, each flag is set to show the presence or absence of a given condition, in this case, $00.

Incrementing and Decrementing. To create a counter and then a loop, we will use the status register to tell when a given register or memory location reaches zero. We will also need a way of changing the value of the counter in a regular fashion. In the 6502, this is done by incrementing or decrementing by one each time, as indicated.

	Accumulator	X-Reg	Y-Reg	Mem. Loc.
Increment by 1	Not Avail.	INX	INY	INC
Decrement by 1	Not Avail.	DEX	DEY	DEC

In the first row are the mnemonics for the commands to increment the given location by 1. The second row shows the corresponding commands to decrement each location.

Note that directly incrementing or decrementing the accumulator is not possible. Each of these commands affects the zero flag, depending on whether the result of the operation is zero or not.

The usual syntax for using these commands in an assembly listing is:

```
10  INX
11  INY
12  DEX
13  DEY
14  INC  $0600
15  DEC  $AA53
```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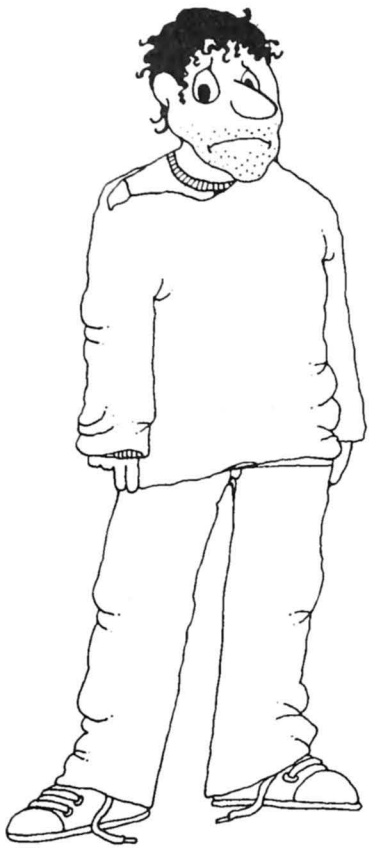

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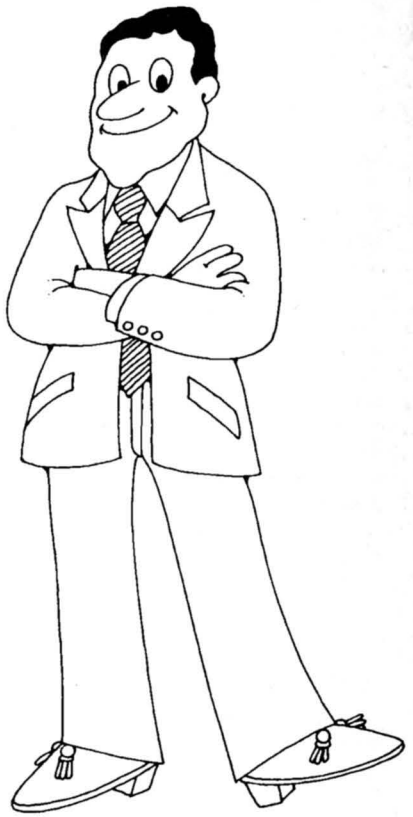

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For the register operations, the command stands alone, with no need of an operand. In the case of INC and DEC, the memory locations to be operated on are given, in hex, of course, usually preceded by the dollar sign.

One thing to mention here is the wrap-around nature of the operations. To understand this, examine the following chart:

Original Contents	Increment	Decrement	Z Flag set?	Z
$05	$06	$04	no, no	0, 0
$0F	$10	$0E	no, no	0, 0
$01	$02	$00	no, yes	0, 1
$FF	$00	$FE	yes, no	1, 0
$00	$01	$FF	no, no	0, 0

The effects of incrementing and decrementing different values are shown, along with the effects on the zero flag after the operations. The first case is simple, 5 + 1 = 6, 5 — 1 = 4. In both cases, the result is nonzero, so the zero flag is not set. For $0F, the same holds true. Remember that, in hex, the next number after $0F is $10. In the case of $01, incrementing produces $02. When we decrement, since the result is $00, the zero flag is set.

Here's where it gets interesting. When the starting value is $FF, adding 1 would normally give $100. However, since a single byte only has a range of $00 to $FF, the 1 is ignored, and the value becomes $00. This sets the zero flag. In the case of decrementing, $FF − 1 = $FE, so the zero flag is not set.

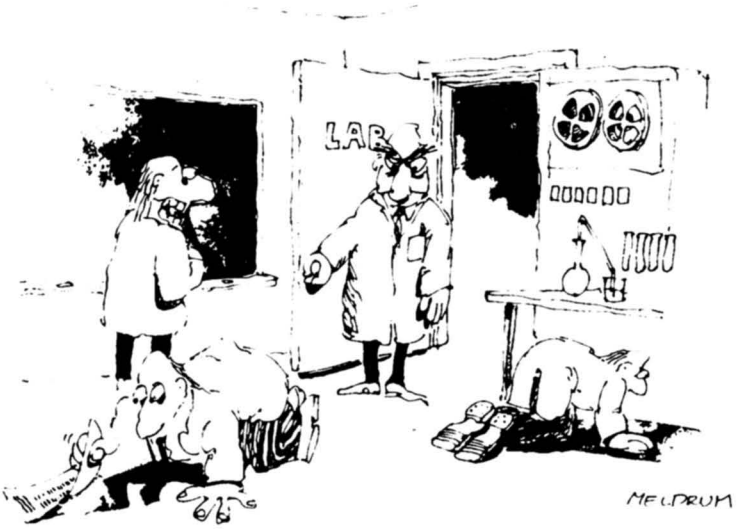
If we start with $00, although incrementing produces the expected $01, decrementing wraps around in the reverse of the previous case, giving $FF. Since both results are nonzero, Z—short for the zero flag—is clear, not set, for both operations.

Counters and Loops. The only procedure remaining to enable you to create a loop is a way of testing the Z flag and then being able to get back to the top of the loop for another pass. In Basic, a simple loop might look like this:

```
10  HOME
20  X = 255
30  PRINT X
40  X = X - 1
50  IF X <> 0 THEN GOTO 30
60  END
```

In this program, we start with the counter X set at 255. Then the value is printed, decremented, and the process repeated until the counter reaches zero. We can make the loop execute any number of times by properly setting the initial value of X.

In machine code, the test and GOTO is done with a branch instruction. In this case, the one we'll use first is BNE. Here is the assembly language equivalent of the Basic listing:



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Meldrum The Bulletin Sydney reprinted from World Press Review September 1980

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By Roger Wagner

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Softalk's First Annual

Enthusiasm for *Softalk*'s Top Thirty Bestseller list has grown more than anyone anticipated; but there's another side to the disk. Several *Softalk* readers have asked for the opportunity to present a bestseller list of their own—which really means a most popular list.

So here it is: *Softalk*'s First Annual Most Popular Programs of the Year election—except that this premiere poll will cover more than a year. It will cover all software published prior to January 1, 1981.

The author and publisher of the Most Popular Program will be presented with a *Softalk* Award.

Use your ballot, or a facsimile of it, to vote for your ten all-time favorite programs. Fill in your name and address, and be sure to include your zip code.

Only one ballot will be accepted per Apple user; that means that a family-owned Apple might generate four or five ballots—one from each member of the family; where there are two ballots from one person, only one will be counted if the choices are the same, and neither will be counted if they differ.

There are no rules against including your comments. If you want to tell why you like one program and not another, do it. We'll pass on a compilation of your comments and ideas to software publishers.

Your ballot must reach *Softalk* by February 16, in time for results to be published in the April issue of *Softalk*.

Now, pull up your Apple and begin reminiscing about all the software you've enjoyed. ◨

Assembly Lines

```
 1  ****************
 2  * LOOP PROG. #1
 3  ****************
 4  *
 5     OBJ $300
 6     ORG $300
 7  HOME EQU $FC58
 8  *
 9  START JSR HOME
10     LDX #$FF
11  LOOP STX $700
12     DEX
13     BNE LOOP
14  END RTS
```

And here is the way Apple's disassembler would show it:

```
*300L

0300-   20 58 FC      JSR   $FC58
0303-   A2 FF         LDX   #$FF
0305-   8E 00 07      STX   $0700
0308-   CA            DEX
0309-   d0 FA         BNE   $0305
030B-   60            RTS
```

In this program, we first do a JSR to the clear screen routine in the Monitor that we used last month. Then we load the X register with a starting value of $FF. Now we start the loop. Storing the X register at $700 will make the loop's action visible as a character on the screen for each pass through the loop. Next, DEX subtracts 1 from the current value of the X register. The BNE will then continue the loop back up to LOOP until the X register reaches $00, at which point the test will fail,

Most Popular Software Poll

Official Ballot

Vote for your ten top favorite programs ever of any kind. Arrange the programs from one to ten with your favorite first and runners-up following in order of preference.

1. _____ 6. _____
2. _____ 7. _____
3. _____ 8. _____
4. _____ 9. _____
5. _____ 10. _____

Mail this ballot or a facsimile to Softalk Election, 10432 Burbank Boulevard, North Hollywood, CA 91601, before February 16, 1980.

Name: _____

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and program execution will fall through to the RTS to the end of the program.

Try entering this now, and also notice how fast the program runs. You probably weren't able to see very much, but all 255 values were put to the screen. The inverse A that's left on the screen is how a $01 at $700 appears. ($00 doesn't get printed—why?)

To verify that each pass is being executed, replace the STX $700 in the source listing with a JSR $FBDD. If you don't want to hear 255 beeps, try changing the initial value of the X register in line 10. As before, you should be able to call this program from the Monitor with a 300G, or from Basic with a CALL 768.

You may also wish to try the equivalent version of the program, using the Y register or a memory location as the counter. I would also suggest trying to write a program using INC, INX, or INY to drive the counter as a practice program.

If you have any comments or suggestions for things you would like to see in this series, write to me, care of *Softalk*.

Next month, we'll fill in the use of the branch instructions and with that, have enough knowledge to write a good many interesting programs! Until then, Happy Appling!

Correction to December 1980 Issue, Page 14

In the December installment of the Assembly Lines series, the source listing for the assembly language program, lines 6 and 7, were listed as:

```
6  OBJ EQU $300
7  ORG EQU $300
```

In actuality, the EQU is only needed in most assemblers when defining *variable* and not when defining the OBJect and ORiGin locations. These lines should have read:

```
6  OBJ $300
7  ORG $300
```

My apologies for any problems this may have caused.

RW

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MARKETALK News

☐ **Multi-Media Video** (Santa Clara, CA) offers a bilingual Apple II system. Called *Arapple*, system in Arabic language is designed for Arab world and has extensive peripheral support, including the *Arabprint 160* ($4,200). Software includes Arabic English video dictionary, voice data input device called *Arabic Speechlink*, bilingual graphics tablet, business programs for accounting, inventory, scheduling, data base management; cash register system; education programs for basic and advanced math, statistical analysis, medicine and general survey of Arab countries; and Videomax game series specifically designed for Arab users. Of particular note is bilingual adaptation of NESTAR's Cluster One Model A system through which 65 Arapples can interface in a single network. The Arapple alone is $2,850.

☐ **Strategic Simulations** (Mountain View, CA) offers a two-in-one package in its wargame tradition. *Computer Conflict*'s duo represent the minigame genre, compared to Strategic's other sagas: each game is brief in play time and relatively simple to learn. Strategy is not simple though, and repeat play reveals much depth. *Rebel Force* by Roger Keating is a solitaire game; *Red Attack* by Jim Yarbrough is for two players—but you can take both sides. ROM Applesoft, 48K, disk. $39.95.

☐ *Hi-Res Adventure #1: Mission Asteroid* takes its number from its intended level of difficulty, according to **On-Line Systems** (Coarsegold, CA). Less expensive to serve as an introduction to hi-res adventures, *Mission Asteroid* includes methodology hints in the course of play. It also includes the best graphics yet from the company and a delightful adventure—even for veterans—in attempting to save the earth from an asteroid within a time limit. By Ken and Roberta Williams. 48K, disk. $19.95.

☐ Leighton Paul (**Telephone Software Connection**, Torrance, CA) offers *Double DOS*. This program loads into the top of your Apple's memory, slightly lowering HIMEM, and stays there as long as you don't clobber it with programs that require full memory. While it's there, you can switch from DOS 3.3 to 3.2 and vice versa at will and as often as you wish, merely by a call or, from Applesoft, an ampersand. 48K, disk, DOS 3.2 and 3.3, Apple's Muffin program. $18.

☐ **Sybex** (Berkeley, CA) announces the latest book by Rodnay Zaks, *Introduction to Pascal*. Though intended as beginners' tutorial to UCSD and Standard Pascals, the volume includes advanced level material. Paperback. $12.95.

☐ **Microsoft** (Bellevue, WA) announces *Olympic Decathlon*, a game based on a decathlon athletic competition. The decathlon encompasses ten events in all of which each entrant must compete. Points are awarded in each event and cumulative scores of the competitors determine order of finish. It is considered one of the most difficult and gruelling of all Olympic events. Microsoft's game includes all ten events: 100-meter dash, long jump, pole vault, discus throw, shot put, 400-meter dash, 110-meter hurdles, 1,500-meter run, high jump, and javelin throw. Keyboard keys control an animated hires figure on the screen. As many as eight players can compete for a gold medal. Points are awarded for each event according to how each performance rates against world champion standards. Requires 32K. $24.95.

☐ Hot off of Microsoft's hardware press is their 16K *RAMCard*, which increases Apple's RAM capacity to 64K. Compatible with the SoftCard, but can't be used simultaneously with the Apple Language Card. $195.

☐ Backup *VisiCalcs* are available from **Personal Software** (Sunnyvale, CA) for original owners of *VisiCalcs* whose warranty cards are on file at that company or who can show proof of purchase. $30.

☐ *Superclock II* (**West Side Electronics,** Chatsworth, CA), a real-time clock, combines time of day and calendar features with powerful interrupt capabilities. Extremely easy to use, *Superclock* offers four software-controlled interrupts from one msec to one hour, plus an *Appleclock* emulation mode that makes it compatible with existing software. Works with both Basics and Pascal. Battery included. $159.

☐ **Arizona Computer Systems** (Jerome, AZ) announces the *Pascal Database*. Program offers unlimited applications for such diverse data as mailing lists, personal business accounting, inventory, job estimates, sales analysis, and property management. Clear screen instructions enable even the novice to operate

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☐ Small but fast-growing, *Peelings II* offers extensive and thoughtful reviews of Apple II software. Reviews-only format results in abundance of information; rating system makes it easy to digest. Coverage of seven major Apple word processors and educational and business software are current features, in addition to general reviews. Available in computer stores at $2.50 per issue, or by subscription, $15 per year—less for longer.

☐ Turn your IBM Selectric into a printer for your Apple with the *EP-104 Selectric Conversion System* from **Escon Products** (San Ramon, CA). Coupled with a Selectric I, II, or III, the EP-104, a single-board computer, will not affect manual operation of the typewriter. Features include buffer hold, backspace, tab control, form-feed, and bell output. Also has 96-character buffer for incoming character storage. $575.

☐ *Space War 1* (**Galaxy**, San Diego, CA) is a strategy game in which one or two players have complete control of their space fleet tactical maneuvers. Hi-res with sounds of war. Each player builds his starting fleet and adds to it during the game. Allocating energy among fleet and among functions on each ship is crucial. Move throughout universe within sector or through hyperspace. Use short-range and long-range sensors, move and attack simultaneously. 48K, ROM Applesoft, disk. $39.95.

☐ **Hartley Software** (Kentwood, MI) offers an extensive line of educational software. Developed by a veteran classroom teacher and a professional programmer, all Hartley software is classroom tested. All programs require 48K, Applesoft in ROM, and disk. Priced from $15 to $80.

☐ **Charles Mann & Associates** (Yucca Valley, CA) has released a *Dental Office Management* package, which provides for appointment scheduling, patient checkup followup, private patient billing, and insurance form preparation. System maintains patients' general information files, prints daily schedules, keeps track of all daily payments and charges, and prepares daily activity summaries, as well. Designed to be operated by receptionist or accounts secretary, system is menu driven with its own assistance element. Remodel element allows customization for individual offices without programming knowledge. Until January 30, 1981, $359.95.

☐ The **TecLar** (Placerville, CA) computer interactive videotape enables anyone to use color broadcast quality videotapes to illustrate educational material. Instructional programs are individualized and self-paced. Electronic interface between the videotape player and the computer enables the user to quiz self on important segments of the videotape and arbitrarily select any portion of the program for review.

☐ The *Model 460 Paper Tiger* (**Integral Data Systems,** Milford, NH) uses a ballistic print head with nine staggered wires to present correspondence quality characters at throughput speeds up to 150 characters per second. Packs several high cost features in a precision printer; *DotPlot* graphics capability. $1,295.

☐ **Program Protection** (Mission Viejo, CA) offers a program protection service for programmers and software publishers. Free trial available if you send program and a blank disk. Company will send back program on disk, protected. Service, $100 plus $.50 per disk sold.

☐ The *Model 7424 Calendar/Clock Module* is **California Computer Systems** contribution to time-keeping on the Apple. Clock includes three separate, jumper-selectable driver programs, plus space for user-written drivers, onboard in 1K of EPROM. One driver transfers data and time in Mountain Computer format to Apple's input buffer; another uses interrupts to write correct time into an Applesoft string from which it may be called by software; third driver uses interrupts to maintain correct time on CRT screen. Because data is addressed one decimal digit at a time, programmer has complete freedom of data format. $125.

☐ **Southwestern Data Systems** (Santee, CA) is releasing Bill Blue's communications package, *ASCII Express II.* Blue, author of ABBS system, has created a high-speed medium through which files can be sent back and forth between Apples that are hooked up with Hayes Micromodem II or a communications card (sans automatic dialing). 20K buffer provides ample room for files; rapid editing is possible with line editor. Expansive user features include upper/lower case and unusual characters, transfer routines, compressing of files, macrocommands that define dual keystrokes as complete strings. $64.95, 48K, disk.

☐ **Micro Data Base Systems** (Lafayette, IN) has released a utility for their hierarchical data base management program. The *Schema Redesign System* modifies existing data base structure, allowing user to add and rename fields and expand data base size. $150. The *Dynamic Restructuring System* functions similarly for a large network data base. $300.

☐ Checkbook headaches can be a thing of the past with *Check-Mate* by **The Computer Emporium** (Des Moines, IA). Rapid edit, search, and sort; bank statement reconciliation and an archive system for a year's checks. $59.95. ❑■

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DEALER INQUIRIES INVITED

BY ALLAN TOMMERVIK

One of the joys of being involved on the ground floor of a booming industry such as the personal computer industry is watching the growth of the various enterprises. For the most part, the nascent stage of an industry is typified by good news—dynamic entrepreneurs entering the industry and growth and new products on all sides. The infrastructure of a new industry presents a dramatically different picture than television newscasts and newspaper front pages, which are almost always dedicated to bringing us the bad news.

Enthusiasm of Youth. The people involved in forging a new industry are usually more interesting and dynamic, as a generalization, than those in more mature industries where an entrenched bureaucracy has taken hold. This is no less true at Apple Computer Inc. itself than at the various small satellite companies that service the Apple industry with software and peripherals.

Talk to anyone at Apple and you'll sense an esprit de corps absent in most companies of that size. Most laborers in the orchard share a sense of pioneering enthusiasm about their industry and their product that make them more open to ideas and suggestions and less closed about the past, present, and future than their counterparts in, for example, the ball bearing industry.

One significant outgrowth of having such an enthusiastic and loyal employee base is that as the company grows and expands, and as it transfers some of its management people to other locations, that enthusiasm is spread throughout the country. It is reassuring to note that enthusiasm, high morale, and loyalty are as easily carried and transferred as the latest version of the flu.

One main area of expansion for Apple in the past few months has been the opening of regional service centers to address maintenance and repair problems that are beyond the abilities of the level one service retailers and to provide all the retailers with technical support a little closer to home.

Regional centers have been formed in Massachusetts, North Carolina, Texas, and southern California to complement headquarters in Cupertino.

Bright Star in the East. The eastern seaboard was a clear beneficiary of Apple's expansion, not just in that they now have two nearby service centers, but in the personnel from Apple that made the transfer. In North Carolina, regional service is now managed by Mike Cornblith, formerly acting western area service manager, a title which actually meant that he was supervising five people in Sunnyvale, California, who, at that time, were handling all Apple maintenance problems in the country.

Cornblith is an outstanding example of the caliber of people Apple has been able to attract. First, he sought out Apple for employment, as so many of Apple's management team have done, rather than waiting for Apple to take the employment initiative by running help-wanted ads.

Second, perhaps partially due to the former reason, Cornblith is a man who truly enjoys his work; his enthusiasm is not only apparent to those who come in contact with him, it feeds him during the long hours he sometimes is required to work.

Charts His Own Course. Cornblith, like so many others at Apple, has never been one to let events pass him by. In fact, he had seized his future by the nape of the neck and was master of his own fate long before Apple attracted him.

He began as an electronics technician and spent years with various companies in that capacity, sometimes as a supervisor, before deciding that he should be in better control of his fate than he could be as a wage slave.

At that point, he mustered his resources and, with a partner, opened a small print shop. Those who have operated their own small businesses know that such entrepreneurial efforts involve exchanging one form of slavery for another. Instead of being a wage slave, you become a slave to the future of yourself, your family, and your employees.

What makes this latter slavery more palatable is that at

Softalk photo

Disk Drive Doctor Goes East

least you are lashed to the helm of your own ship, captaining your own destiny for better or for worse.

It was in 1977 that Cornblith became aware of the infant personal computer industry. After much consideration, he determined that, captain of his fate notwithstanding, his future was better tied to this new form of electronic madness than to the printing business.

Cornblith immediately set about researching the various companies then in the field to determine where he should seek alliance. At every turn he was told that Apple had the best product and the best company. Ignoring good advice is not one of Cornblith's shortcomings, so he hied himself off to Cupertino and got hired.

Ownership Yields to Apple Charisma Inc. Nothing he's come across in his two years with the company has disillusioned him. What he takes greatest pleasure in is, "I'm free to function within flexible guidelines and I have the latitude to make service an integral part of the product sold."

Roughly, this can be translated as meaning that he's still at the wheel of his own ship. It's true that the ship is now part of an armada, and the armada has a chain of command. But Cornblith and most others in similar positions in other parts of the company are given the helm of their own particular craft and made responsible for keeping the craft on course. That the course is set by someone else does not diminish captaincy in the least.

Mike Cornblith's own comment on Apple's esprit de corps is testimony to that truth: "The Apple spirit is amazing. Apple isn't a company, it's a charisma."

While still in California, Cornblith earned the title of disk drive doctor in certain segments of southern California. What happened was that a disk drive died at a most inopportune moment in that, first, it was being employed on a crash business project; second, no local service center could identify the problem; third, the drive was out of its ninety-day warranty by five days; and fourth, it occurred just days before Apple announced its extended warranty program.

Doctored Disk in Record Time. The distressed drive owner finally placed a call to Sunnyvale, location of the maintenance hub, with two questions: If no one local could fix the drive, what was the fastest way to get it repaired? Because the warranty had expired, how much would it cost?

The lucky owner's call was directed to Cornblith, whose reaction was immediate and responsive: "Have the local retailer ship the drive to Sunnyvale for repair." But it was the answer to the second question that ratified for that owner her choice of Apple over competing products: "Apple would never stiff an owner if the equipment died within days of expiration of the warranty."

Cornblith signed on at Apple within days of Will Hood, architect of the service philosophy at Apple, so he's seen the salutary effects of Hood's policies. "We've just about perfected the level one retailer concept now. What we're shooting for is one-day diagnostics and module replacement at the retail level and one-day turnaround for module repair for the retailer from our service centers. We're close now and we'll get there soon."

Very Rare Is the Bad Apple. This emphasis on service is remarkable from a company that manufactures such reliable hardware. The fact that five technicians in Sunnyvale were able to handle all maintenance problems until July of last year is a commentary on the trouble-free nature of the Apple II.

It is also a tribute to Hood and Apple's top management that they foresaw the tremendous spurt in sales now occurring and made service provisions throughout the country before they had serious maintenance problems.

Cornblith's comment on Apple's expansion is relevant, "We're not growing, we're exploding." His enthusiasm for the company carries over to the rest of the family. His daughter Joanne made him a lapel nameplate that proudly proclaims him "Apple Mike." And his wife, Linda, like Mike a native Californian, is delighted with their new home in Fort Mill, South Carolina, outside of Charlotte.

Generosity Typifies Applers Like Mike. The Cornbliths typify other Apple families in one other important way—they are not takers from their community, they're givers. While in California, Mike spent two years manning the Santa Clara County suicide and crisis hotline on a volunteer basis. While it's too soon and too busy for them yet to be involved in community activities in their new home, it's a likely bet that the Charlotte area will soon be feeling the beneficial effects from the new Apple installation. ■

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Innovative Marketing Budges

BY RICHARD KNUDSEN

The unforeseen ramifications of a company's policies can sometimes have a ripple effect that goes well beyond the obvious objects of the policy in question.

Such has been the case with one manufacturer of small, as opposed to personal, computers. The company gave preference to large, volume customers while pushing individual orders from small retailers to the back burner.

What resulted unintentionally, but almost certainly as a direct result of that manufacturer's order-filling policy, was the formation of one of today's most successful software publishers for the Apple—California Pacific Computers, Inc.

Cal Pacific's founder, Al Remmers, was working as a sales rep for the computer company in question. Remmers not only felt the brunt of the dissatisfaction of the small retailer who could not get his order filled, he shared it.

"Individual retailers would put in an order for one or two systems. Then Computerland corporate or another big buyer would come in with orders for several dozen systems. The individual orders would be placed in a back-order status while the larger orders were being processed. Sometimes, the smaller orders would take six to eight months to fill." This, despite the fact that they could have been filled in a few weeks had the orders been processed in the sequence in which they had been received at the plant.

Remmers already had a strong desire to test his sales and marketing philosophies under his own shingle, and the frustrations of obtaining and submitting orders that took months to fill only fueled that desire.

Led Super Invasion. It was about that time, early 1979, that Remmers was visiting one of his regular customers, a retailer in Lawndale. There he saw *Super Invaders* for the first time.

"*Super Invaders* was only in eight stores in southern California at that time. It had only been out for a week and I saw this as an opportunity to get into business on my own."

Remmers contacted Astar International, the Japanese firm who was importing *Super Invaders*, and made a deal for exclusive rights to the program for northern California—rights he still holds.

Thus was California Pacific born. But Astar's quid pro quo, in addition to royalties, for the territorial rights led to the most momentous event so far in the history of the firm.

"*Invaders* was only available on cassette and the terms of my deal with Astar included my manufacturing the program on disk and copy-protecting it."

Budge Wouldn't Budge, But Association Began. It was while searching for someone to handle the copy protection chores that Remmers met Bill Budge, still the star of Cal Pacific's stable of free-lance programmers. Budge didn't accept the copy protection task—that went to Pete Rowe—but Budge and Cal Pacific became a team subsequent to that meeting.

Remmers also obtained the rights to some CP/M product when he opened California Pacific and the Bay Area centralization of the various CP/M-based hardware manufacturers led him to the only false step as yet taken by the firm—he opened an Oakland office even though the company headquarters and his home were in Davis, California, near Sacramento.

"I felt that I needed a business base near Silicon Gulch" is Remmers' explanation. Recently, the CP/M product line was phased out and the Oakland office closed.

Computer Biz Is Location-Free. "We gave thoughtful consideration to uprooting from Davis and taking the whole firm to Oakland. In fact, I made the decision to do just that. I told my wife, Diane, we were moving. Then, as we were walking our dogs in the park one evening about eleven o'clock, it struck me that there was no place in the Bay Area where we could go this late at night and feel safe and secure.

"I turned to Diane and said, 'I know I told you we were going to Oakland, but I just changed my mind. We're staying.' "

Although this makes Remmers sound autocratic and seemingly puts Diane outside the mainstream of California Pacific's business, neither is the case. As with so many firms that are emerging successful, Cal Pacific was a husband-and-wife

A rare picture of an unbearded Al Remmers is featured on the left. Clockwise from lower left: Elain Van Fange, administrative assistant; Steve Gibson, programmer; and Duane Remmers, production. In lower right is the only available representation of Lord British.

Retailers

team effort at the beginning, and Diane Remmers still keeps her finger on the pulse of the company by handling the books.

One positive note about the Oakland base was that it gave Remmers geographical access to Budge, an Oakland resident. Budge had already written his successful *Tranquility Base*, which was published by Stoneware.

Remmers approached Budge about marketing his next program with the soft sell approach. "Give us a try and open up your options. Then you'll have a basis for choice on your subsequent programs."

Remmers Scored with Triple Play. Budge agreed to market his next program through California Pacific, but it was Remmers who ended up with the choice. As events transpired, Budge had three arcade games near completion and gave Remmers the option as to which he'd market.

At this point, Remmers's marketing instincts stood him in good stead. He proposed that all three programs be marketed on the same disk, strongly pressing home the point that they'd be the first to have marketed multiple good programs on a single disk at a single price.

Thus was *Trilogy* born, certainly one of the top five selling programs of 1980.

Even the name of the package reflected Remmers's different approach. Prior to *Trilogy*, the names of the authors had been downplayed and the names of the software publishers prominently displayed. Remmers noted this was contrary to the natural order of things in the book and movie businesses, where the name of the publisher or distributor is far less noticeable and important to the end consumer than that of the author, star, or director.

"Nobody goes to see Twentieth Century-Fox's *Star Wars;* they go to see George Lucas's *Star Wars*. Likewise, nobody reads a book because it's published by Doubleday—they read the book because they know and like the author. People in the software business had their priorities backward."

Publisher Sensitivity Leads to Author's Fame. Remmers moved immediately to remedy this misplaced emphasis by titling the disk *Bill Budge's Trilogy*. The success of *Trilogy* and Budge's subsequent product for California Pacific, *Space Album* and *3-D Graphics Package*, had the effect of the author eclipsing the publisher. Game players everywhere knew programs by Bill Budge, but practically no one could dredge up the name of the publisher.

It wasn't only in naming the program that Remmers's marketing philosophy was felt. Rather than spending big dollars on advertising, Remmers put the equivalent money into producing and mailing a demonstration disk that would let the retailer see exactly what he was buying.

The demo disk not only serves the retailer, it addresses a problem that has troubled Remmers for some time. "Time is always the bottleneck. First, there's the time in developing the program. Then there's the time in getting each retailer to evaluate the product."

A demo disk can't help the development process, but it cuts dramatically the time it takes a retailer to make a buying decision. That time-saving is convertible directly to sales.

Respect for Retailer Pays Off. Remmers shows his concern for retailers in another way. California Pacific absolutely refuses to make direct sales to the end consumer. When they receive inquiries, the user is directed to his local computer store or to retailers who advertise in national magazines.

Success of Remmers's marketing tactics was most graphically demonstrated in *Softalk*'s first bestseller poll (October 1980). Four California Pacific products made the Top Thirty: *Head-On*, from Astar, and Budge's three programs.

That accomplishment was effectively achieved within the time span of twelve months. California Pacific's *Super Invaders* hit northern California in mid-October of 1979 and *Trilogy* followed in December. *Space Album* made its debut at the West Coast Computer Faire in March. *Head-On* was released in July.

Following were *3-D Graphics* from Budge and *Akalabeth*, written by Lord British.

The success of the *3-D Graphics System* has been a pleasant surprise. "Budge developed the program as a utility for his own use, but we thought, 'Why not try to market it for other programmers?' We thought we might sell a few hundred over a long period of time." Instead, the program zoomed to the third slot on the Top Thirty and, although it's tailed off some, remains a solid seller.

Paradox: Author Lord British Is Anonymous. California Pacific maintains an aura of mystery about the identity of Lord British, author of *Akalabeth.* Speculation has ranged from a child prodigy being protected by his parents to a British recluse. Neither is correct. Remmers is willing to acknowledge any correct guess as to the identity of Lord British, but offers no information on his own.*

Although Remmers looks at California Pacific as primarily a software publisher, its marketing success has drawn it into distribution as a second business activity. Currently, Cal Pacific has nonexclusive rights to product from Sirius Software and Strategic Simulations. With each of those publishers having product on the Top Thirty list, Cal Pacific is one of the major volume shippers of product in the country.

Company Grows with Success. This expansion of business activity has had concomitant growth in personnel. Starting with himself and Diane in Davis and Randy Moore in Oakland, Remmers has since added three people, although Moore left the company when the Oakland office was closed.

The first addition, in May, was Duane Remmers, Al's brother, to handle production and shipping. In September, Elain Von Fange and Steve Gibson came on board. Von Fange functions administratively and Gibson has assumed such programming chores as copy protection.

Good copy protection has a high priority at California Pacific. "In areas where *Super Invaders* was sold on cassette and unprotected, *Trilogy* outsold *Invaders* ten to one," reports Remmers. Considering that *Invaders* is probably the bestselling game to date for the Apple, that sales ratio indicates the lethal economic effect of the software pirate.

Gibson had a negative insight into the effect of copy protection. "Programmers will write code differently—in a more cumbersome manner—when they know their program will be copy-protected."

New Product Will Include Nongames. California Pacific lost the battle to have Budge's next package and Lord British's next fantasy game ready for Christmas, so both will be available early in the first quarter of this year, and still other packages are in the works.

The focus will not remain entirely on entertainment product. Remmers aspires to bring out the complete word processor for the Apple computer. He has a vision for such a product while conceding that it does not yet exist.

A new refrain that's being heard in more than one corner of the Apple industry was also sounded by Remmers. "We're running into the limitations of the hardware in our new product development." This is not to be taken as a pejorative jab at Apple, but merely as a reflection that the programmers are finally achieving technological parity with the hardware. However, Remmers has no concern about those limitations as they affect his new product development.

Multitasking and Multimicroprocessors in Future. Remmers sees the next programming breakthrough as harnessing the Apple to do multitasking, which would contribute to making it a more valuable business tool as well as allowing more flexibility in constructing complex entertainment.

He's looking forward to the day when other microprocessors will be harnessed in tandem with the 6502 in the Apple to make some of these advances not only possible, but easy. ■

*Softalk will award $50 in product from any *Softalk* advertiser to the reader who can first correctly *describe* the identity of Lord British. Each month that Lord British remains unidentified, *Softalk* will publish a clue provided by California Pacific. Most imaginative incorrect descriptions may also be published. Al Remmers of California Pacific shall be the sole judge of whether the identification in any particular entry is sufficient. First clue: Lord British is not a resident of Silicon Gulch.

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requires a 48K, 16-sector disc based APPLE II system

To use PFS you simply design a form on the screen by typing the names of the items you want to store information about. Once the form is created you tab from item to item and fill in the information. This can be a single piece of data or several pages of text. Up to 1000 forms can be stored on a diskette.

Looking up information is just as easy. PFS can search for a number, a single data item, or a word within a page of text. All forms that match are displayed on the screen. You can browse through each one and change, delete, expand, or print it. PFS even has a print formatter that lets you create mailing labels.

PFS software is different. It is not a specialized application package or a complex programmer oriented data base manager. It is a personal filing system that lets you communicate with the computer using meaningful everyday concepts to rapidly create files on any subject matter you require.

PFS is available through your local dealers. If they don't carry it, have them give us a call at (415) 368-7598 or write to us at Software Publishing Corporation, P.O. Box 50575, Palo Alto, CA

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Softalk Presents The Bestsellers

VisiCalc from Personal Software again heads *Softalk*'s Top Thirty listing. However, an amendment to the Top Thirty as published in the November and December issues drops *VisiCalc* to second for those two months.

November's Bestsellers discussed the reasons why *Softalk* was disqualifying *DOS 3.3*, from Apple Computer Inc., from consideration. The basic rationale was that the buyer had to purchase chips at the same time, making the product a hybrid as opposed to pure software.

The inclusion of the chips in the *DOS 3.3* package is discussed on page 10 of this issue in Open Discussion. Rob Campbell of Apple was sufficiently persuasive in his position that *DOS 3.3* is software and that the chips are included in the package as a convenience that *Softalk* has adopted that view.

For those who track the Top Thirty on a monthly basis, this revision to the published lists is called for to reflect *DOS 3.3* for the months of October and November: place *DOS 3.3* at the top of both lists with an index rating of 111.32 in the November printed Top Thirty and an index rating of 102.67 in the December printed Top Thirty.

DOS 3.3 was accepted so rapidly by Apple owners that its sales are already beginning to diminish as reflected by its second place finish in this month's poll.

Three other items of particular note were the ascension of Nasir from Sirius Software as the hottest new programmer, the displacement of *Easy Writer* as the top word processor, and the rise of the *Data Factory* data base.

Nasir's *Star Cruiser* held on to third place in this month's poll. The surprise was his *Cyber Strike* moving into sixth position. That makes him competitive with Bill Budge, Ken Williams, and Bob Clardy, all of whom remain well-represented on the Top Thirty, and each has several programs that were near misses.

Easy Writer's drop in the Top Thirty was attributed by many to the difficulty in procuring eighty-column boards intended to run with the Pro system.

Micro Lab's *Data Factory* has been stalking *CCA DMS* for the position of top data base program for some months. It has gone from twenty-eighth to nineteenth to this month's tenth and has finally overtaken *CCA DMS*. Many retailers are reporting a heating up of the data base competition with the December arrival of *DB Master* from Barney Stone.

November sales, which are represented in this poll, were significantly ahead of October retail results. Interest in Apple microcomputers and software has had added impetus from Apple's new advertising campaign and from nationwide coverage of the stock issue by Apple.

The varying level of sales from month to month makes necessary the caution that the sales index numbers shown to the left of the program name have a correlation only in the month to which they pertain. Trying to equate an index number of 50 in December with an index number of 50 in January will only cause confusion and misleading conclusions. The index numbers are arbitrary representations of the relative strength of the programs listed in the Top Thirty.

Low index numbers are patently *not* an indication of weakness of those programs. These programs are successful commercial software or they wouldn't have received sufficient market acceptance to rank in the Top Thirty.

Rather, low index numbers are testimony to the real strength of the program currently leading the list. In each month to date, that program has been *VisiCalc*.

Commencing with the February issue, which will be tracking December sales, the Bestsellers will be expanded to include separate listings for business programs and utility and other nonentertainment programs. Many such programs have steadily appeared in the second thirty list. ◨

The Top Thirty

1.	1.	98.07	*VisiCalc*, Software Arts Inc./Dan Bricklin and Robert Frankston, Personal Software
2.	—	74.85	*DOS 3.3*, Apple Computer Inc.
3.	3.	70.05	*Star Cruiser*, Nasir, Sirius Software
4.	2.	59.36	*Hi-Res Adventure #2: The Wizard and the Princess*, Ken and Roberta Williams, On-Line Systems
5.	4.	50.88	*Flight Simulator*, Bruce Artwick, SubLogic
6.	—	49.04	*Cyber Strike*, Nasir, Sirius Software
7.	15.	44.98	*Super Invaders*, M. Hata, Creative Computing
8.	11.	42.03	*Dogfight*, Bill Basham, Micro Lab
9.	10.	39.45	*Apple Plot*, Apple Computer Inc.
10.	19.	38.34	*Data Factory*, Bill Passauer, Micro Lab
11.	9.	37.97	*Hellfire Warrior*, Automated Simulations
12.	7.	36.13	*Asteroids in Space*, Bruce Wallace, Quality Software
13.	8.	33.18	*DOS Tool Kit*, Apple Computer Inc.
14.	—	32.45	*Hi-Res Football*, Jay Sullivan and Ken Williams, On-Line Systems
15.	5.	31.71	*CCA Data Management System*, Creative Computer Applications, Personal Software
16.	14.	30.60	*Odyssey*, Bob Clardy, Synergistic Software
17.	16.	29.86	*Sargon*, Dan and Kathe Spracklen, Hayden
18.	16.	28.76	*Temple of Apshai*, Automated Simulations
19.	27.	28.39	*Rescue at Rigel*, Automated Simulations
20.	6.	28.02	*Bill Budge's Space Album*, Bill Budge, California Pacific
21.	—	26.17	*Apple Writer*, Apple Computer
22.	25.	25.81	*Adventure*, Software Associates/Gordon Letwin, Microsoft
23.	—	22.12	*Akalabeth*, Lord British, California Pacific
24.	—	19.91	*Morloc's Tower*, Automated Simulations
25.	28.	18.43	*Asteroids*, Marc Goodman, Adventure International
	—	18.43	*Datestone of Ryn*, Automated Simulations
27.	12.	17.70	*Computer Quarterback*, Dan Bunten, Strategic Simulations
	18.	17.70	*Easy Writer*, John Draper, Information Unlimited
29.	—	16.60	*Apple Adventure*, Apple Computer
30.	19.	16.22	*Bill Budge's 3-D Graphics Package*, Bill Budge, California Pacific

Apple-franchised retail stores representing approximately 11 percent of all sales of Apple and Apple-related products volunteered to participate in the poll.

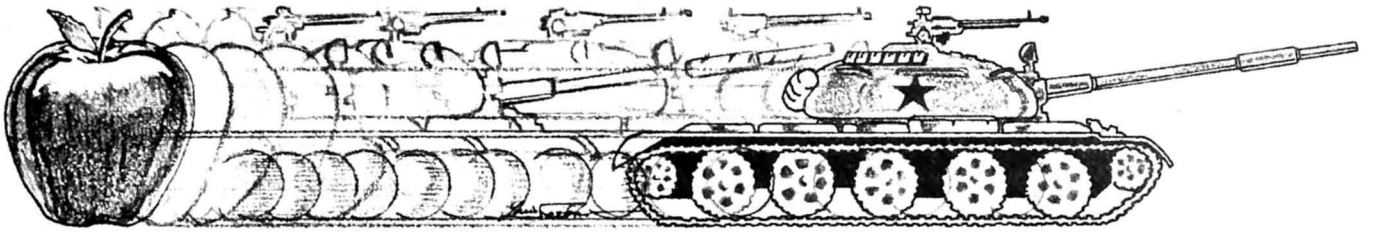
Respondents were contacted early in December to ascertain their sales leaders for the month of November.

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

Respondents in December represented every geographical area of the continental United States as well as Hawaii.

Results of the responses were tabulated using a formula that resulted in the index number to the left of the program name in the Top Thirty listing. The index number is an arbitrary measure of relative strength of the programs listed. Index numbers are correlative only for the month in which they are printed; readers cannot assume that an index rating of 50 in one month represents equivalent sales to an index number of 50 in another month.

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



HOW TO TURN AN APPLE INTO A TANK.

With **Computer Conflict**™ and a little imagination, we'll transform your staid and respectable Apple computer into the fearsome war machine of the Soviet Red Army. Computer Conflict actually consists of two fast-paced, action-packed wargames played on full-color mapboards of Hi-Res graphics: **Rebel Force** and **Red Attack!**

REBEL FORCE puts you in the role of a Soviet commander whose regiment must face a computer-directed guerrilla uprising which has overrun a vital town. Armed with your tank, heavy-weapons, and infantry units, your mission is to regain the town through the annihilation of the Rebel Force.

Your advance will be brutally opposed by minefields, ambushes, militia, and anti-tank guns — all skillfully deployed by your computer. Survival and success of your units will depend on your ability to take advantage of the variable terrains – open, forest, and rough – each of which has different movement costs and shelter values.

In this finely-balanced solitaire wargame, every move is played under real-time conditions: Procrastinate and lose. At the same time, caution cannot be cast aside; severe unit losses will only result in a Pyhrric victory at best.

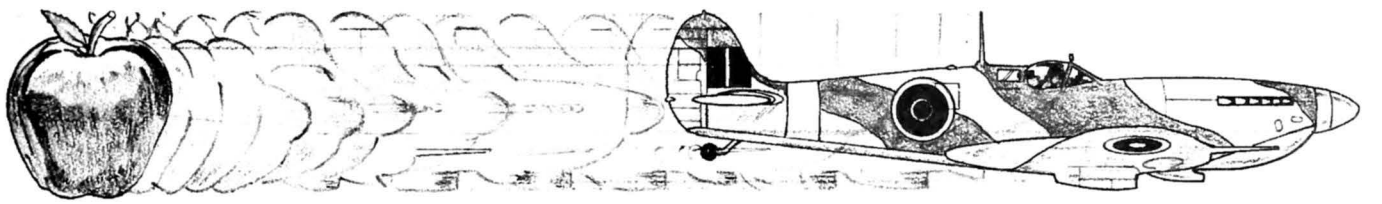
With its five levels of difficulty (plus one where you make up your own), the computer can and will stress your tactical skills to their fullest.

RED ATTACK! simulates an invasion by a mixed Soviet tank and infantry force against a defending battalion. As the defender, your task is to deploy your infantry units effectively to protect three crucial towns — towns that must not fall!

As the Russian aggressor, your objective is to crush the resistance by taking two of these three towns with your tanks and infantry. With control of these strongpoints, the enemy's capitulation is assured.

Red Attack! is a two-player computer simulation of modem warfare that adds a nice touch: At the start of each game, the computer displays a random setup of terrains and units, providing every game with a new, challenging twist.

Computer Conflict, for $39.95, comes with the game program mini-disc and a rule book.



OR A SPITFIRE.

After you're done playing Computer Conflict, you may be in a mood for something other than ground-attack wargames. In that case, **Computer Air Combat**™ is just what you need.

With Computer Air Combat, your screen lights up with an open sky generated by Hi-Res graphics offering global and tactical plots. Squint your eyes a bit, let loose your mind, and you'd swear your keyboard has melted into the throttle, rudder, altimeter, and other cockpit instrumentation of a World War II combat plane. In fact, any of 36 famous fighters or bombers, from a Spitfire and B-17 Flying Fortress to the Focke-Wulf 190 and A6M5 Zero. Each plane is rated – in strict historical accuracy and detail – for firepower, speed, maneuverability, damage-tolerance, and climbing and diving ability.

Practically every factor involved in flying these magnificent airplanes has been taken into account, even down (or up?) to the blinding sun. Climb, dive, twist, and turn. Anything a real plane can do, you can do. However, the computer prevents all "illegal" moves – such as making an outside loop (which in real life, would disastrously stall a plane).

PLAY THE COMPUTER. Aside from being the game's perfect administrator and referee, the computer will serve as a fierce opponent in the solitaire scenarios provided: Dogfight, Bomber Formation, radar-controlled Nightfighter, and V-1 Intercept. There's even an Introductory Familiarization Flight (with Air Race option) to help you get off the ground.

With the number and type of planes and pilot ability variable, you can make the computer as challenging as you want to give you the ultimate flying experience.

PLAY A HUMAN. Two can play this game as well, in dogfights and bomber attacks. Given a handicap of more or better planes or an ace pilot (or all of the above), even a novice at Computer Air Combat stands a chance to defeat a battle-hardened veteran.

For $59.95, Computer Air Combat gives you the game disc, a rule book, two mapboard charts (for plotting strategies between moves), and three player-aid charts.

Credit card holders, if you own an Apple®II 48K (Applesoft ROM) and a mini-floppy disc drive, call **800-227-1617 ext. 335 (toll free)** and charge your order to your VISA or MASTERCHARGE. In California, call 800-772-3545, ext. 335.

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- ☐ **Computer Ambush** (a tactical simulation of man-to-man combat in WWII) for your apple: $59.95
- ☐ **Computer Napoleonics**, the Battle of Waterloo for your Apple: $59.95
- ☐ **Computer Quarterback** (a real-time strategy football game): $39.95

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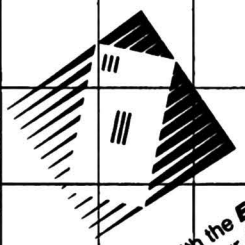
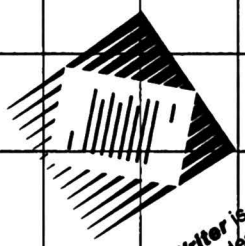
EasyMover is the first *Electronic Mail System* which combines the versatility of a word processor with the ability to move or transmit text files to another computer.



Now, with the ***EasyMailer*** system, your Apple can be used to greatly reduce time, paperwork, and money spent on form letters, mailing labels, and other documents.



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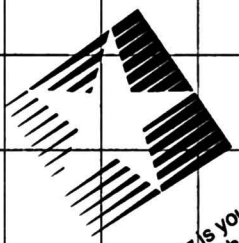

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Datadex is the key to interactive data management for your Apple computer and the heart of an automated office's operation.
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