

# SoftSide™

The Magazine For You & Your Computer

#41

THREE DOLLARS

Financial Operating System  
A New Column To Get Your Money Under Control

**Joystick Alternatives**  
Give Your Hand A Break

**The Ubiquitous  
Bar Code**  
Is It All Black & White?

**Computers &  
Personal Values**  
Do They Go Hand In Hand?

**Adventuring**  
A Mother's Perspective

**Poker Squares**  
A Software Game That  
May Bluff You!



**Software Reviews:** APPLE® — Pinball Construction Set  
ATARI® — Slime, Graphic Master  
IBM® PC — Filemanager +, Macro Assembler  
TRS-80® — Dunzhin, Eliminator



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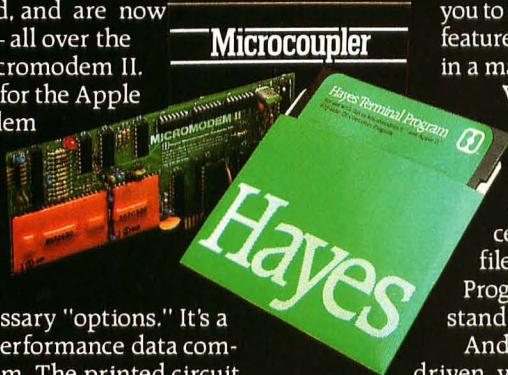
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\*Number of disk sides varies due to varying disk storage efficiency on different computers.

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Leyte  
Titan

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Melody Dice

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Magical Shape Machine

### PRACTICAL APPLICATIONS:

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S.W.A.T.

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Defense  
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Maze Search

### BOARD GAMES:

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Battlefield

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Gambler

### ADVENTURE:

Operation Sabotage

### SIMULATIONS:

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Titan

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Melody Dice

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S.W.A.T.

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Space Rescue  
Maze Sweep  
Quest

### BOARD GAMES:

Flip-It  
Battlefield

### GAMES OF CHANCE:

Solitaire  
Gambler

### ADVENTURE:

Operation Sabotage

### SIMULATIONS:

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Titan

### WORD GAME:

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### GRAPHICS UTILITY:

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### PRACTICAL APPLICATIONS:

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A true software bargain, **The Best of SoftSide** may be ordered at only \$19.95 per book, or \$68.95 per book and disk combination. If you already ordered the book and would like to add the disk, the additional cost is only \$49.00. Important: Be sure to specify computer make and model when ordering! Use the bind-in card in this issue to order today! Mail it with your payment or credit card number to **SoftSide Publications Inc., 6 South Street, Milford, NH 03055.**

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*SoftSide* Vol. 6, No. 8

SUBSCRIPTION INQUIRIES should be sent to *SoftSide* Publications, Inc., 100 Pine Street, Holmes, PA 19043. EDITORIAL AND ADVERTISING CORRESPONDENCE should be sent to *SoftSide* Publications, Inc., 6 South Street, Milford, NH 03055. Telephone (603) 673-0585.

*SoftSide* (ISSN 0274-8630) is published monthly by *SoftSide* Publications, Inc., 6 South Street, Milford, NH 03055. Printed at Volkmoth Printers, St. Cloud, MN. Second class postage paid at Milford, NH, and additional mailing offices. Subscription rates: US, APO/FPO and Canada, \$30/12 issues. First Class US, First Class Canada, and Mexico, \$40/12 issues. Other foreign countries, \$62/12 issues. Media subscription rates: US and APO/FPO, — Magazine and Cassette, \$99/12 issues. US and APO/FPO Magazine and Disk \$149/12 issues. Canada and Mexico, — add \$20/12 issues. Other foreign countries — add \$50/12 issues. All remittances must be in US funds. Entire contents Copyright © *SoftSide* Publications, Inc., June, 1983. All rights reserved. POSTMASTER: Please send form 3579 to *SoftSide* Publications, Inc., 100 Pine Street, Holmes, PA 19043.

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# Editorial

## THE HAMMER DIDN'T HIT YOUR THUMB, YOU DID!



Computers and video games are getting a lot of bad press these days. "Children are using their lunch money to play in the arcades," says one school board member. "I haven't seen my husband since he got that thing," complains a housewife. Beyond these particular complaints, the prospect of the "Big Brother" computers bringing destruction to the world continues to be a threat to the uninformed. For years we've blamed the computer for errors on our utility bills, credit card statements and bank notices.

To blame a mindless, faceless machine for the problems and errors caused by humans is easy. The machine can't fight back, and so few in our society understand how it works that a vague, implied error easily can be attributed to this mysterious "black box." In the end, however, the accusatory fingers must be turned back to human beings. The responsibility buck may stop anywhere in the chain of humans involved in the computing process — from the original hardware designer to the software author, right down to the end user. But, somewhere in that vast chain, the responsibility for the problems blamed on the computer lies with human beings.

I cannot emphasize too strongly that the computer is *only* a tool. That tool may be used for good or ill, as a hammer can be used to construct a home or hit a person on the head, but the responsibility for the use of any tool, hammer or computer, lies with the person using it. Preliminary research shows that only a very few children sometimes spend their lunch money on arcade games. However, even if it were a

predominant problem, would the difficulty lie in the video games or with the children's lack of understanding that food in their system is more important than entertainment — of any sort. The example of the husband or any other person spending all of his/her time at the computer, neglecting all other responsibilities, is a case of *compulsive* behavior. The compulsive personality will always find some outlet. If it weren't the computer, the same person would find some other behavior to be compulsive about — hobby, profession, or social organization. The problem lies not with the computer, but with the compulsive personality.

Let's take the analogy of the computer and hammer as tools a little further. When you hit your thumb when driving a nail, can you really blame the hammer for the mistake? Its designer, maybe, the hammer, no. If a computer "eats" all of your financial records for the past year, is it the computer's fault? If you entered a wrong command, you might blame yourself or the author of the software for making its operation too difficult. However, the computer simply did exactly what it was told to do.

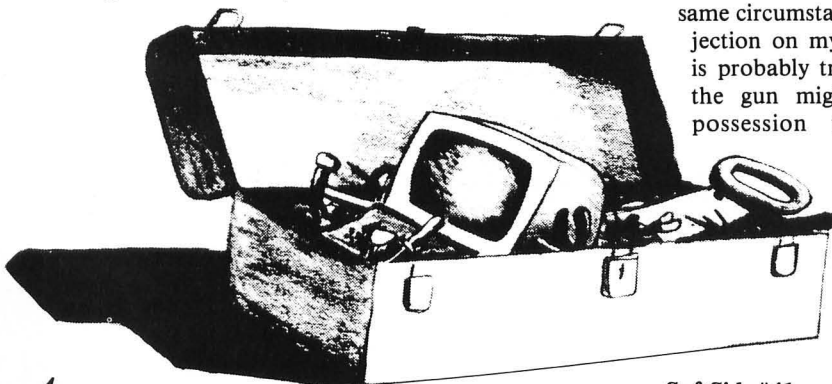
I recently attended the Computers and Personal Values seminar discussed by David DeLong on page 33 of this issue. At that enlightening event, I kept repeating the premise that I present here — the computer is *only* a tool. At one point, Joe Weizenbaum proposed that any tool has an implied use in its design. He told me that if I walked into his room and found a gun on his bed, I would assume a different set of values for that tool than if I found a camera in the same

circumstances. His projection on my assumptions is probably true. However, the gun might be in his possession to eliminate

overpopulated deer who are starving because they can't find enough food in the forest. The camera might be used to take pictures of someone's personal financial records for blackmail purposes. The fault lies with my *assumptions* of the tool's use, not with its *actual* implementation. Both the gun and camera could be used for good or ill, but neither application is implied in their existence. Again, the responsibility for the use of any tool lies with the person using it, not with the tool itself.

With the creation of the computer, our society has given itself the most universal and powerful tool yet. In its potential applications, it can be used for inestimable good or ill. Television was introduced with very few regulations on its implementation. It took many years of experience with the new medium (tool) to learn the extent of its applications both positive and negative. Even today we have not exercised television to its maximum good, but we are aware that it has had a more positive than negative impact on our culture. We are also aware of television's negative applications and are implementing regulations to minimize their effect. We have taken responsibility for television's effect on our society.

We must be willing to take the same responsibility for the computer's effect on our culture. Weizenbaum would have us halt the use of computers in schools until we know more about their impact. I propose that we can't learn about their impact through any method other than implementation and observation. No lab is large enough to give us the comprehensive results we need to judge the massive effects of computers on our society and its educational system. This tool needs to be put in the hands of the people who will be using it in the society of the future and they (we) must take the responsibility to monitor its implementation and direct it to its most positive ends.



Randal L. Kottwitz  
Publisher/Editor-in-Chief



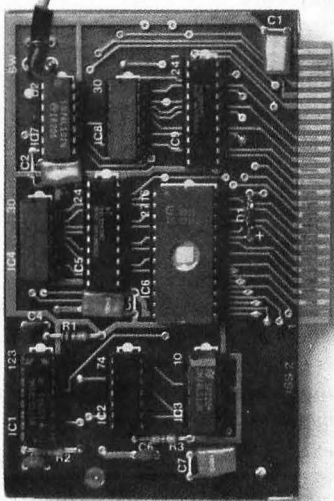
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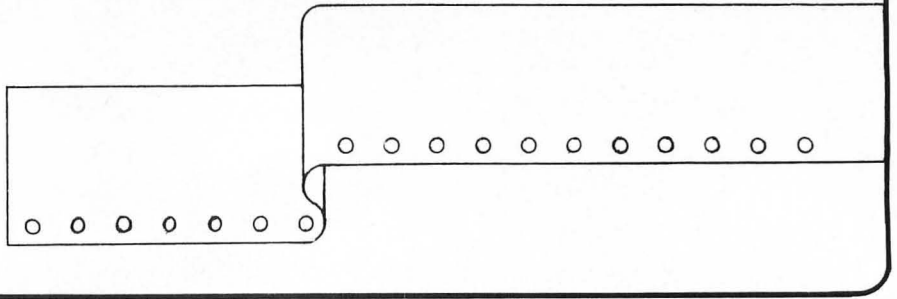
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Apple and the Apple logo are registered trademarks of Apple Computer, Inc.—CP/M—trademark of Digital Research, Inc. Locksmith—trademark of Omega Microwave, Inc. Nibbles Away—trademark of Computer: applications.

Software is not copy protected. System requirements: Apple II Plus with 64K and DOS 3.3 or Apple IIe. Franklin Ace also supported.

\*Wildcard does not operate with CP/M® or other microprocessor based software.



## Computer Literacy

Dear *SoftSide*,

I wish to thank you for your recent editorial "The Gift of a Lifetime." As a member of the data processing training section at Union Mutual Life Insurance Company, I can say that computer awareness among our non-data processing personnel is one of our major concerns.

After reading your review of "The Computer Programme," we rented the series for one week and showed the film to a test audience of clerical, technical, supervisory, and managerial personnel who had very little knowledge of computers. The general reaction was very positive; the film series was everything you said it was.

We are purchasing the series and plan to schedule periodic showings, making it available to all of our 2000 home office employees. So thanks again for the tip.

Keith M. Sawyer  
Portland, ME

**Editor's reply:** It is always gratifying to learn we have furthered the cause of computer education, especially on such a grand scale as you describe. Your company is certainly taking the long view in providing all employees a leg up in their quest for computer literacy. "The Computer Programme" is currently airing on PBS on the Adult Learning Services Telecourses series sponsored by the National University Consortium. Check your local listings for more information.

## Love the New Format

Dear *SoftSide*,

I have had my renewal coupon since October and I didn't use it until I saw #39's goodies — "Risk" and "Savo Island." For a while, I have wondered if *SoftSide*'s worthless because of diversity, but your 39 may be the best idea since you got the DV. Now what are your opinions about Commodore-64? It seems the hottest computer yet. Are you adding other computers to *SoftSide*? Compute! is the best yet on

C-64 and I wonder if you'll *SoftSideize* the C-64 because it would emulate Apple, TRS-80 or PET?

David Ong  
Chicago, IL

**Editor's reply:** *SoftSide* is now doing preliminary research on the Commodore 64 and we expect to add it to the list of systems we cover later this year. Until then, enjoy your subscription and we will keep you posted on future plans.



Dear *SoftSide*,

*SoftSide* issue #39 just arrived today. I had to fire off a fast note telling you what I think about "SoftSide Selections with Flip-It II." My first impression is: Good Work! *SoftSide*.

Now, not everybody is going to like the change. Your new format will not let people with more than one computer type in programs from the magazine. Programs will still be translatable, of course, but will require effort and some skill.

The second cover is very nice and pretty, but it did take your mention of it in the OUTPUT column to make me turn back and really look at it.

Just yesterday, I went up to the closet shelf and looked through my pile of (about 23) issues of *SoftSide*, checking back issues to review documentation for TRS-80 programs on "The Best of *SoftSide*." I've had the Atari Disk Version since it started. I just bought the TRS Disk Version.

In conclusion, the Main Line with individualized Flip-It II's is really Great! Please keep some information in the Main Line Magazine for cross-fertilization. Many

Apple Programs become available in Atari versions, and it was information about the features of the Atari that helped me choose it as a "second" computer.

I don't feel "cheated" of the other versions (TRS-80) because I haven't been typing them in, and I buy the "Best of" for TRS-80 disk.

Donald C. Hennessy  
Massapequa, NY

Dear *SoftSide*,

Since receiving your magazine, I have found that you have beaten the rest in information, software, and programs. Since I own an Atari 800, I have tried to find a magazine compatible with my computer, to no avail. So I decided to search yours, and to my surprise, yours is the best of all.

I salute you and your staff for contributing to a fine magazine. Keep up the good work.

Promise that you won't change it, except to make it better. In my opinion it is already the best.

I thank you and my Atari thanks you.

Cesar Perez Morales  
Mary Esther, FL

**Editor's reply:** Needless to say, we waited excitedly for feedback from our readers on the new format. From what you have told us we made the right judgments about what you would like to see in the next generation of *SoftSide*.

## A Little Disappointment

Dear *SoftSide*,

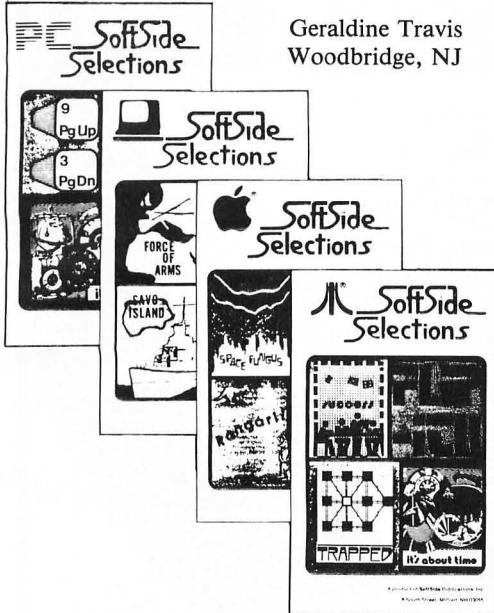
I am very disappointed to see that your magazine format has changed.

I am a curriculum specialist in charge of computers in my school district. We, the teachers and I, have looked forward to each issue of your magazine because of the variety of machines you discuss and because of the programs that you include for the various machines. We presently use both



the Apple IIe and the TRS-80 Model III in our schools. I, therefore, find it difficult to choose one of the two booklets you are offering. If I choose the newsstand issue, I am missing out on two programs. Kangarilla for the Apple and Savo Island for the TRS-80. If this situation can be rectified I would appreciate it.

Geraldine Travis  
Woodbridge, NJ



Dear *SoftSide*,


I wish to express my disappointment with your new policy concerning content that I found after purchasing *SoftSide* #39. Just one program.

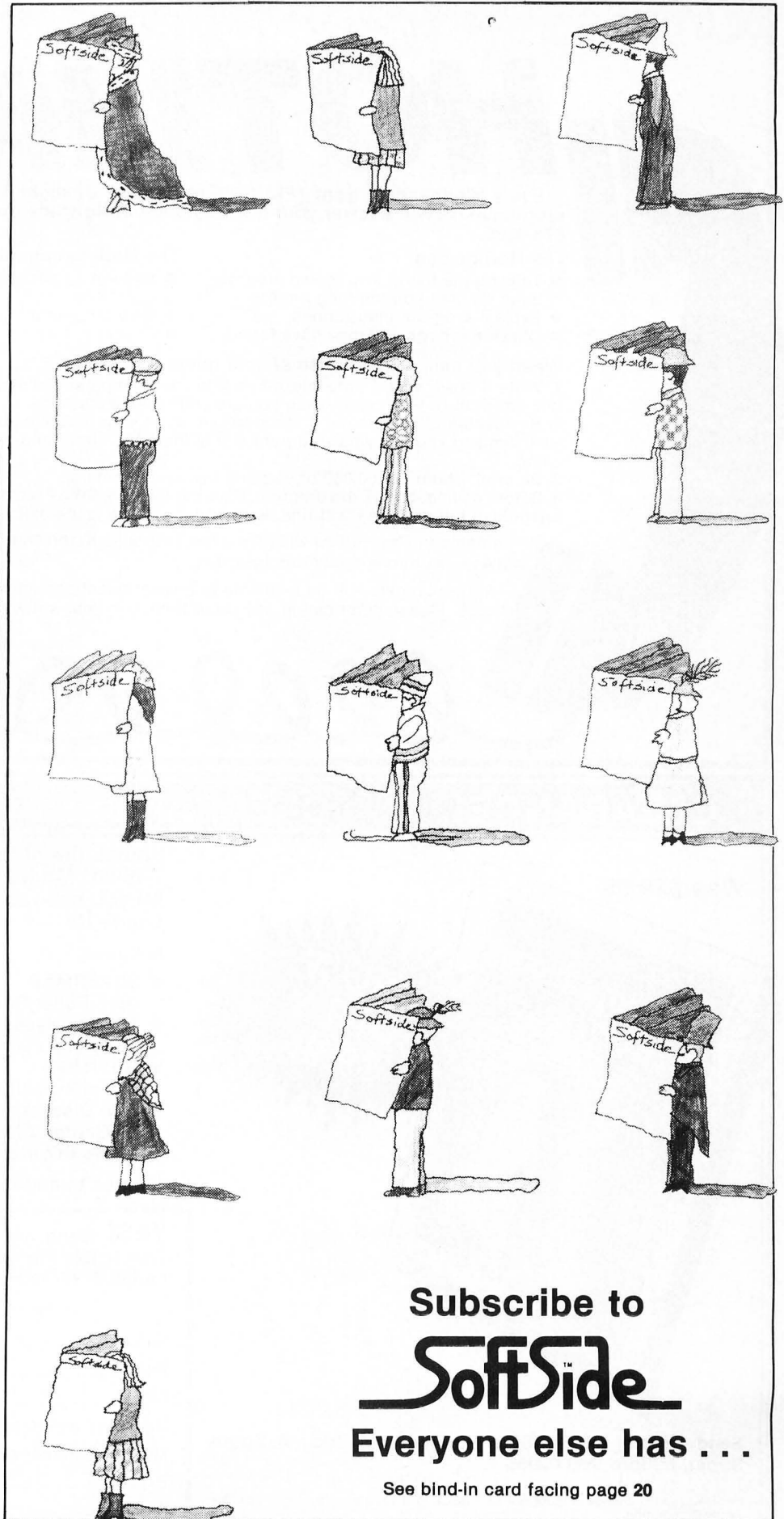
I use your magazine to have students type in programs. This for economy and for experience so that they can see various programming techniques and also in debugging. They have gotten great satisfaction out of getting rather complicated programs running.

Now I get only one program for my purchase unless I take out a subscription and then I am restricted to only one machine. This is very unsatisfactory to my usage. The students get excellent experience in trying to convert programs from one machine to another.

Other magazines have, for a long time presented reviews, new products, and other articles of more general interest. Yours I purchased for PROGRAMS.

Harry Gessner  
Absecon, NJ

**Editor's reply:** We appreciate the store you set in our programs and we certainly regret that our format change has caused you inconvenience. You should know that *SoftSide* is sensitive to the needs of our multi-system readers. We knew that a few subscribers had more than one system when we decided to upgrade the format, and we are working on an arrangement which we expect will make everyone happy. 



Subscribe to  
**SoftSide**  
Everyone else has ...

See blind-in card facing page 20

# HOTLINE

Every Wednesday, from 7PM to 9PM Eastern Daylight Time, the SoftSide programmers will answer your questions about SoftSide programs. Call (603) 673-0585.

#### The Hotline can:

- Tell you the fix for any known program bugs, or mail you the long ones.
- Explain program instructions.
- Check out bugs you may have found.

#### The Hotline cannot:

- Answer subscription or editorial questions.
- Give programming advice.
- Accept collect calls.

#### When you call, follow these simple rules:

1. Write it down and, if possible, sit next to your computer when you call. This is a certain shortcut to your point when you are calling long distance.
2. Be specific. It betters our chance to zero in on your problem quickly. The first thing we'll want to know is what program you're inquiring about and what computer you're using.
3. Be brief. There are 50,000 of you and five programmers...
4. Before calling, **SWAT** the program, if we published a **SWAT** table with it. Most "bugs" are hidden typos. **SWAT** will find them and may save you a call.

Remember: The **Hotline** will give a fast response to the short questions. We will deal with long questions in writing.

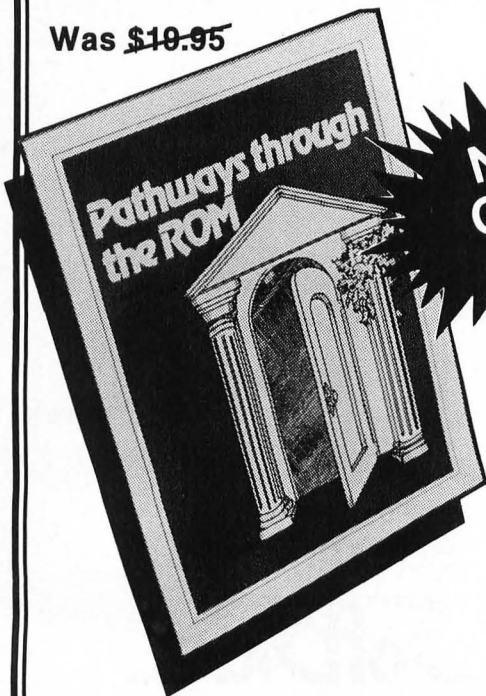
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# Bugs, Worms, and Other Undesirables



## Puzzle Jumble

An error in TRS-80 *Puzzle Jumble* (Issue 34) caused the program to crash on 32K systems. This may be corrected by changing the constant 192 in line 6000 to 191 as shown below.

```
60000 ...  
IFPEEK(-1) × †0THENX = 191:POKE ...
```

## Atari Volcano Island

The Atari CV version of *Volcano Island* (Issue 40 Adventure) will crash with a string length error if you try to decode a hint that

is more than 40 characters long. This is easily corrected by changing the DIM statements in line 2761 to allow A\$ and Z\$ to be as long as 125 characters rather than 40.

## TRS-80 Checking

Four characters were dropped from the listing of line 920 of TRS-80 *Checking* (Issue 37). The missing part was the sequence = "Q" and the fragment below shows where it goes in the line.

```
920 ... LEFT$(VA$,1) = "Q" THEN 110 ...
```

## TRS-80 Minigolf

The introductory article erroneously states that the program has sound.

## Garage Sale Record

As listed, the cassette version of TRS-80 *Garage Sale Record* will not quite run in 16K. This can be corrected by reducing the amount of memory reserved by the program for data. The lines shown below give largest possible values to use in a 16K Model I or Model III.

```
20 CLEAR 63000:GT=0:NS=0  
30 DIM S$(10),T$(10,63)  
40 DIM T(10),P(10,63)
```

## Human Errors

The article for *Human Errors* (Issue 38 Atari DV) did not give file names for the three programs that make up the package. They are given below.

```
MESSAGE.LST  Errors program  
WRITER.SVE   Error file writer program  
COPIER.SVE   Error file copier program
```

MESSAGE.LST is already in ASCII format. You do not have to LOAD it and LIST it as described in the article. To append MESSAGE.LST to your program, load your program and then type ENTER "D:MESSAGE.LST". The other two files are BASIC programs.

## Atari Quest

In lines 102, 106 and 108, the underlining which indicates inverse text should continue through the spaces between underlined words.

Line 30020 should read RESTORE 30050. The last 0 was dropped from the listing.

## Atari SWAT

The first line of the SWAT table for Atari SWAT shows a length of 581. This should be 586.

## TRS-80 Quest

In line 460, the first DATA item should be a 2, not a quote.



The bug  
campaign  
goes on...  
Aargh!

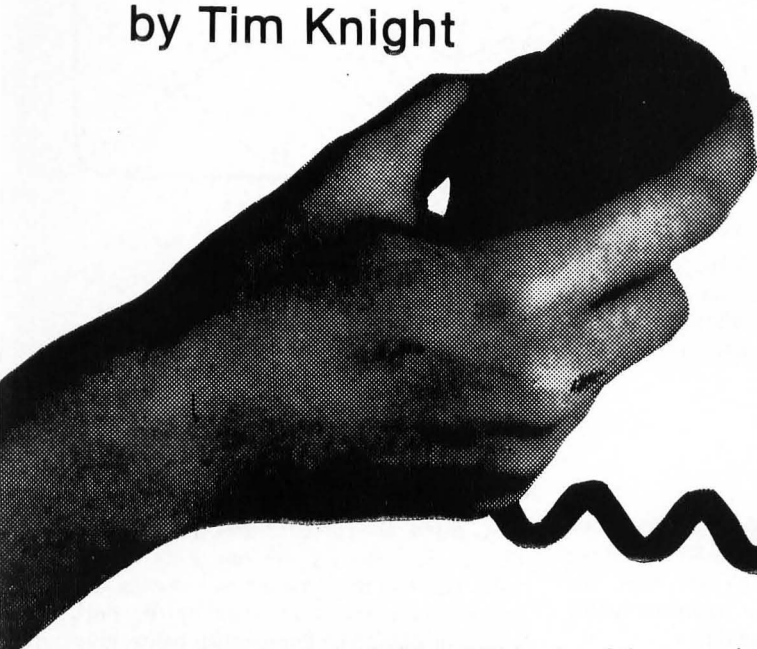
## Apple Quest

The SWAT table failed to state that it was generated using modified parameters NU = 5 and B = 200.

# World Connection



by Tim Knight



Here's how CB works. Since you can't send and receive voices through a computer, you must communicate in a different way. Instead of "talking" with the users on the CB, you "type" to them and they "type" to you. Everything you or they type into the computer can be seen by everyone else, so it's similar to a confusing conversation at a party.

You might wonder if some of the sentences (if you can call them that) relayed back and forth on CB ever get scrambled. Well, the words themselves don't get mixed up, but it can confuse a novice. I've been on CB for quite a while, so I can decipher the five or six conversations weaving in and out of one another. In addition, the CB'ers speak a fairly strange lingo every now and then, which can make it even more confusing. To give you an idea of just what a minute's worth of CB looks like, I'm going to show it to you. You can read my explanation afterwards.

## A Minute of Insanity

(9, Blue Knight) Howdy doo to all  
(9, Daddy Warbucks) Hola BK  
(9, New Wave Gal) Hi Knight  
(9, Ace) Cheers Blue  
(9, Daddy Warbucks) I'm in Tulsa, Ganja, you?  
(9, Blue Knight) Wave, have we chatted before?  
(9, Champie Champ) Body, art thou a lurker?  
(9, Baud-y) Hi Dad  
(9, Luna) AOS Knight  
(9, Blue Knight) Howdy Luna — New Wave Gal?  
(9, New Wave Gal) He flirts so much, he doesn't remember  
(9, Blue Knight) Not nice gal, not nice  
(9, Ace) The flirting Knight  
(9, Blue Knight) Hmmmmm.....  
(9, New Wave Gal) I was only kidding, Blue  
(9, Ace) ZZZZZZZZ.....  
(9, Daddy Warbucks) Y R we on this channel?

What a mess. Still, to the experienced CB'er, it's almost intelligible. First of all, the number and the name at the beginning of each statement is the channel number and the "handle" of the person saying the sentence. For example, my handle is the *Blue Knight*, and I'm on channel 9. Therefore, preceding anything I say is "(9, Blue Knight)." You can also see how my friends changed my handle into things like BK, Blue, and Knight. Abbreviations of handles like this are common on CB.

You may remember that in issue 40 I introduced the two main distribution systems of computer communications — the "little guys" and the "big guys." The little guys are the small bulletin board services, privately owned and operated. The big guys are the large information services, like *The Source* and *CompuServe*, which provide up-to-the-minute data on stocks, bonds, weather, news, and can even carry mail right to your computer's memory.

Over the next several issues, I will discuss numerous aspects of the large information services. This time, I'd like to introduce you to some lighter facets of this fascinating subject. I won't go into Associated Press reports or Electronic Mail. I will, however, tell you about three of my favorite pastimes on an information service (the *CompuServe* service in particular) — CB, private conferences, and Aunt Nettie.

## Breaker 1-9 for A 10-36

You don't have to be a trucker or speak in some strange dialect to enjoy the citizen's band (CB) network of *CompuServe*. You do, however, need to have access to a terminal so you can chat with the dozens of users who might be on the citizen's band at any one time.

CB, as you might have assumed by now, is a computer simulation of Citizen's Band Radio. CB is one of the most addictive features in the *CompuServe* network, and, at \$5 for every hour, it can get pretty expensive. I know people who spend thousands of dollars every year just "chatting" with others on the *CompuServe* CB.

In addition, some alien words must be defined. A "lurker" is a person on CB who just sits and types nothing, which is pretty frustrating to the other users who want as much action as possible. Other words are abbreviated into letters like "Y" for "why" and "R" for "are." Lastly, AOS is just a fancy way of saying "hello." It stands for Acquisition Of Signal.

One of CB's great advantages, besides the interesting conversations that happen there, is the number of friends you make. It's a very social, entertaining experience, and is a lot of fun. If you're interested in CB, just sign up with *CompuServe*. It will guide you right into CB and teach you how to use it well.

### Something More Private

Another service offered on both *CompuServe* and the *Source* is private conferencing, which allows you to talk with a single person or a few of them. The big difference between private conferences and CB is that nobody else can see what you are typing. This is perfect for business people who want their information confidential, and long-lost lovers who need to catch up on sweet nothings over the computer system.

I am most familiar with the private conferences on the *CompuServe* service (which is almost identical to the *Source's* conferencing), so I'll be talking about that here. In either network, though, you would simply tell the computer where you wanted to go, and it would guide you into the conferencing network.

Suppose that you discover an old friend of yours. You can instruct the information service to find your friend's "job number," (the number assigned to that person while logged onto the network) and lock-in on that number for a private conference. Then you and your friend can talk for hours, privately.

Another method of private conferencing doesn't involve an information utility. Sometimes, user-to-user conferencing is more economical (or easier). You use your computer to communicate directly with another computer. You can call a friend, make sure

your computers are communicating properly, and "type" to each other. This is especially handy when planning your next surprise party that another occupant of the house shouldn't know about. Conferencing offers advantages in privacy over CB. Both CB and private "chatting" have advantages, and you can select the one that is right for the time.

### Love, Life and Trivia

*CompuServe* has its own expert on love, life, and trivia — Aunt Nettie ("Nettie" — probably short for "Network"). Aunt Nettie is quite an interesting person. That's right — this is a person, not a computer program. Aunt Nettie answers questions thrown at her every couple of weeks, and often, her answers are very amusing.

### Fun Still to Come

Although I've covered some of the entertaining aspects of the major computer networks, the fun is not necessarily over. I'll continue to discuss other features on *CompuServe* and the *Source*, and I will not forget the "little guys." People find fun in different things, though, and our upcoming columns concerning stocks, bonds, and news may entertain some of the enterprising capitalists out there. We hope you'll continue to join us on *The World Connection*.

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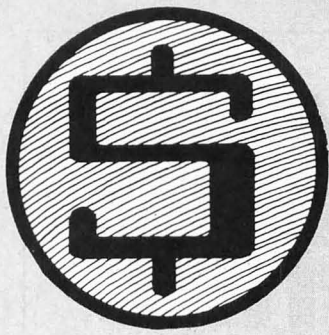
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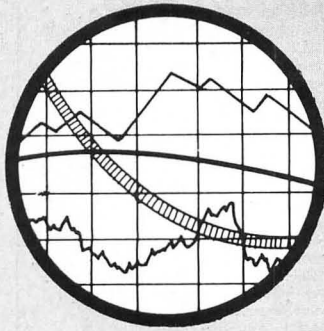
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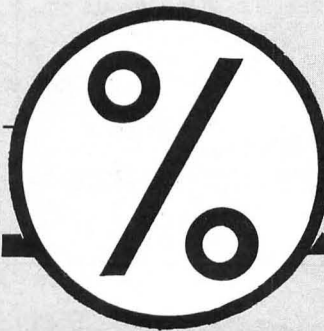
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# CALC



# SSIDE



by David Peters

## The *VisiCalc*® Spreadsheet Comes Home

*...the two models merged in a messy but fascinating way!*

Recently, I made a mistake. I /SLOADED a second VisiCalc model when one was already in the computer's memory and an interesting thing happened — the two models blended and merged in a messy but fascinating way! Deliberate merging (or overlaying, as VisiCalc devotees call it), can be a useful and functional method of operation.

Let's take an example. Suppose you devise a model that records car expenses. (See Figure 1a). Your spouse has been keeping one for the family's second car (Figure 1b), and now you wish to combine the two and add a totals column to get a comprehensive picture of your family auto expense. You could type the second car details into the model for the first, and add the formulae in a new column. Or, you could overlay them.

The procedure is simple. Load one of the templates (we use the second car model in Figure 1c). Move the data column over one to the right by /INSERTing a new column, and then add a column called TOTAL, with a built-in formula that adds columns B and C. Since the column headings and titles of the expense items are identical in each, you need not delete them.

Now for the overlaying procedure. To see the whole thing work, /SAVE this revised second car matrix in the usual way, under a different filename from the original model — call it COMBINED. When this is safely on the disk, /CLEAR the screen.

Now /LOAD the model that contains the data for the first car. Immediately /SLOAD COMBINED. You will see the incoming data move neatly on top of the resident model, and the automatic re-calc give the

right totals. This is a very simple application, but it illustrates the procedure.

There are some important things to remember about overlaying:

- The INCOMING model changes all the global and location settings in the RESIDENT model. The column width of the incoming model takes precedence, as do the format settings of individual locations. Consider this, and match them during preparation.

- Incoming data replaces resident data when each has a location with an entry in it; *but*, if the resident has a filled location, and the incoming has a blank, then the resident will remain undisturbed, and vice versa.

- Naturally the overlays must "fit" one another exactly, and occupy the same area of the matrix. You should prepare the new "incoming" *over* a model of the original, as we did above.

### A Real Example

Here is a useful home application, a vacation planner — really a cost comparison model. The family has several ideas for a vacation, and family members are campaigning for different destinations — Europe, Britain, France and Germany. To



form a basis for discussion, each member is assigned some investigating — they have to determine certain costs for each destination, and report back with them.

Figure 2a is a blank model prepared for each of the countries (Germany is shown, and is on the disk as filename GERMANY). As each member finds a piece of information about the assigned country, the VisiCalc model is loaded, and the data entered. The air fares and the cost of the bus to and from the departure airport are in dollars. The costs of items in Europe are established in the currency of the country, including the estimated average cost of various meals in that country, souvenirs, and so on. So the information gradually accumulates. (There will be lots of other items, but we have simplified).

When all information is collected, a data file is created by deleting the titles in column B in the collection matrix of each country, and saving just the figures in Column C, including the name at the top, the number of weeks planned and so on.

**Fig. 1a. Your car expense summary.**

EXPENSE	CAR 1
PAYMENTS	160.00
GAS SHELL	66.78
GAS MOBIL	44.65
REPAIRS	18.50
TIRES	0.00
MISC	22.45
INSURANCE	26.60
TOTAL	338.98

**Fig. 1b. The second car summary.**

EXPENSE	CAR 2
PAYMENTS	144.00
GAS SHELL	22.69
GAS MOBIL	53.22
REPAIRS	127.58
TIRES	48.00
MISC	5.4
INSURANCE	22.00
TOTAL	422.89

**Fig. 1c. The second summary modified.**

EXPENSE	CAR 2	TOTAL
PAYMENTS	144.00	144.00
GAS SHELL	22.69	22.69
GAS MOBIL	53.22	53.22
REPAIRS	127.58	127.58
TIRES	48.00	48.00
MISC	5.4	5.40
INSURANCE	22.00	22.00
TOTAL	422.89	422.89

**Fig. 1d. The combined model after overlay.**

EXPENSE	CAR 1	CAR 2	TOTAL
PAYMENTS	160.00	144.00	304.00
GAS SHELL	66.78	22.69	89.47
GAS MOBIL	44.65	53.22	97.87
REPAIRS	18.50	127.58	146.08
TIRES	0.00	48.00	48.00
MISC	22.45	5.4	27.85
INSURANCE	26.60	22.00	48.60
TOTAL	338.98	422.89	761.87

**Fig. 2a. The Data Collection Matrix.**

A	B	C	D
	COUNTRY:	GERMANY	
	WEEKS:	3	
	EXCHANGE:	2.41	
	*****		
	ITEM		
	AIR FARE		
	ADULTS	350.62	
	KIDS	99.59	
	BUS/AIRPT	9.00	
	BUS/HOME	9.00	
	CURRENCY	MARKS	
	HOTELS #1	53.02	
	#2	84.35	
	#3	77.12	
	RENTACAR	34.95	
	MEALS		
	BREAKFSTS	4.70	
	LUNCHES	7.23	
	DINNERS	13.50	
	-----		

**Fig. 2b. The country data file.**

A	B	C	D
		GERMANY	
		3	
		2.41	
		350.62	
		99.59	
		9.00	
		9.00	
		MARKS	
		53.02	
		84.35	
		77.12	
		34.95	
		4.70	
		7.23	
		13.50	

(Here's a VisiTip: Instead of /Blanking each entry down the column to delete it, /Replicate the empty column A over column B — it all goes away in one swoop. A useful way to delete large blocks of data is to replicate a similar size blank area over it!)

This new file, an example of which is shown in Figure 2b, is just the data, and is saved as FRANCE.DATA.

Meanwhile the PRINTOUT MODEL has also been created, and will, in effect, be the "final report" of a country. This is shown in Figure 2c; and, as you can see, it has several additional functions built in. (Don't worry about the ERRORS for a minute.) The Factor column is the multiplier that will be applied to the country data. As you can see, there are two adults and two children

**Fig. 2c. The empty printout model.**

A	B	C	D	E
	COUNTRY:			
	WEEKS:			
	EXCHANGE:			
	*****			
	ITEM	FACTOR	DOLLARS	TOTAL
	AIR FARE			
	ADULTS	2	0.00	0.00
	KIDS	2	0.00	0.00
	BUS/AIRPT	4	0.00	0.00
	BUS/HOME		0.00	0.00
	CURRENCY	4		
	HOTELS #1	4	ERROR	ERROR
	#2	4	ERROR	ERROR
	#3	12	ERROR	ERROR
	RENTACAR		ERROR	ERROR
	MEALS	0		
	BREAKFSTS	0	ERROR	ERROR
	LUNCHES	0	ERROR	ERROR
	DINNERS	4	ERROR	ERROR
	-----			
			TOTAL	ERROR

**Fig. 2d. The printout model with the first country loaded.**

A	B	C	D	E
	COUNTRY:	BRITAIN		
	WEEKS:	2		
	EXCHANGE:	.66		
	*****			
	ITEM	FACTOR	DOLLARS	TOTAL
	AIR FARE			
	ADULTS	2	650.00	650.00
	KIDS	2	280.50	561.00
	BUS/AIRPT	4	9.00	36.00
	BUS/HOME		9.00	0.00
	CURRENCY	4	POUNDS	
	HOTELS #1	4	21.78	33.00
	#2	4	27.06	41.00
	#3	12	34.32	624.00
	RENTACAR		14.92	22.60
	MEALS	0		0.00
	BREAKFSTS	0	2.97	4.50
	LUNCHES	0	3.96	6.00
	DINNERS	4	8.25	12.50
	-----			
			TOTAL	2867.00

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**VisiTip: Instead of /Blanking each entry down the column to delete it, /Replicate the empty column A over column B...**

Fig. 2e. Another country for printout.

A	B	C	D	E
	COUNTRY:	FRANCE		
	WEEKS:	2		
	EXCHANGE:	6.82		
.....			.....	
ITEM	FACTOR		DOLLARS	TOTAL
AIR FARE				
ADULTS	2	675.00	675.00	1350.00
KIDS	2	300.00	300.00	600.00
BUS/AIRPT	4	9.00	9.00	36.00
BUS/HOME		9.00	9.00	0.00
CURRENCY	4	FRANCS		
HOTELS #1	4	279.62	41.00	164.00
#2	4	354.64	52.00	208.00
#3	12	709.28	104.00	1248.00
RENTACAR		211.42	31.00	0.00
MEALS	0			
BREAKFSTS	0	20.46	3.00	0.00
LUNCHES	0	47.74	7.00	0.00
DINNERS	4	61.38	9.00	36.00
-----			TOTAL	3642.00

for air fares, four people for the bus, and four for the hotel rooms. Our plan calls for moving around, and we will stay in three different hotels. The meals are covered with a formula that will multiply the number of weeks shown in the top of the country data column by seven. The rental car is estimated on twelve days only.

The error messages in the DOLLARS column are easily explained: the formula sitting there waiting for data divides a foreign currency amount by the rate of exchange to convert to dollars. Since dividing by zero, as it is trying to do now, is forbidden mathematically, you get the ERROR message.

Column C is blank, and you must be way ahead of us by now.

If this model is loaded, and then a country data file overlaid onto it, the automatic re-calc that VisiCalc performs

after a load will divide the foreign currency data collected by the family by the exchange rate first. Then it will multiply the resulting dollars by the factor column, producing the total for each, and a grand total down at the bottom. (We brought in Britain in Figure 2d, printed it, and then, without changing anything, overlaid FRANCE into the same model, and similarly printed that.)

So, you have a simple way to use the overlay principle, and an example of how it may apply at home in a planning situation. To make one big model with each country side by side requires a little preparatory work. We'll show you, in our next column, how to do this, and how to produce a "what if" model that enables you to change the variables to calculate the effect of staying longer, using cheaper hotels, and so on.

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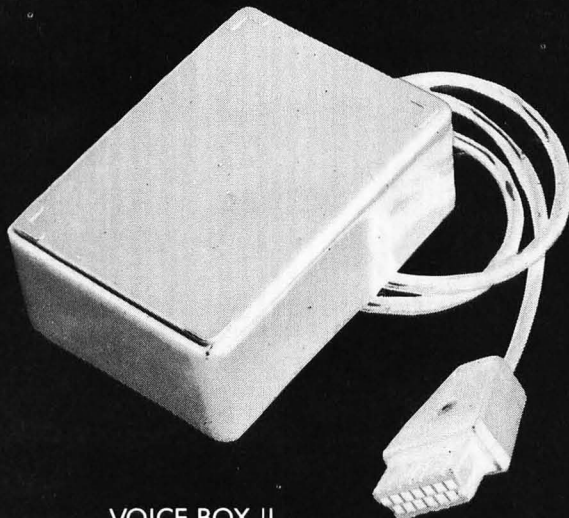
**POPULAR SCIENCE**—"The speech quality is excellent. Besides creating speech, the software has a bit of fun with graphics."

and on the new VOICE BOX II.....

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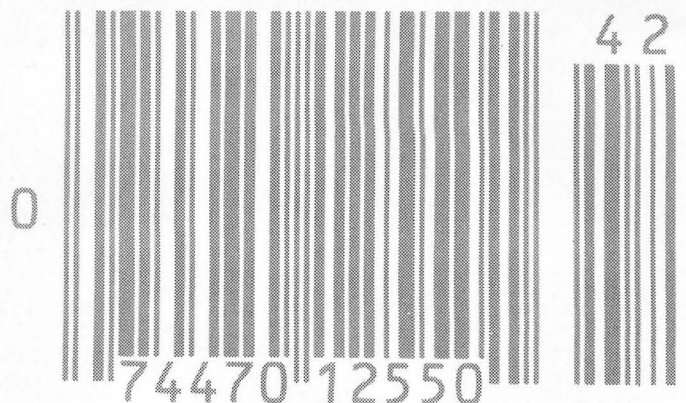
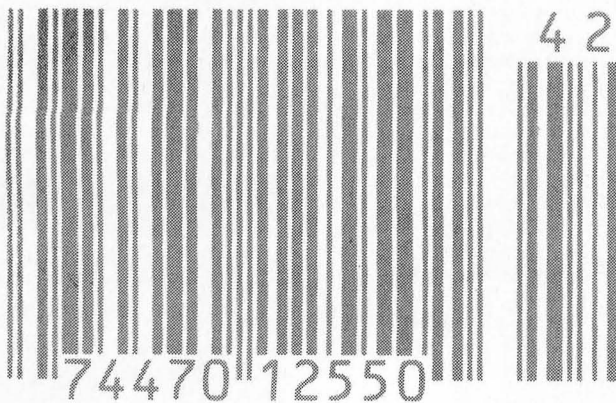
The New VOICE BOX II for ATARI plugs into the serial port of the ATARI 400/800 with sound coming out of the TV/monitor. 48K DISK is required. It has all of the features of the original VOICE BOX plus many exciting new hardware and software features:

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# The Ubiquitous Bar Code



by Allen J. Wold

How many times have you wanted to refer to an article and couldn't remember which magazine it was in, let alone the issue or page?

While preparing the article on alternatives to BASIC for *SoftSide* issue 36, I researched artificial languages, such as Esperanto and Idiom Neutral. I learned *Scientific American* had run an article a while back, on Loglan, a new artificial language developed with the aid of computer analysis of natural languages. Now, I have *Scientific American* going back to about 1960, sitting in stacks in my hall, but I knew it would take hours to find the article in question.

Another time, for a short story, I needed information on how computer chips were made — specifically, the technical terms and chemical compounds used. I knew I had lots of articles, but I had to paw through literally scores of magazines before I found the ones I wanted.

I had given up indexing my magazines, as the task of entering all the articles and their subjects into my computer was too large. It would take a full time data processor months to prepare such an index. Even if I typed in the contents page of each magazine as

it came, it would take time I usually devote to other activities, such as eating and sleeping. I wanted the magazines to provide a bar code index, which I could input with the sweep of a wand.

## Bar Codes?

Bar codes are the symbols grocery stores use at check-outs these days. Each bar code contains groups of lines of varying width, separated by spaces of varying widths. The ratio of wide to narrow is usually about three to one, or two to one. The line length is fairly unimportant. This brief code, called UPC or Universal Product Code, is bracketed by other lines which mark the beginning and end, so the scanner can tell which way it is reading the code. Bar codes can also encode binary or ASCII (American Standard Code for Information Interchange) data.

These codes have been around for only a few years now, but the idea of inputting check-out information via some kind of optical scanner is not new. The University of Pittsburgh bookstore has used a similar system for years. They use a different kind of code and scanner, it's true, but it serves the same purpose.

If all magazines were indexed in bar code, then whenever a new issue came, one quick scan of the last page, or the contents page, or wherever the code was located, would input the entire table of contents, perhaps even annotated.

Once loaded, I could use my data retrieval programs to call up any article I wanted — by author, issue, or a variety of subjects. The contents page of *Scientific American* is a good example of a useful index. Each entry gives the title, author, and a one-line synopsis. Their annual index is broken down by keyword subject. Providing this index in bar code would require more printing, and someone to prepare the key words, but it would be an invaluable service to the reader.

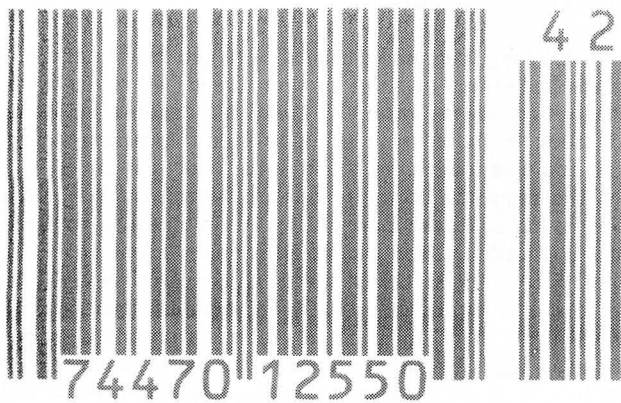
Even fiction magazines could do this. Then, when you wanted to reread a story, you could recall which issue carried it. Short story anthologies could also list their contents in bar code.

The same could be done with other books. Most non-fiction books have an index, or should have. If these were repeated in bar code, they could be stored on disk and you'd have the contents of your whole library, in great detail, at your fingertips.

Libraries could promote such a project. I used to work in a university library, and know all the effort it takes to prepare and maintain card catalogs. Computers are beginning to replace physical cards with computer printout or monitor listings, but each book, as it comes in, must be hand-entered into the system.

The Library of Congress has, for some years now, included cataloging information at the front of books, to assist in this process, but it still requires manual entry into a library's computer. Printing this Library of Congress publication data in bar code would reduce the task immensely.

Libraries, especially research libraries, would benefit from bar code indexes. Finding information based on the subject entries of the card catalog leaves much to desire, since these entries are limited to only the three or four major topics of a book. Printed indexes of professional journals are available but these often appear more than a year after the journals have been published. A bar code index system would make this information available to any researcher as soon as the book reached the shelves.



## What Price Technology?

Bar code readers are fairly inexpensive. To buy the parts to build one which counted lines, and did not distinguish between widths, might cost \$5. Heathkit's robot uses a shafting coder of this sort, so that the robot knows how far its arm is extended.

Texas Instruments® produces an optical reader for its talking books for about \$120. One that only reads data into a computer should cost about \$50 or less, since the *Magic Wand Speaking Reader*, reviewed in *Popular Computing*, December, 1982, includes a voice synthesizer. You'd still need software to interpret the codes.

However, a laser scanner, which converts bars into ASCII codes, and can use an RS232C port, would cost around \$4,000. The more sophisticated scanners imbedded in grocery store check-out lanes cost from \$10,000 to \$20,000 each.

The *Speaking Reader* device is used with special children's books. Each page has a large picture, a line or so of text, and beneath each line, another line of bar code. The wand of the reader converts that bar code into words, so the child can hear what he or she is reading. The books cost about \$12 each.

As most children's books use a limited vocabulary, it would be easy to provide the reader with all the words necessary to read any book for young people, provided that book had bar codes. Larger vocabularies could be kept in ROM (read only memory) packs, much as games are, so that, as the child's vocabulary increased, the reader could keep up.

The Hewlett-Packard® HP 41 calculator can load programs stored in bar code. These are quite short, about 500 bytes maximum, which is plenty for a calculator program, but not much for a computer program. It uses a system very similar to the *TI Speaking Reader*, and is very reliable. A Casio electronic organ can also be programmed by bar code input.



## Bar Codes for the Blind

I've read about book readers for the blind. These devices read printed text and then say the words out loud, using voice synthesis. They're wonderful inventions, but they're expensive. The technology to decode a page of printed type is complex, and varying type styles can prevent the reader from functioning.

In *Interface Age*, January, 1983, Dona Z. Meilack reviewed the DEST deskless work station. For about \$7,000, you can buy a machine that will read a page of typescript and store it on disk or tape for later editing using a word processor. It can read 70 pages an hour. It's about half as expensive as previous machines, and a boon to any office that processes text not created on its own word processors.

If, instead of expensive readers to read type or print, books for the blind were printed in bar code, they would be easier for electronic readers to handle, producing fewer errors, and would not have the problem of varying type styles. Such print readers could

be manufactured to facilitate loading by the blind. A regular book can be loaded into a reader from two directions: right side up, reading from the front, or upside down, reading from the back. Bar code books could be made physically unambiguous, as IBM punch cards are, by clipping a corner.

The actual printing cost, once the text was translated to bar code, would be almost the same as for any other book. Also, the translation from printed text to bar code need not be a large task. With computerized publishing, bar code could be created directly from the text stored on disk or tape. It's a matter of typesetting, using bars instead of letters. Printing a bar code book would be a lot less expensive than Braille, and more permanent and convenient.

An 8½ by 11 page could hold up to about 2K bytes of information, or about 350 words. The bar codes would not be subject to physical degradation, the way Braille dots are. The text could be stored on magnetic medium and read directly, but that's another possibility.

If the blind reader preferred Braille, a device which would reproduce the patterns of dots mechanically, a variation on the device which actually punches the Braille onto the page, could be provided instead of a voice synthesizer. A line of Braille text is created by a series of mechanically driven rods, each rod projecting above the tactile surface a tiny bit, in imitation of the punched paper. Such a device has been demonstrated on Canada's high-technology TV program, *Fast Forward*.



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## SoftSide In Bar Code

Right now, if readers of *SoftSide* want to load the programs published in the magazine, they have two options:

- They can subscribe to the Disk Version of the magazine which, while eminently convenient, is expensive and subject to certain hazards in mailing, handling, and storage.
- They can type in the programs by hand. This is inexpensive but tedious, and subject to errors of typos, copying, and comprehension.

How about bar codes of all programs listed in the magazine? This alternative offers permanence, economy, and ready accessibility. Some programs are quite long, and typing errors creep in no matter how careful you are. But, once the program is tested and debugged, instead of listing it for paste up in the magazine, it could be translated directly into bar codes, without human intervention and error. This would ensure a more reliable way to enter your programs.

The problem is that, to ensure a good scan, using a ruler as a guide, the codes would need longer lines, limiting them to about ten columns per page, or about 500 bytes. Also, practice verifies that the average manual data input rate is about ten characters per second, or as "fast" as an old fashioned paper tape reader.

In the May, 1982 issue of *Creative Computing*, a reader asks why the programs in that magazine couldn't be printed in bar code as well as regular listings. An editor with the initials "GB," replied that the bar code was suitable only for small units of information — or short programs — and goes on about marketing cost and the cost of a reader. My comments on the *Speaking Reader* answer some of his objections.

In fact, books of computer programs in bar code are already available. I have a copy of *Basex*, a simple language and compiler for 8080 systems, by Paul Warne, published by Byte Books. Briefly, *Basex* is a language which is a sort of cross between BASIC and assembler. Fewer than 22 pages describe the language and its use. The major portion of the book is a listing, in 8080 assembly or *Basex*, of the compiler, execution routines, and loader. (I'm not enough of an Assembly programmer to try it out.) Even more interesting is that the book also includes *PAPERBYTE™* bar code format of the object code for the compiler, routines, and loader.

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## Chickens and Eggs

Carl Helmers, now at North American Technology Inc., provided me with much hard data on bar codes. He, with Walter Banks, originally helped convince *Byte* magazine to experiment with bar code listings. *Byte* no longer uses these because of what Carl calls the chicken or the egg problem. At the moment, it is useless to provide bar code listings, because so few people have scanners. On the other hand, few people will buy scanners without bar coded programs.

Microcomputer programs are available that read and interpret bar codes. These are used by hobbyists or systems developers more often than the typical home computer user. The low demand for inexpensive readers keeps the costs high, and the number of home applications low. However, light pens are becoming common these days, and the same could happen with bar code scanners. Also, library applications could help create a demand for the scanners.

For very long programs, this method would be less satisfactory. But for collections of short programs, such as *1001 Games in APL*, or *Crafting in Color with Cobol*, bar codes would be ideal. Such books contain up to a hundred short programs, each of which could be loaded easily with a bar code scanner.

At the moment, however, because of the chicken and egg problem, bar codes are more likely to serve industrial rather than home applications. The Patent Office uses a bar code, called Code 39, to mark each folder with patent application information. These codes are about 20-30 alphanumeric characters long. Besides at the check-out counter, grocery stores and other places that have a large shelf stock use a non-UPC shelf tag to help track inventory. Certain factories and warehouses mark boxes with a bar code, read by automated carriers and sortation machines. All these applications accomplish physical item tracking, and improvements are being made all the time.

I have hopes, though, that one day bar code readers and programs will be feasible for home use. I still have twenty years worth of *Scientific Americans* to catalog. ☐

# ADVENTURING IS BEST!



by Judy Neyhart

Adventure! The word conjures up pirate movies on the high seas, or cowboys on white horses riding across the desert after bad guys. Adventure with a computer — that's another story. How can computer-generated graphics and text on a small TV screen cause the heart to flutter or the pulse to rise? The computer has again surprised me with its capabilities.

When I wrote "Eye Hand Coordination" (*SoftSide*, February, 1981), my then 11-year-old son was into computer games. *Asteroids*, *Invaders*, *Pinball* — he had mastered them all. The names have changed since then, but the eye/hand coordination he got from them was invaluable. Those games were entertaining, but now he is hooked on the adventure.

Our first experience with the adventure genre came with the Microsoft *Adventure*, — the cave beneath the grate, the dwarves at work, and the face in the window — by Crowther and Woods. We never solved that one, but the bug had bitten. The most prolific adventure genius, in those early days, was Scott Adams of Adventure International. The flaming windows, eerie noises in the fireplace, idols and exploding chemical tubes in *Voodoo Castle* fascinated us. (Maybe I liked this one because it was written by Alexis Adams and dedicated to all Moms!) The way these adventures, numbered one through ten, use simple text displayed on the screen to conjure up fantasies is amazing! Computerized story telling was new to everyone and Scott Adams was a master. (His adventures have been rereleased with graphics to accompany the same imaginative storylines.)

## Graphic Adventures

*The Wizard and the Princess*, by Ken and Roberta Williams, of the former On-Line Systems, was the precursor of the great graphics adventures of today. The screen "drawings" with color graphics, painted a stage for the intrigue of finding the missing princess. One problem was how to get out of the desert and escape the mean-looking snake that blocks your way out of Serenia. You've spent your money, your competitive spirit has been challenged and you're stuck already!

But wait! At the end of the documentation is the following suggestion: "If all else fails and you're totally stuck and about to burn the adventure disk, check with your favorite store for a

---

***How can computer-generated graphics and text on a small TV screen cause the heart to flutter or the pulse to rise?***

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hint." Extreme humiliation followed. We couldn't wait for an answer, so we telephoned our nearest store. The voice on the other end of the line said, "What? How do you get past the snake? Just a minute..." I heard muffled voices through the line, but I could make out enough of what they were saying to make my face blush. "Hey Joe. Some lady wants to know how to get past the snake. What is she talking about?" Fortunately, someone in the store was an adventure nut, too, and came up with exactly what we needed to know. (I have never forgotten that experience, however, and my son makes all the little hint phone calls now. He's impervious to mildew, rot, and embarrassment!)

Solving *The Wizard and the Princess* did not end there. It required another two years, off and on. When we arrived at computer club gatherings, we could always break the ice by saying, "Who knows how to plug the hole in the boat?"

continued on page 21



# SoftSide Back Issues...

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## Adventuring is Best, continued from page 19

When *Odyssey: The Compleat Adventure* by Robert Clardy of Synergistic Software came, we had to cope with a new vocabulary from our role-assuming son. "How many quadrooms will I get for my allowance?" and "What are we having for dinner, M'lord?" It had color graphics and a detailed map. We met warlocks, allesauri, and hermits.

## Games Get Better

Some of the newer game techniques have solved the laughs-in-the-ear phone call problem. The games respond to "HELP" or "HINT, PLEASE". Sometimes, you can get enough new information to help you out of a tough spot. *Escape from Rungistan*, by Bob Blauschild of Sirius Software, came with music and moving objects. When the mouse runs across the screen, you hear the the familiar tune, "M-I-C-K-E-Y M-O-U-S-E." There are, however, no colors, so the final hurdle was not cleared. Then came *The Mask of the Sun* from Ultrasoft. With that we had sounds, color graphics, an excellent mystery to solve, and movement — and *what* movement! A statue turns into a cougar before your eyes, and apparitions appear and vanish. No, we haven't made a phone call yet, but we have encountered many dead ends...


When I volunteered to teach the art of computing to an after school class of third and fourth graders, I analyzed what I would present in four sessions. We studied graphics, music and educational games, but the topic they loved most was the adventure — specifically the one from Scott Adams, *Voodoo Castle*. My students would burst into the room, before the class, with suggestions — you could tell they had thought about the mystery. "Why don't we try prying open the window with our bloody knife?" or "I think we should get the sapphire from the door!"

Along with an idea for the next move came the need to come up with the right vocabulary. Each command had to be entered in two-word form, such as "open door" or "up stairs." Some words worked better than others in a certain case like "look statue" instead of "look Ju-Ju." (The object is a ju-ju man statue. What's that, you say? You'll have to play to find out...) With these nine- and ten-year-olds, as with any child, attracting their attention and getting them to think was the greatest way to make learning fun.

## Games and Skills

In five years of adventuring, I watched my son's progress through the formative elementary years. Adventuring has helped him in the following areas:

- Adventures have greatly improved his vocabulary. Where else could he learn about apparitions, sarcophagi, chain mail, mediums, and so on?
- Adventures have helped develop his logical thinking. He learned to solve problems in proper order, such as attaching the rope to the anchor first, in order to throw it to climb up to the tree house.
- Adventures have whetted his appetite for reading. He has become a great fantasy/fiction fan since Apple adventuring became a part of his life.
- Adventure games have stimulated his imagination and, therefore, improved his creative writing abilities.
- Lastly, adventures have proved to him that his parents are valuable. He doesn't need me to break all scoring records in *Space Invaders*; but, when he gets stuck on an adventure, my fantastic mind (or, if you will, another opinion) can help him get past any obstacle (almost).

Adventures have come a long way since the grate in the woods, but computers are capable of almost anything. Maybe someday we'll have an adventure that will splash water in your face as you sail across the briny foam. Where's my towel? 



Good grades and clear thinking start with verbal statements — WORDS! Precise words — right words — new words. Now, PDI offers a gallery of family-oriented word games — programs that intrigue, tease and delight the entire word-wise family.



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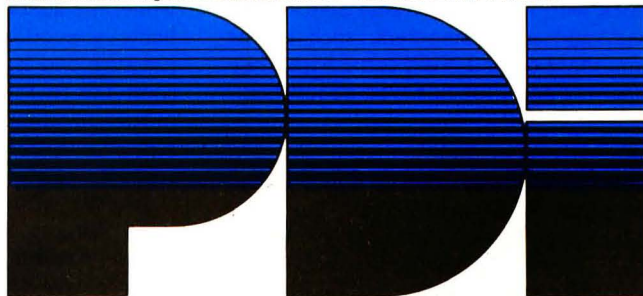


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Program Design, Inc. 95 East Putnam Avenue, Greenwich, CT 06830

# JOYSTICK



The Atari Joystick manufactured by Atari, Inc., 1196 Borregas Ave., Sunnyvale, CA 94086.

## ALTERNATIVES

By Sheldon Leemon

There is very little standardization of microcomputer peripherals. This makes it difficult, if not impossible, to use these devices interchangeably on different systems. In one important area, however, a new standard appears to be emerging — the Atari joystick controller. With millions of VCS systems currently in American homes, this simple input device has become a force to be reckoned with. Several manufacturers have designed units to interface the Atari joystick with Apple and Radio Shack computers, and new computers, such as the Commodore 64 and VIC, come with plug-compatible ports for this type of joystick.

### The Atari Joystick

Although superior to many previous controllers, the Atari joystick still has some serious drawbacks. First, it is strictly pressure driven. By moving the stick to one side, a plastic rod pushes a pad on a circuit board, which closes a switch. The pad is fairly resistant to pressure, so that when

you release the stick, the pad pops back up, and the stick centers itself. As a result, however, the stick is fairly unresponsive — nothing registers until you apply sufficient pressure to close the switch. Since the pad resists pressure, the amount of travel afforded the stick is limited. This gives the controller a stiff feel.

An associated problem is durability. Because the feel is stiff, many players push harder to get a faster reaction time. After a while, the action becomes looser. Far from being a good sign, this signals that the pressure pad is pooped, and the stick will soon fail to respond to presses in one or more directions. An enthusiastic game player will find the life span of these joysticks relatively short.

Another problem with the stick is the hand fatigue it causes. There are two general positions in which the right-handed game player can hold the stick. Grasping the stick handle in his right hand, he can hold the base in his left. Or, he can put the

base on the table or floor, and use his left hand to steady the base against the flat surface. In either case, while the left hand attempts to keep the base steady, the right hand jerks the stick around in order to register the press. In other words, the right hand is always trying to tear the base from the grasp of the left. Since the right hand has the leverage of the stick, the left must work much harder to steady the base, all the while holding it in an awkward position. The resulting fatigue is nature's way of telling you to turn off the TV.

In the paragraph above, I referred to the right-handed player. That is because the fire button is on the left side of the base. The left-hander has the choice of either rewiring the stick (fairly easy, because the plug mates with the circuit board using little clip-on connectors), or becoming ambidexterous in a hurry. When you are talking about several million users, this is not a small oversight.

## The Race To Build A Better Joystick

Entrepreneurs have been quick to spot these defects. As a result, in the last few months, a whole new joystick industry has emerged. There are literally too many participants to cover them all, but I will try to touch on some of the more prominent players in this new game, and their entries in the quest to find the perfect joystick.

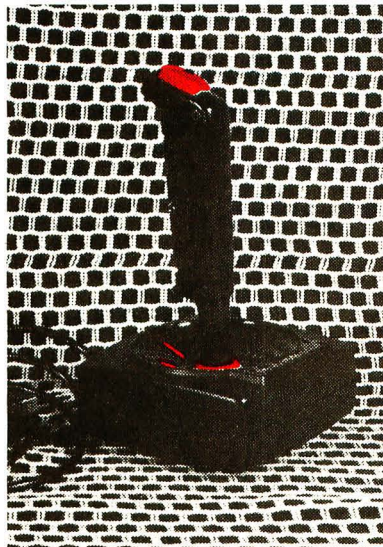
One of the first on the market was *Le Stick* at \$24.95. Produced by Datasoft, a software firm, this stick represented a totally new approach. It is strictly a one-handed device, with gravity-switches to indicate the direction of motion desired and its fire button on top of the stick. You physically point the whole stick in the desired direction. This completely eliminates the problem of opposite-hand fatigue and gives equal time to lefties. *Le Stick's* major problem is switch sensitivity. Even holding the stick straight up is not easy. Fast direction changes can be a problem, particularly for someone just getting used to the stick. Datasoft provides a special switch to help with this by disabling the stick when you squeeze it. Even so, you may need as much skill to use this stick accurately as you need to play most arcade games. Though some swear by it for games like *Star Raiders*, others just swear.

Another stick without a base is the *Zircon Video Command* stick (\$14.95), designed around the controller used in the long-defunct Fairchild home video games. It has a triangular knob, set close into the handle, which you push to close the switches. This knob is spring-loaded, and has very loose action. While response time is good, accuracy suffers somewhat. The knob's shape (triangular) is such that in order to grasp it, you have to assume a position that can, over time, become uncomfortable. Older models of this stick had a firing mechanism activated by pushing the knob head down, plunger-fashion, introducing so much play into the system that accurate control was impossible. Fortunately, Zircon changed the design, and there is now a small fire button on the stick itself. They have also recently introduced a model with a round knob, instead of the triangular one. These changes have significantly improved the product, and those seeking a more comfortable grip should seriously consider this stick.

Spectra Video, makers of the *Quick Shot* (\$14.95), started as manufacturers of VCS cartridges. They quickly branched out into computer software, as well as the manufacture of a very interesting new home computer. Their stick is similar to the Atari model, with a couple of interesting twists.



**Le Stick** manufactured by Datasoft, Inc., 9421 Winnetka Ave., Chatsworth, CA.



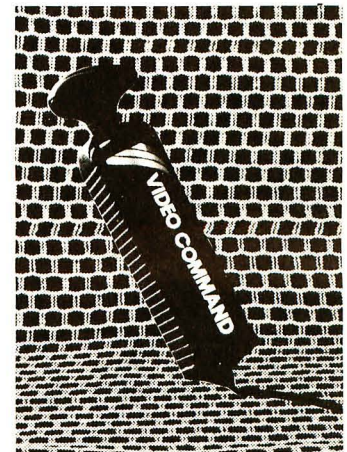
**The Pointmaster** manufactured by Discwasher, 1407 No. Providence Rd., P.O. Box 6021, Columbia, MO.

First, they replaced the stick shaft with a hefty plastic handle molded to fit a large adult hand. Second, they placed a fire button on top of the handle, as well as one on the base. Both are operational simultaneously. Most interesting of all are the four rubber suction cups inserted into the base to make it stick to a smooth surface. Given the rather long base, you can't hold this stick in your hand for a long time without fatigue, but a suitable surface on which to stick the base solves this problem. The stick itself has a comfortable, loose feel.

A similar one-handed stick is the *Pointmaster* (\$16.95) from Discwasher. Perhaps



**The Quick Shot** manufactured by Spectra Video, 39 West 37th St., New York, NY 10018.



**The Zircon Command Control Joystick** manufactured by Zircon International, Inc., 475 Vandell Way, Campbell, CA 95008.

spurred on by the spectre of Digital Audio Discs that never need cleaning, this manufacturer of phonograph accessories decided to diversify. This stick has a sleek design with a very tall handle, and one fire button on top. The handle's height gives the user good leverage — perhaps too good when trying to hold the square base in the opposite hand. To alleviate this difficulty, Discwasher has announced a Pro model with suction cups like the *Quick Shot*. This model will also feature a rapid-fire button. The button adds a continuous firing capability to games requiring that you release the button before firing again, by electronically opening and closing the fire switch at a rapid rate.

# Lost Continent



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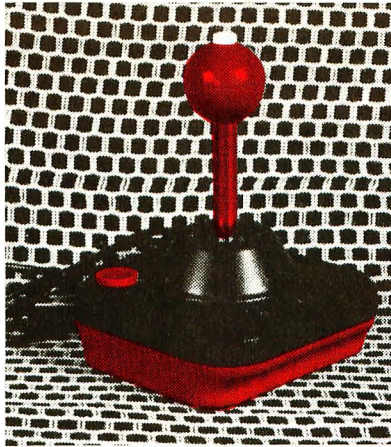
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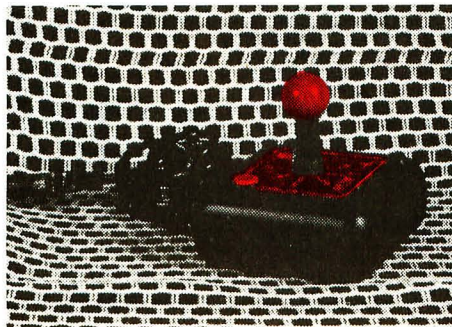
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The Wico Command Control Joystick manufactured by Wico Corporation, 6400 W. Gross Point Rd., Niles, IL 60648.



The Wico Red Ball Joystick manufactured by Wico Corporation, 6400 W. Gross Point Rd., Niles, IL 60648.



The Silk Stik manufactured by Suncom, Inc., 270 Holbrook Dr., Wheeling, IL 60090.

Wico has been cooking up variations on their basic stick. The *Famous Red-Ball Joystick* (\$34.95) has a red ball at the top of the handle, and the *Joystick Deluxe* (\$39.95) has a larger, heavier base. After the successful introduction of the Discwasher stick, a new Wico model appeared with a molded grip, looking very much like the Discwasher. Wico also markets adapters enabling you to use the stick with the Texas Instruments Home Computer, the Apple® II, and the TRS-80® Color Computer.

Although some manufacturers think that a larger stick is the answer, others feel that smaller is better. Suncom Inc., has come out with two models, each with a rather short stick mounted on a small base. The

#### Joystick Alternatives, *continued*

If the *Wico Command Control Joystick* (\$19.95, Wico Corporation) looks like the genuine arcade article, there is a good reason. Wico claims to be the "world's largest designer and manufacturer of control devices for commercial arcade games." The controller consists of a long arcade-style bat handle grip, set on a square base. The stick handle is about an inch longer than Atari's and is made of metal, covered with red plastic. The switches are leaf-type, and spring-loaded to provide self-centering. The base is of heavy molded plastic, and is larger than that of the Atari controller. The base also has a recessed ridge in the front and back, which makes it slightly easier to grasp with the opposite hand. It has a fire button on the left side, and a button in the handle that can be switch-selected. Wico claims that this arrangement prevents unintentional firing of the remaining button, but I think that it would be more convenient to be able to alternate firing of the buttons. At any rate, both buttons are very sturdy, and very easy to push. The stick is quite responsive, compared to Atari's, and that helps to reduce opposite-hand fatigue, as does the size and shape of the base. The spring return provides good tension, which aids accuracy. In short, this stick is a very classy item. It not only has a good feel, but is built to outlast your hand.

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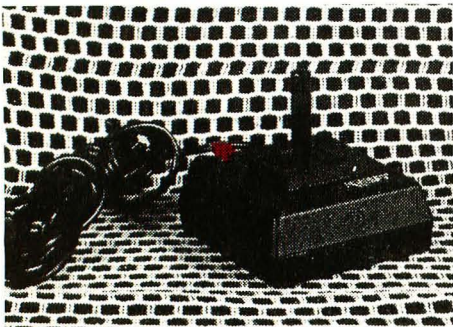
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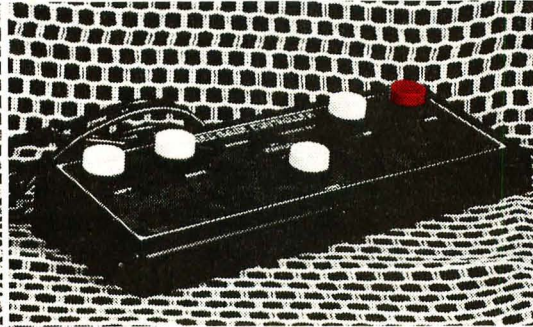
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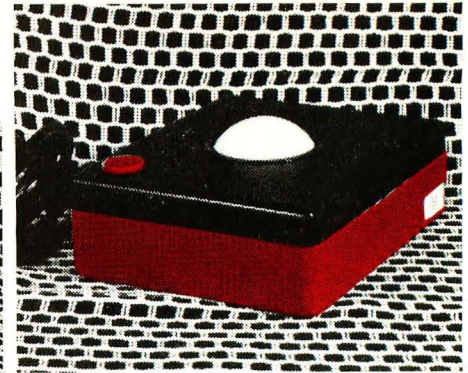
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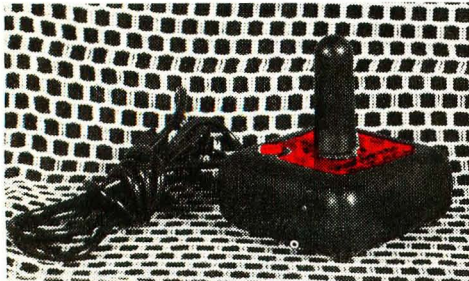
The Kraft Atari Joystick manufactured by Kraft Systems, Inc., 450 W. California Ave., Vista, CA 92083.



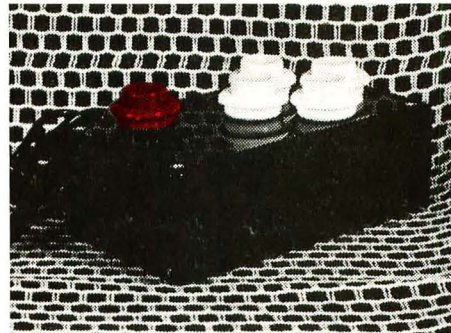
The Starplex Controller manufactured by Starplex Electronics, Inc., Liberty Lake, WA.



Wico Trackball manufactured by Wico Corporation, 6400 W. Gross Point Rd., Niles, IL 60648.



The Starfighter manufactured by Suncom, Inc., 270 Holbrook Dr., Wheeling, IL 60090.



The Fingertip Controller manufactured by KY Enterprises, 3039 E. Second St., Long Beach, CA 09803.

### Joystick Alternatives, *continued*

*Slik Stik* (\$9.95) has a little red ball on the stick, but I prefer the plain stick on the *Starfighter* (\$14.95). This stick is so short that you have to grasp it between your thumb and forefinger, but the base fits comfortably in the palm of your hand. The *Starfighter* combines a short throw with a stiff action, making it a highly accurate and maneuverable stick. In addition, the *Starfighter's* two-year warranty speaks well for the confidence of its manufacturer in this stick's durability.

Although in the same size class, the *Kraft Joystick* (\$16.95) is designed more along the lines of the controllers which Kraft manufactures for the Apple. It has a pencil-thin stick and a very loose action, favoring responsiveness over accuracy.

Not all joystick alternatives have sticks. The *Starplex Controller* (\$29.95, Starplex Electronics) and the *Fingertip Controller* (\$19.95, KY Enterprises), have four buttons for direction control and a fire button. The arcade fanatic, who demands exact duplication of coin-op conditions for games like *Asteroids*, should welcome these controllers. Of the two, I like the Starplex model, as the buttons are laid out in a straight line like most arcade controls. The fingertip controller has them bunched together in a diamond pattern, with no indication of which way is up. Also, the *Starplex Controller* has a battery-powered, rapid fire option, which can be switch selected. Obviously, however, neither "button-box" is a satisfactory substitute for a joystick in all situations — don't try to play *Pacman* with one!

### How About A Trackball?

The *Wico Trackball* (\$69.95, Wico Corporation) consists of a base with part of a billiard ball sticking through at the top. You spin the ball in the direction of travel. While the true arcade trackball is more of an analog device (i.e., the amount of motion is proportional to the spin of the ball), this ball really works as a "joystick emulator." You must spin the ball in order to move. As a result, it is not as fast as the arcade version.

### Joystick Accessories

In addition to a wide assortment of actual joysticks, there are many joystick accessories as well. Take, for instance, the *Stick Stand* (\$6.95, CBS/K-Byte), designed to overcome some of the Atari Stick's drawbacks. It consists of a black plastic base into which you set the base of your Atari stick, and a red knob you place at the top of the stick. The combination allows one-handed operation with more leverage. Although this increased leverage gives you more response and better control of the stick, it also increases wear and tear. I have already heard it nicknamed "The Stick Breaker." With the life of an Atari stick so short anyway, however, you might want to make the most of what little time you have. Another accessory is the *Rapidfire 1* (\$9.95, Gammation), which gives rapid fire capabilities to your Atari or Wico stick.

These alternative controllers are sure to be just the first of many. It remains to be seen, however, which, if any, of these new entries will prevail. The individual reaction to a particular controller is so subjective that no single controller will have the best "feel" for everybody who uses it. Although I have tried to state objective reasons for my opinions, only exhaustive test-zapping will allow you, in the end, to decide which one you like the best. 59

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# Financial Operating System

by J. M. Keynes

## “Deal with things like they is, not like they ain’t.”

**W**ill Rogers once said, “Our problem is not ignorance. It’s all the things we know that ain’t so.” The country philosopher never heard of a computer, but the quotation applies to everyone’s personal computer — his brain.

Consider this: You do most of what you do exactly as you have always done it, and you do it unconsciously. You store thousands of programs in your brain which dictate your responses to stimuli. Cerebral data banks remain constant, and if I could access yours, I could *predict* your behavior.

The longer a program resides in your memory, the more difficult it is to modify. For example, you have a 30-year-old program which says, “My mother loves me.” Mom would have to treat you very badly for you to modify the program to read “My mother does not love me.”

Thousands of investors who owned International Harvester stock in the 50’s or 60’s created a tape which said, “Harvester is a growth stock.” The fact is that HR stopped being a growth stock ten years ago. It is worth 60 per cent less today than in 1971, but prices have tripled.

HR was indeed a growth stock until the mid-70’s when disaster struck. Here was a stock that had paid dividends on its common stock for 50 years. How could anything go wrong with such a sound company? Between the unions turning the screw, poor management decisions and a drop in demand for their heavy farm equipment, HR is on the verge of bankruptcy! Many investors who had owned HR for many years had to come to grips with the facts of life. Even if HR survives (I think it will), those who bought it with 1970 dollars will never get even in purchasing power.

### Aberrations

**I** have often been puzzled by the “Dr. Jekyll/Mr. Hyde” behavior of investors. Examine this: In your business world, you would never keep an employee on the payroll who was unproductive. You would make a simple, uncomplicated business decision...You would fire him. If you had merchandise on the shelf which cost you \$5 and you had priced it at \$10, and it didn’t sell, you would reduce the price to a point where it would sell. You would never buy more of it.

Use these constructive behavior patterns in the market? When you buy stock, you are not buying a company. You are hiring management to manage your money. If they do a good job, you retain them in your employ. If they do poorly, you should deal with them like the unproductive employee. Fire them (sell). I have seen investors fire their most productive employees (stocks) and retain the unproductive ones, and in some cases, buy more (gasp). A disgraceful way to behave, but many investors totally abandon the constructive patterns that got them where they are.

An interesting feature of successful people is their ability to modify programs when clear evidence indicates they should. Unsuccessful people, like the dinosaurs, are unable or unwilling to adjust to changing conditions.

### Some Things We Know That “Ain’t So?”

**O**ver 30 years ago, I was sitting on the front porch of Grandpa’s house in Waco, TX. He filled his pipe with Prince Albert smoking tobacco and offered a young man some sage advice. He said, “If you work hard and save your money in the bank, someday you can retire and live a carefree life, just like I do.” Such advice had worked for his forebears and he saw no reason to think it would fail his progeny. The advice was sound and worked for many years. Thereupon I saved a program which withstood time for 20 years.

Grandpa predicated his advice upon a belief that if one could increase the money in his savings account each year, all would be well. He was right during all those years when inflation was one half percent. Any banker would have agreed with Grandpa. Many still do.

Until recently, the expression “purchasing power” was seldom used. Today if you evaluate investments solely on the basis of dollar increase, you are courting financial disaster. How much money you make from an investment is irrelevant. The only useful criterion today is, “How many loaves of bread will it buy?” compared to last year.

Another of Grandpa’s gems was, “If you want to be a success, learn to deal with things like they is, not like they ain’t.” That advice will be good forever.

The Program Listing requires one entry, an estimate of the inflation rate. The results of fixed income investment will change depending on what happens to the inflation rate. If it declines you are better off, and vice versa.

In 1975 I spoke of the specter of a \$1 loaf of bread by 1980. Many chuckled. Today I speak of the \$3-\$5 loaf by 1990 and no one laughs anymore. I hope a miracle happens, but if you had to bet \$100 on whether a loaf of bread would be more or less expensive one year hence, how would you bet?

Inflation has forced us all to take risks. There is no “risk free” investment which you can count on to return more after the purchasing power than what you started with. Run any guaranteed investment you like in the program and all return more money but less purchasing power. The six percent savings account is a certain path to poverty. There are ways to increase investment without increasing the risk.



## Increase Your Bankroll

If you have \$1000 or more in a demand savings account yielding six percent, you may, with little more than a stroke of the pen, increase your yield by five to thirteen percent, depending on conditions. If you have not yet discovered money market funds you throw money away every day. They are instantly liquid, just like your demand account at the bank or savings and loan. Every major stock brokerage firm has one as well as many independent mutual fund companies. They are safe, liquid, and "no load," which means you pay no fat commission to the salesman. The *Wall Street Journal* publishes many ads daily. Call one of the toll free numbers and get a free prospectus for the details. Some even offer free check writing privileges. If you can earn an extra eight percent on just a \$1,000 investment that is another \$80 per year. For free. Are you so rich that you can pass up a nickel lying on the sidewalk?

Thousands of you have life insurance policies with cash value. Read the fine print and you will find that you can borrow that money at five or six percent. An old program probably says, "Never borrow on life insurance except in emergencies." Nonsense. You have been loansharked for years by those who borrow low and lend high. Why not do a little loansharking yourself? Borrow up to the hilt at five to six percent, and loan it out at fourteen to sixteen percent to a moneymarket fund. Millions of people are missing this easy, risk-free way to make money (much to the delight of insurance companies who like loaning out your money at seventeen percent).

If you are about to invest \$25,000 or more in a short term CD, check the rates on commercial paper. Commercial paper is a promissory note issued by a company for a term of one to 270 days. It is only as safe as the issuing company. A number of times within the last few years, Moody's has rated commercial paper "prime #1" (the highest rating). It yielded three or four percent more than CDs. Your banker or broker can quote the rates every business day. The commission is small. A \$100,000 transaction costs \$25. Your banker is familiar with commercial paper although he may have failed to mention it to you.

## Stock or Bond

If you are about to purchase some common stock, ask your broker to determine if the company issued any convertible bonds or preferred stock. Sometimes you can invest in a convertible and have all of the upside potential of the common stock, yet bear only ten to fifty percent of the risk. Here is an example: In April of 1981 a client called with an order to buy 4000 shares of Louisiana Land Offshore Exploration (an offshoot of the giant Louisiana Land and Exploration). The price of the stock was \$12.50. I checked for a convertible. The company had a four percent bond which was convertible into 80 shares of the common stock.

Examine the arithmetic. The bond was selling for only \$5 over parity (what it was worth in common stock: 80 times 12.5). If the stock went to \$20 per share, the bond would be worth 20 times 80 or \$1,600, the same profit you would realize from owning 80 shares of the common stock. If, on the other hand, on October 1, 1982 the common was down to \$6 per share, the bond holder would get his money back (the bond matured) while the common stock holder would suffer over a 50 percent loss.

Further, the bond holder would collect about \$75 in interest payments while the common stockholder collected nothing as the company pays no dividends. The commission on 4,000 shares of common at \$12.50 per share would have been over \$500. The commission on 50 bonds was \$250.

As this was written, the stock (over the counter symbol is "LLOE") was quoted at about \$7 per share. Instead of worrying

about a current loss of over \$20,000 on the common, my client knew he would get all his money back on October 1, 1982. If the stock rose in price to over \$12.50 per share in the meantime and he could cash in for a profit. This is not a story of a big killing, but was it Ben Franklin who said, "A penny saved..."

In the future I will badger you about examining your alternatives before you invest. "How can I examine alternatives if I do not know about them?" you ask. Just keep up your subscription and I will show you many alternatives. I may tell you of a stock currently selling for \$19 per share that, if the company was liquidated tomorrow, would fetch over \$100 per share. I do not support my two million dollar home and expensive wife by writing articles.

In future FOS columns you may expect the following:

- The "Have your cake and eat it too investment." A discussion of convertible bonds and preferred stock. As this is written, a number of convertible securities possess all of the upside potential of the issuer's common stock with little of the downside risk, and, some pay interest of up to 20%.
- A commodity trading system that has not had a losing year for ten years and averaged over 50% return yearly. I'll include a 15K program and you can run it yourself.
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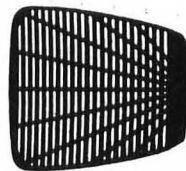
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140 GOSUB410: IF I$="" THEN140
150 CLS: PRINT "THIS PROGRAM ALLOWS YOU TO DETERMINE THE ACTUAL RESULTS OF YOUR INVESTMENT IN TERMS OF PURCHASING POWER."
160 PRINT: PRINT "FOR SIMPLICITY, WE SHALL ASSUME THAT A GALLON OF GAS NOW COSTS $1.00 AND WILL INCREASE IN COST AT THE ESTIMATED RATE OF INFLATION."
170 PRINT: PRINT "IT IS FURTHER ASSUMED THAT YOUR YEARLY DIVIDENDS, INTEREST, ETC. ARE REINVESTED AT THE RATE OF THE ORIGINAL INVESTMENT."
180 PRINT: TAB(4); CHR$(31); "AMOUNT OF YOUR INVESTMENT IN ($)"; TAB(34); INPUT I$: A=VAL(I$): IFA<=0 THEN180
190 I$="": PRINT: TAB(7); CHR$(31); "NUMBER OF YEARS"; TAB(34); INPUT I$: Y=VAL(I$): IF Y<=0 THEN190
200 I$="": PRINT: TAB(7); CHR$(31); "YEARLY RETURN IN (%)"; TAB(34); INPUT I$: R=VAL(I$): IFR<=0 OR (R<=0 AND LEFT$(I$,1)<>"0") THEN200
210 I$="": PRINT: TAB(8); CHR$(31); "YOUR TAX BRACKET (%)"; TAB(34); INPUT I$: TB=VAL(I$): IFTB<=0 OR (TB<=0 AND LEFT$(I$,1)<>"0") THEN210
220 T=(100-TB)/100
230 RR=R*T/100+1
240 I$="": PRINT: TAB(8); CHR$(31); "ESTIMATED RATE OF INFLATION (%)"; TAB(34); INPUT I$: B=VAL(I$): IF B<=0 AND LEFT$(I$,1)<>"0" THEN240
250 BB=B/100+1
260 C=R*T: Z=1: I=A: Q=A: GOSUB440: Q$=I$
270 A=A*(RR**Y): I=A: GOSUB440: A$=I$
280 Z=Z*(BB**Y): I=Z: GOSUB440: Z$=I$
290 X=A/Z: W=X/Q: V=(1-W)*100
300 CLS: PRINT: PRINT "TODAY, YOUR $"; Q$; " INVESTMENT BUYS"; Q; " GALLONS OF GAS."
310 PRINT: PRINT "IN"; Y; " YEARS, YOUR INVESTMENT WILL HAVE BECOME $"; A$
320 PRINT "GAS WILL COST $"; Z$; " PER GALLON."
330 PRINT "YOU WILL BE ABLE TO BUY"; INT(X*10+.5)/10; " GALLONS OF GAS."
340 IF V<0 THEN380
350 IF V=0 THEN PRINT: PRINT "YOUR INVESTMENT WILL NOT HAVE GAINED ANY PURCHASING POWER AT ALL: YOU WILL HAVE JUST BROKEN EVEN!"; GOTO380
360 PRINT: PRINT "THIS MEANS YOU WILL HAVE LOST"; INT(V*10+.5)/10; " PERCENT"; "% OF YOUR PURCHASING POWER!"
    
```

```

370 TR=INT(B*10/T+.5)/10: PRINT "YOU MUST INVEST YOUR MONEY AT"; TR; CHR$(24); "% TO BREAK EVEN."
380 PRINT: PRINT "PLEASE PRESS THE SPACE BAR TO EXAMINE ANOTHER INVESTMENT, OR PRESS THE "; QU$; "ENTER"; QU$; " KEY TO STOP ";
390 GOSUB410: IF I$="" THEN150
400 IF I$=CHR$(13) THEN460 ELSE390
410 PRINT: CHR$(143); CHR$(24); "FOR I=1 TO5: I$=INKEY$: IF I$="" THEN NEXT I: PRINT " "; CHR$(24); "FOR I=1 TO5: I$=INKEY$: IF I$="" THEN NEXT I: GOTO410
420 IF I$="" THEN PRINT I$; CHR$(24); ELSE PRINT " "; CHR$(24);
430 RETURN
440 I=INT(I*100+.5)/100: I$=MID$(STR$(I),2); FOR I=LEN(I$) TO1 STEP-1: IF MID$(I$,I,1)="E" THEN RETURN ELSE IF MID$(I$,I,1)<>". " THEN NEXT I: I$=I$+"." ELSE IF I$>LEN(I$)-2 THEN I$=I$+"0"
450 RETURN
460 PRINT: END
    
```



# SWAT TABLE

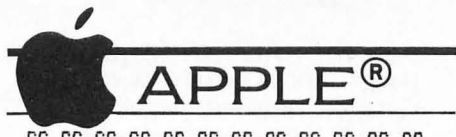
LINES	SWAT CODE	LENGTH
100 - 150	IG	522
160 - 200	XL	517
210 - 320	ID	533
330 - 390	RE	512
400 - 460	CV	279



# IBM® PC

```

SS SS SS SS SS SS SS SS SS SS SS
SS
SS PC Advanced BASIC SS
SS 'Financial Operating System' SS
SS Author: J. M. Keynes SS
SS Translator: Kerry Shetline SS
SS Copyright (c) 1983 SS
SS SoftSide Publications, Inc SS
SS
SS SS SS SS SS SS SS SS SS SS SS
100 S$="###.##": X$="#####.##"
110 WIDTH 40: CLS: UP$=CHR$(30)+SPACE$(39)+STRING$(39,29): PRINT: PRINT: PRINT "Will Rogers once said, 'Our problem is not ignorance - it's all the things we know that ain't so!'"
120 PRINT: PRINT "We all know that a 10-year tax exempt bond yielding 9% is a prudent"; PRINT "investment... or maybe a 20-year treasury bond yielding 11% would be better..."
130 PRINT: PRINT "To examine the results of these or any other investments, press SPACE>"; A$=INPUT$(1)
140 CLS: PRINT: PRINT "This program will allow you to"; PRINT "determine the actual results of your investments in terms of purchasing power."; PRINT: PRINT "For simplicity, we shall assume a"
    
```



```

150 PRINT"gallon of gas now cost $1.00 a
nd will increase in cost at the estima
ted rate of inflation. It is further as
sumed that your yearly dividends, interes
t, etc. are invested at the rate of th
e original investment.":PRINT
160 PRINT"Note: After each entry, you mu
st hit the RETURN key.":PRINT
170 LINE INPUT"Amount of your investment
s: $";I$:A=VAL(I$):IF A<=0 THEN PRINT UP
$;:GOTO 170
180 LINE INPUT"Number of years: ";I$:Y=V
AL(I$):IF Y<=0 THEN PRINT UP$;:GOTO 180
190 LINE INPUT"Yearly return (%): ";I$:R
=VAL(I$):IF R<=0 THEN PRINT UP$;:GOTO 19
0
200 LINE INPUT"Your tax bracket (%): ";I
$:TB=VAL(I$):IF TB<=0 THEN PRINT UP$;:GD
TO 200
210 T=(100-TB)/100:RR=R*T/100+1
220 LINE INPUT"Estimated rate of inflati
on: ";I$:B=VAL(I$):IF B=0 AND LEFT$(I$,1
)<>"0" THEN PRINT UP$;:GOTO 220
230 BB=B/100+1:C=R*T:Z=1:Q=A
240 A=A*RR^Y:Z=Z*BB^Y
250 X=A/Z:W=X/Q:V=(1-W)*100
260 CLS:PRINT:PRINT:PRINT"Today your $";
:PRINT USING X$;Q;:PRINT" investment":PR
INT"buys"INT(Q+.5)"gallons of gas.":PRIN
T
270 PRINT"In"Y"years, your investment wi
ll":PRINT"have become $";:PRINT USING X$
;A
280 PRINT:PRINT"Gas will cost $";:PRINT
USING S$;Z;:PRINT" per gallon."
290 PRINT"You will be able to"INT(X+.5)"
gallons":PRINT"of gas.":PRINT
300 V=INT(V*10+.5)/10:IF V<0 THEN 340
310 IF V=0 THEN PRINT"Your investment wi
ll not have gained you any purchasing pow
er. You will have just broken even.":GOTO
340
320 PRINT"This means that you will have"
:PRINT"lost"STR$(V)%" of your purchasing
":PRINT"power."
330 TR=INT(B/T*10+.5)/10:PRINT"You must
invest your money at":PRINT MID$(STR$(TR
),2)%" to break even."
340 PRINT:PRINT"Please press SPACE to ex
amine another investment or ESC to sto
p";
350 A$=INPUT$(1):IF A$=" " THEN 140 ELSE
IF A$<>CHR$(27) THEN 350

```

```

SS SS SS SS SS SS SS SS SS SS SS SS
SS
SS Applesoft BASIC SS
SS 'Financial Operating System' SS
SS Author: J. M. Keynes SS
SS Translator: Fred Condo SS
SS Copyright (c) 1983 SS
SS SoftSide Publications, Inc SS
SS
SS SS SS SS SS SS SS SS SS SS SS SS
100 DEF FN R2(X) = INT ((X + .
005) * 100) / 100: DEF FN R
1(X) = INT ((X + .05) * 10)
/ 10: DEF FN R0(X) = INT
(X + .5)
110 HOME :Q$ = CHR$(34):KK$ =
"WILL ROGERS ONCE SAID, " +
Q$ + "OUR PROBLEM IS NOT IGN
ORANCE -- IT'S ALL THE THING
S WE KNOW THAT AIN'T SO!" +
Q$: GOSUB 470
120 PRINT :KK$ = "WE ALL KNOW TH
AT A 10-YEAR TAX EXEMPT BOND
YIELDING 9% IS A PRUDENT IN
VESTMENT... OR MAYBE A 20-YE
AR TREASURY BOND YIELDING 11
% WOULD BE BETTER...": GOSUB
470
130 PRINT : PRINT :KK$ = "TO EXA
MINE THE RESULTS OF THESE OR
ANY OTHER INVESTMENT, PRESS
THE SPACE BAR;": GOSUB 470
: POKE - 16368,0
140 GET A$
150 IF A$ < > " " THEN 140
160 HOME :KK$ = "THIS PROGRAM AL
LWS YOU TO DETERMINE THE AC
TUAL RESULTS OF YOUR INVESTM
ENT IN TERMS OF PURCHASING P
OWER.": GOSUB 470: PRINT : PRINT
170 KK$ = "FOR SIMPLICITY, WE SHA
LL ASSUME THAT A GALLON OF G
AS NOW COSTS $1.00 AND WILL
INCREASE IN COST AT THE ESTI
MATED RATE OF INFLATION.": GOSUB
470: PRINT
180 KK$ = "IT IS FURTHER ASSUMED
THAT YOUR YEARLY DIVIDENDS,
INTEREST, ETC. ARE RE-INVEST
ED AT THE RATE OF THE ORIGIN
AL INVESTMENT.": GOSUB 470: PRINT
190 KK$ = "NOTE: AFTER EACH ENTRY
, YOU MUST PRESS THE <RETURN
> KEY.": GOSUB 470
200 PRINT
210 INPUT "AMOUNT OF YOUR INVEST
MENT: $";I$:A = VAL (I$): IF
A < = 0 THEN VTAB PEEK (3
7): CALL - 958: GOTO 210
220 INPUT "NUMBER OF YEARS: ";I$
:Y = VAL (I$): IF Y < = 0 THEN
VTAB PEEK (37): CALL - 95
8: GOTO 220

```

```

230 INPUT "YEARLY RETURN IN (%):
";I$:R = VAL (I$): IF R <
= 0 THEN VTAB PEEK (37): CALL
- 958: GOTO 230
240 INPUT "YOUR TAX BRACKET (%):
";I$:TB = VAL (I$): IF TB <
= 0 THEN VTAB PEEK (37): CALL
- 958: GOTO 240
250 T = (100 - TB) / 100
260 RR = R * T / 100 + 1
270 INPUT "ESTIMATED RATE OF INF
LATION (%): ";I$:B = VAL (I
$): IF B = 0 AND LEFT$(I$,
1) < > "0" THEN VTAB PEEK
(37): CALL - 958: GOTO 270
280 BB = B / 100 + 1
290 Z = 1:Q = A
300 A = A * (RR ^ Y):I = A: GOSUB
600:A$ = I$
310 Z = Z * (BB ^ Y):I = Z: GOSUB
600:Z$ = I$
320 X = A / Z:W = X / Q:V = (1 -
W) * 100
330 HOME : FOR F = 1 TO 1000: NEXT
340 PRINT :KK$ = "TODAY, YOUR $"
+ STR$(Q) + " INVESTMENT
BUYS " + STR$(Q) + " GALLO
NS OF GAS.": GOSUB 470
350 PRINT :KK$ = "IN " + STR$(
Y) + " YEARS, YOUR INVESTMEN
T WILL HAVE BECOME $" + A$: FOR
F = 1 TO 1000: NEXT : GOSUB
470
360 PRINT : FOR F = 1 TO 1500: NEXT
:KK$ = "GAS WILL COST $" + Z
$ + " PER GALLON.": GOSUB 470
370 FOR F = 1 TO 1500: NEXT : PRINT
:KK$ = "YOU WILL BE ABLE TO
BUY " + STR$( FN R0(X)) +
" GALLONS OF GAS.": GOSUB 470
380 IF FN R1(V) < 0 THEN 420
390 IF FN R1(V) = 0 THEN PRINT
:KK$ = "YOUR INVESTMENT WILL
NOT HAVE GAINED YOU ANY PUR
CHASING POWER AT ALL: YOU WI
LL HAVE JUST BROKEN EVEN!": GOSUB
470: GOTO 420
400 FOR F = 1 TO 1500: NEXT : PRINT
:KK$ = "THIS MEANS THAT YOU
WILL HAVE LOST " + STR$( FN
R1(V)) + "% OF YOUR PURCHASI
NG POWER!": GOSUB 470
410 TR = B / T: PRINT :KK$ = "YOU
MUST INVEST YOUR MONEY AT "
+ STR$( FN R1(TR)) + "% T
O BREAK EVEN.": GOSUB 470
420 PRINT : PRINT :KK$ = "PLEASE
PRESS THE SPACE BAR TO EXAM
INE ANOTHER INVESTMENT, OR P
RESS THE <RETURN> KEY TO STO
P;": GOSUB 470
430 GET I$: IF I$ = " " THEN 160
440 IF I$ < > CHR$(13) THEN 4
30
450 PRINT : PRINT : PRINT : PRINT
: END

```



LINES	SWAT CODE	LENGTH
100 - 140	EO	612
150 - 200	FA	553
210 - 310	DP	613
320 - 350	SI	302

**Financial Operating Systems continued**

```

460 STOP
470 PT = 1
480 CH = 0
490 WD$ = ""
500 X$ = MID$(KK$,PT,1):PT = PT
    + 1: IF PT > LEN(KK$) GOTO
    570
510 IF X$ < > " " THEN WD$ = WD
    $ + X$: GOTO 500
520 IF CH + LEN(WD$) = 39 - 1 THEN
    PRINT WD$: GOTO 480
530 WD$ = WD$ + " "
540 CH = CH + LEN(WD$): IF CH >
    39 THEN PRINT :CH = LEN(W
    D$)
550 PRINT WD$:
560 GOTO 490
570 IF CH + LEN(WD$) > 39 THEN
    PRINT
580 PRINT WD$: IF RIGHT$(KK$,
    1) = ";" THEN RETURN
590 PRINT RIGHT$(KK$,1): RETURN

600 I$ = STR$(FN R2(I)): FOR I
    = LEN(I$) TO 1 STEP - 1:
    IF MID$(I$,I,1) = "E" THEN
    RETURN
610 IF MID$(I$,I,1) < > "." THEN
    NEXT I: I$ = I$ + ".00": RETURN

620 IF I > LEN(I$) - 2 THEN I$
    = I$ + "0"
630 RETURN
    
```

```

20 DIM Q$(1),I$(255),Q7$(255),DF$(100)
    ,TF$(100):Q$=CHR$(34):KST=764:KBD=764:
    KLUGE=10000:FM=NO:POKE 710,226
110 ? CHR$(HOME);:? "Will Rogers once
    said, ";Q$;"Our problem isnot ignoranc
    e -- it's all the things we know that
    ";
112 ? " ain't so!";Q$
120 ? :? "We all know that a 10-year,
    tax-exemptbond yielding 9% is a pruden
    t invest- ";
122 ? "ment... but maybe a 20-year tre
    asury bond yielding 11% would be bett
    er..."
130 ? :? "To examine the results of th
    ese or anyother investment, press the
    space bar.";
132 POKE KST,N255
134 IF PEEK(KBD)<>33 THEN 134
140 POKE KST,N255
160 ? CHR$(HOME);"This program allows
    you to determine the actual results o
    f your investment ";
162 ? "in terms of purchasing power.":
    ? :?
170 ? "For simplicity, we'll assume th
    at a gallon of gas now costs $1.00 a
    nd will";
172 ? "increase in cost at the estimat
    ed rateof inflation.":?
180 ? "It is further assumed that your
    yearlydividends, interest, etc. are
    ";
182 ? "re-invested at the rate of the
    original investment.":?
190 ? "NOTE: You must press [RETURN] a
    t the end of each entry."
200 ?
210 ? "Amount of your investment ($)";
    :INPUT I$:GOSUB KLUGE
212 A=VAL(I$):IF A<NO THEN 210
220 ? "Number of years";:INPUT I$:GOSU
    B KLUGE
222 Y=VAL(I$):IF Y<NO THEN 220
230 ? "Yearly return (%)";:INPUT I$:60
    SUB KLUGE
232 R=VAL(I$):IF R<NO THEN 230
240 ? "Your tax bracket (%)";:INPUT I$
    :GOSUB KLUGE
242 TB=VAL(I$):IF TB<NO THEN 240
250 T=(100-TB)/100
260 RR=R*T/100+1
270 ? "Estimated inflation (%)";:INPUT
    I$:IF I$="" THEN 270
272 GOSUB KLUGE:B=VAL(I$)
280 BB=B/100+N1
290 Z=N1:Q=A
300 A=A*(RR^Y)
310 Z=Z*(BB^Y)
320 X=A/Z:W=X/Q:V=(1-W)*100
330 ? CHR$(HOME)
340 ? "Today, your ";:X1=Q:GOSUB FNR2:
    DF=X1:GOSUB USING:? DF$:" investment
    buys ";Q$:" gallons of gas."
350 ? :? "In ";Y$;" years, your investm
    ent":? "will have become ";:X1=A:GOSUB
    FNR2:DF=X1:GOSUB USING:? DF$;" and"
    
```

```

360 ? "gas will cost ";:X1=Z:GOSUB FNR
    2:DF=X1:GOSUB USING:? DF$;" a gallon."
    :?
370 ? "You'll be able to buy ";:X1=X:6
    OSUB FNR0:? X1:? "gallons of gas.":?
380 X1=V:GOSUB FNR1:IF X1<NO THEN 420
390 IF X1=NO THEN ? "Your investment w
    on't have gained you any purchasing po
    wer at all.":GOSUB 420
400 ? :? "This means that you'll have
    lost":? X1:"% of your purchasing power
    !"
410 TR=B/T:? :? "To break even, you mu
    st invest your money at ";:X1=TR:6OS
    UB FNR1:? X1:"%"
420 ? :? :? "Please press the space ba
    r to examine another investment, or pr
    ess [RETURN] to stop:";
430 CLOSE #N1:OPEN #1,4,0,"K":#GET #1,
    Q4:I$=CHR$(Q4):CLOSE #N1
440 IF I$="" THEN 160
450 IF I$<>CHR$(155) THEN 430
9599 POKE 710,148:END
9600 IF NOT DF THEN DF$="0.00":GOTO 9
    604
9602 UA=ABS(DF)+1.0E-03:DF$=STR$(UA):D
    F$=DF$(N1,LEN(DF$)-N1)
9604 TF$="" :IF DF<NO THEN TF$="-"
9606 IF NOT FM THEN TF$(LEN(TF$)+N1)=
    "$":TF$(LEN(TF$)+N1)=DF$:DF$=TF$:RETUR
    N
9608 IF DF=NO THEN TF$=""
9610 TF$(N17)="" :TF$(N2,N3)="" $ :TF$(
    N4)=TF$(N3):TF$(FM-LEN(DF$(N2)))=DF$:D
    F$=TF$:RETURN
9700 X1=INT((X1+5.0E-03)*100)/100:RETU
    RN
9710 X1=INT((X1+0.05)*10)/10:RETURN
9720 X1=INT(X1+0.5):RETURN
10000 IF I$="" THEN I$="0"
10005 Q7$="" :Q9=1:Q5=0
10010 FOR Q7=N1 TO LEN(I$)
10020 Q8=ASC(I$(Q7,Q7))
10030 IF Q8>47 AND Q8<58 THEN Q7$(Q9,Q
    9)=I$(Q7,Q7):Q9=Q9+N1
10035 IF Q8=46 AND Q5=NO THEN Q7$(Q9,Q
    9)=I$(Q7,Q7):Q9=Q9+N1:Q5=N1
10040 NEXT Q7:I$=Q7$
10050 IF I$="" OR I$="." THEN I$="0"
10060 RETURN
    
```



LINES	SWAT CODE	LENGTH
100 - 150	ZT	503
160 - 210	BV	561
220 - 330	ZE	449
340 - 400	LE	569
410 - 520	FV	387
530 - 630	B6	249



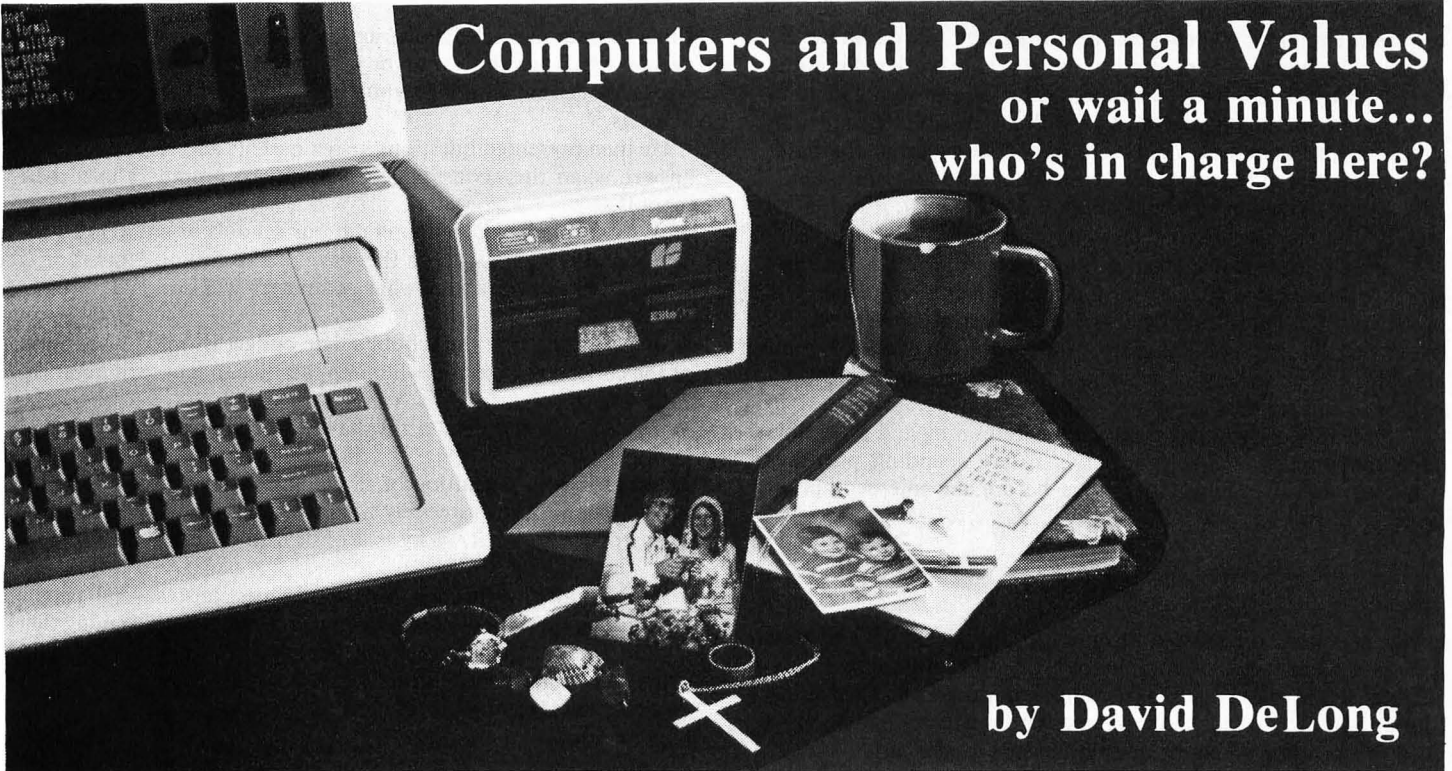
```

SS SS SS SS SS SS SS SS SS SS SS
SS
SS Atari BASIC SS
SS 'Financial Operating System' SS
SS Author: J. M. Keynes SS
SS Translator: Fred Condo SS
SS Copyright (c) 1983 SS
SS SoftSide Publications, Inc SS
SS
SS SS SS SS SS SS SS SS SS SS SS SS
10 NO=0:N1=1:N2=2:N3=3:N7=7:N17=17:N25
5=255:USING=9600:FNR0=9720:FNR1=9710:F
NR2=9700:HOME=125
    
```



LINES	SWAT CODE	LENGTH
10 - 122	DQ	581
130 - 182	OT	566
190 - 260	SF	377
270 - 370	NC	500
380 - 9599	ER	514
9600 - 10010	GM	399
10020 - 10060	JJ	158

# Computers and Personal Values or wait a minute... who's in charge here?



by David DeLong

A new film, promoting a progressive school in New York City, opens with a shot of two students standing at a computer console. One student asks, "How many more Mirages (a French fighter jet) will you need?" Moments later, the film proudly reveals that these eleven-year-olds are engrossed in a computer simulation of the recent Falkland Islands war.

Today, most of us would unthinkingly chalk up this little scene as another victory for computers, education and some creative programmer. But recently, a conference in Harvard, Massachusetts, analyzed that scene from a different perspective. In March, eighteen people, from all over the northeast, took off their computer-colored glasses for a weekend to participate in a workshop titled: "Computers and Personal Values." The rambling white farm house seemed an unlikely place from which to plot a high tech counter-revolution.

The conference title was a contradiction in terms — like mixing heavy metal and smoke. Nevertheless, we felt like pioneers that weekend, as we wrestled with questions just beginning to be defined:

- Does computer technology blind us to the kinds of problems computers can't solve?
- What should computers *not* be used for?
- How can we ensure that our children learn truly valuable things about computers in school?
- What is the impact of computers on our self-esteem and our interpersonal relationships?
- How can we address problems rationally in a society intoxicated with technology?
- What are the unseen limitations and dangers of computer models?

**David DeLong is a business writer and consultant living in Cambridge, Mass. He writes frequently on issues involving the integration of technology into society.**

## Fireside Chats

The group that assembled around the fireplace on Friday night was an interesting mix — an English teacher from the UN School in New York City, a freelance applications programmer, college professors of physics, psychology, and computer science, a systems analyst who had been active in the anti-nuke movements and subsequently had been called on to write software for a nuclear power plant, a consultant specializing in computers and education, and a civilian Navy employee interested in developing Christian video games.

When we introduced ourselves the first night, conference organizer Arthur Fink asked us to do so without mentioning computers and the role they play in our lives. Lesson Number One: Most of us are so comfortable using computer talk as the lubricant in our social interactions that the introductions became halting, nervous speeches as we each searched for words to describe who we really were — not how much RAM we had at home — and how we spent our time when away from computers. This was a valuable exercise because we got to know one another as people, not computer owners.

When Fink let the pent up computerese spill out the next morning, in a second round of introductions, two distinct camps formed. First were those who had spent many years working with mainframe and minicomputers in the business environment. These people didn't need any microcomputer revolution to teach them what a computer can and can't do. But the wisdom generated by experience also carried a burden of preconceptions and, sometimes, strident cynicism. This perspective was characterized by statements like, "BASIC is a language for toy programs," or, "Real database management systems can't run on micros." This *big system* mentality is not technically wrong. It's just a different angle.

In the other camp were the born-again personal computer users, who have just *discovered* micros in the last few years and who are still awed and thrilled by their potential. Our enthusiasm had overwhelmed our naivete. For the first time, the workshop would confront many of us with questions we had overlooked in our euphoria.

## Computers and Personal Values, *continued*

In a case study session Saturday morning, the group reflected on their computer experiences at work, and raised some interesting issues about computers in society. One participant noted the extravagant resources television networks pour into computer systems for predicting elections. "Millions of dollars and hundreds of programming hours are spent developing computer systems all geared to make Dan Rather look good on one night," said a veteran network systems analyst. "Ultimately, it's all done so CBS can command a higher advertising dollar."

Moments later, Bruce Hawkins, a Smith College physics professor, related his difficulty raising money to develop and test prosthetic communication devices for cerebral palsy victims. "If these people can communicate, they can contribute," said Hawkins, "but society is not about to rush in and contribute dollars to this kind of computer research."

The point is, we will pay for certain entertaining and profitable computer applications, but society's future spending priorities will continue to be what they were before the microcomputer burst on the scene.

---

## High Tech Highs

Participants also discussed "technology intoxication" and how it disguises the fact that computers can't do many things. Subconsciously, at least, many of us think computers can "solve the future." In fact, treating computers as "the answer" only complicates a problem when the question hasn't been clearly defined. Too often, we forget that computers can't empathize, understand or be conscious.

An even more difficult question was: What should society use computers for? A consensus developed that computers shouldn't be used where judgment or wisdom is necessary. Enter the gray areas. What about decision support systems for managers? What about airplane navigation systems? Should we use computer-based replacements in the body? What about screening systems in personnel departments? Can computers create art?

One point of this discussion was that whenever we put something on a computer we abdicate some personal responsibility. For example, a personnel manager who hires on instinct, overruling a computer printout which says the applicant lacks the requisite years of experience, may be in trouble if his decision proves wrong. Why? Because the computer "said" otherwise. So, he feels pressure to defer to the computer's recommendation. Then, if things don't turn out, he can always *blame* the computer.

Computers can affect decision-making in another way. QUBE, the interactive TV system in Columbus, Ohio, can poll viewer preferences instantly on any issue, candidate or product. Such interactive systems are sure to become commonplace in the next decade. What will it mean to the quality of our decision making, and the quality of the input we give politicians and marketers? Imagine a nation of people who get most of their information from television, providing influential input on complex issues. Does that possibility scare you? How will interactive mass preference systems affect the quality of decision-making? "Not only will it speed up the process, but it solidifies the tyranny of the majority," said noted MIT computer scientist Joe Weizenbaum, a key figure in the conference.

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## Computers In Education

The most controversial topic of the weekend was computers and education. After several appearances on national television, Weizenbaum has found himself at the center of the controversy building around the rush to bring microcomputers into schools. Saturday morning, the thoughtful computer scientist sat at a small round table in a damp, panelled room in the back of the farm house. He took a sip of water, tucked his long gray hair behind his ears and pulled on a pair of wire-rim glasses. "Help!

I'm a teacher in a school district in Ohio. The district is about to decide what computers to buy, but what we really need are books." Weizenbaum looked up and added, "I get lots of letters like this."

He then presented questions he felt parents and teachers should answer when they consider bringing microcomputers into their schools.

- Why do we want computers in our schools at all? (Don't accept answers such as, "It's the wave of the future." Insist on a substantive answer about what computers will do, said Weizenbaum.)
- Recognizing that the school's time budget is finite, what parts of the curriculum are you willing to sacrifice to have computers in your school?
- Do enough teachers really have the training to teach computing?
- What is your definition of "computer literacy?"
- If we don't know precisely what we are doing with computers, then why rush into it? Why is it critical to do it now?

About halfway through his list of questions, several people couldn't contain themselves any longer. Some began arguing that it didn't necessarily matter whether teachers knew more about computers than their students did. "What's wrong with the kids knowing more than their teachers for a change?" one participant blurted out.

Robin Gustafson, a young programmer from New York City, challenged Weizenbaum's definition of "computer literacy," which, he indicated, had nothing to do with knowing how to program small computers in BASIC. "Computer literacy doesn't mean only writing big programs," she said. "It's like music. You don't have to write a symphony every time you compose something."

Moments later, Princeton, New Jersey consultant Steven Gilbert made a point. "The focus in education currently is on learning about microcomputers, not on learning their uses."

"And that's irresponsible," Weizenbaum shot back, "because we're giving people the idea they actually know something about computers." The MIT professor elaborated, using the analogy of a non-sailor who spends the weekend on a sailboat, and then impresses his landlubber friends with a new rash of sailing jargon.

Weizenbaum's analogy upset me because he had struck home. As someone very comfortable with computer terminology, I can offer all kinds of cocktail-party advice about which system to buy, or how to assess the latest software. But, I'm always a little afraid someone will discover that my computer knowledge — by the standards of "real" computer people — really is superficial.

One reason computer neophytes sound like such experts to their friends is that we have no standard to calibrate one another's level of knowledge. The micro world is too new and too fast-changing to have any standards that really indicate who knows what they are talking about, and who is full of hot air.

---

## Sophomore Literacy

Late Saturday afternoon, as darkness hid the muddy March snow cover outside, a small group worked around a flip chart, brainstorming a new definition for "computer literacy." The question was: What should tenth graders know about computers/computing? Among the group's conclusions — The students should:

- Appreciate that privacy is an issue.
- Continually ask, "What is appropriate computer use?"
- Be intelligent end users.
- Have a healthy respect for the effects of computer misuse.
- Understand information processing functions.

- Have confidence as program users.
- Understand computer systems as models.
- Understand the limitations of models.
- Recognize the costs associated with computing.
- Understand the difference between data and information.

No one had to articulate it. We all knew that *ideal* computer literacy is light years away from the computer education students get today.

Lists like the one above began to give the conference some structure, something many of us had been groping for since we had arrived. This "computer literacy" list led to another confrontation between the computer cynics and the computer idealists that night, around the fireplace. As always, it was a question of experience and perception. Those whose computer experience was limited to micros, and the excitement small computers brought to the classroom, again confronted "experts" with extensive experience on large systems. The advantage of intimidation that a mainframe expert has over most micro users, however, is lost when the criticism ignites an emotional response from small computer users.

## Many Questions, Few Conclusions

Several hours of heated discussion produced few answers, but it helped blunt the sharp edges of the idealistic and cynical perspectives we had brought with us to this rural Massachusetts farmhouse.

On Sunday morning, with the sun glinting off the fast disappearing snow, we settled into the hard wooden chairs for one last time. As a final exercise, we listed the problems, issues and possibilities that the conference had brought into better focus for each of us. The list went on and on, and soon pages from the flip chart covered the back wall of the room.

Here are some of the ideas offered by members of the group:

- Temper enthusiasm about computers with wisdom (and whatever).
- Reconcile the "intoxication issue" vs. a view of the real dangers.
- Sense both dangers and opportunities.
- Retain a hold on human goals.
- Balance computer and other activity.
- Be open about our knowledge — and our ignorance.
- Live a "sober" life, avoiding computer intoxication.
- Ask: what portion of my life does my computer deserve?
- Avoid fleeing to the computer when personal relationships are unsatisfactory.
- Work at reconciling work with computers and self-image.
- Teach that computers are helpful, but not a "quick fix."
- Figure ways to get my kids off the machine, and use the computer for their moral education.
- Recognize that a computer is not a solution looking for a problem.
- Stay aware of data accuracy and reliability.

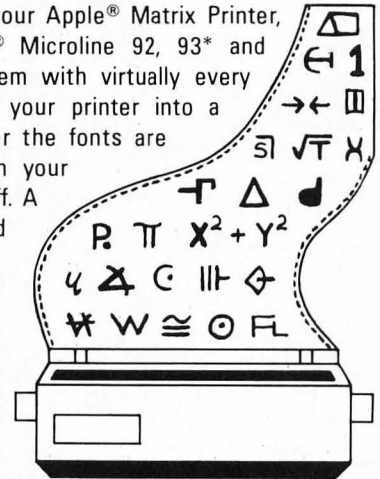
These are a few of the questions and ideas generated in two days of discussions. No one came away with any answers, but everyone left that farmhouse with a clearer sense of the issues confronting us in the microcomputer era. In the next few years, the euphoria created by our love affair with small systems will make it easy to avoid thinking about questions of personal values and their relationship to the microprocessor. It will take no small amount of courage and persistence to address the potential dangers and misconceptions that come with this, and any, revolution. In the end, the winners will be those who can mine this technology for all it's worth without selling their soul for a few chips.

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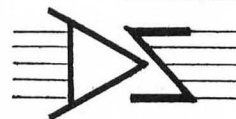
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# POKER SQUARES

This issue's Front Runner is POKER SQUARES, a competitive card game for up to four players. You can play POKER SQUARES as solitaire, too. Each player has an individual time limit, so novices can play right alongside veteran card-players. POKER SQUARES is for the Apple II, II+, and IIe, the Atari 400/800/1200, the TRS-80 Models I and III, and the IBM-PC.

The booklet opposite contains all the instructions, listings, documentation, and SWAT Tables you and your computer will need to enjoy POKER SQUARES. Also available are the SOFTSIDE Disk and Cassette versions (see the bind-in cards and ads elsewhere in this issue for more information).



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**Poker Squares** for the Apple, Atari, IBM PC and TRS-80.  
By Ron O'Laughlin and Bob Whitworth. Translations by the  
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### TRS-80 VERSION

**Micro-Monopoly** ..... Disk Version Bonus  
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**The Memory Game** ..... Program  
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**Solitaire** ..... Program  
By Larry Williams. Translation by Kerry Shetline

### APPLE VERSION

**Apple Blaster** ..... Disk Version Bonus  
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**Moving Marble Maze** ..... Program  
By Mike Rasmussen

### ATARI VERSION

**Five Card Stud Poker** ..... Disk Version Bonus  
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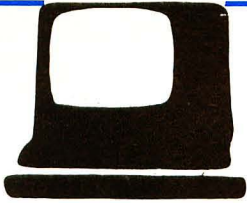
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## TRS-80®SIDE



### Reviews

#### 38 DUNZHIN™

Reviewed by Allen L. Wold  
 Fantastic treasures are yours if you elude the fearsome monsters and diabolical traps populating this dark dingy dungeon.

#### 42 THE ELIMINATOR

Reviewed by Chris Calwell  
 Hostile aliens are about to snatch your primary defenses, your energizers. Can you save them, and thus save your planet from imminent destruction?

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#### 44 THE MAGIC OF INKEY STRING

by Charles M. Morrison  
 This article shows you how to use INKEY\$ to edit keyboard input effectively.



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#### 54 APPLE DISKOURSE, Part 6

by Cary W. Bradley  
 Come along as we explore ASOFTCOMPARE, a debugging utility which finds differences between two versions of the same program.

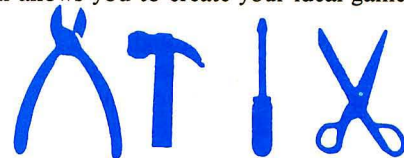
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Reviewed by Fred Condo  
 These two new entries into the market deserve your careful consideration.

#### 60 PINBALL CONSTRUCTION SET

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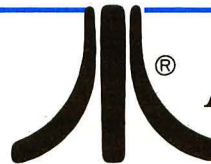
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 Meet Atari's Player/Missile Graphics — the lazy person's way to create complex, animated game graphics.

#### 69 SLIME

Reviewed by Richard E. Herring  
 A slimy goo is raising the level of the earth's oceans, threatening all mankind with a watery grave, and you alone can stop it. Are you up to the challenge?

# DUNZHIN™

Reviewed by Allen L. Wold

## The Scenario

You have just come downstairs to the dungeon's first level. You can see only a few feet ahead of you. As a beginning adventurer you have limited abilities, but you hope to improve them as you explore this place, searching for The Blazing Diamond of Livoc.

As you move slowly through the dungeon, more and more becomes visible. Your map records the corridors and rooms you visit, but if you flee from a monster, it leaves the intervening areas blank. If fog settles in, you must blunder on as best you can. To reach a lower level, you must locate another set of stairs.

Each dungeon level is a maze, randomly created when the game begins. There are from four to seven levels (you never know how many till you get to the bottom), each with fifteen rooms, and lots of twisting corridors in between. Some of the layouts make more sense than others — compatible with a sorcerer's warped mentality.

Some rooms have treasures, others are empty. Some allow you to heal yourself faster than normal, or repair your weapons and armor, or recharge your frustratingly limited magic wand. Your wand has one to three charges, and if you use it in combat, victory is assured. The wand runs out all too soon, however, and you should save it for the real nasties deeper in the dungeon.

by Randall Don Masteller (Intelligent Statements, Inc. (Screenplay), P.O. Box 3558, Chapel Hill, NC 27514). System requirements: 48K TRS-80® Models I and III. Suggested price, disk or tape: \$29.95. Soon available for the Apple®, Atari®, IBM® PC, Commodore 64®, and TRS-80® Color Computer.

## Traps, Treasures and Monsters

There are traps in the corridors, including nets, slippery spots, moving walls, and pits. If you trigger one of these, a flashing symbol appears in the corridor, and a message appears at the bottom of the screen indicating the nature of the trap. If you take the time to read the message, you'll be caught. Keep one finger on the space bar, and hit it as soon as the telltale flasher appears. You might not have time to notice what you missed, but that's better than taking damage.

There are treasures down here: an emerald gem worth 300 gold pieces, a pearl necklace worth 200, a silver medallion worth 100, and many more, as well as the master treasure. This time it is the Diamond of Livoc. Next time it might be the Painful Gem of Winot, or the Evil Torch of Fuduh.

The many monsters prevent you from exploring at leisure, and they get worse the deeper you go. The game counts every move as a turn, and checks for monsters after a certain number of turns. You can move faster than one step at a time, but if you run into a wall too often, you take damage.

Monsters, including ghouls, zombies, harpies, griffons, and three levels of warrior, are not always aggressive, and even if they attack, you may still try to flee or hide. Sometimes, however, combat is the only option. The monsters may appear singly, or in groups of up to four

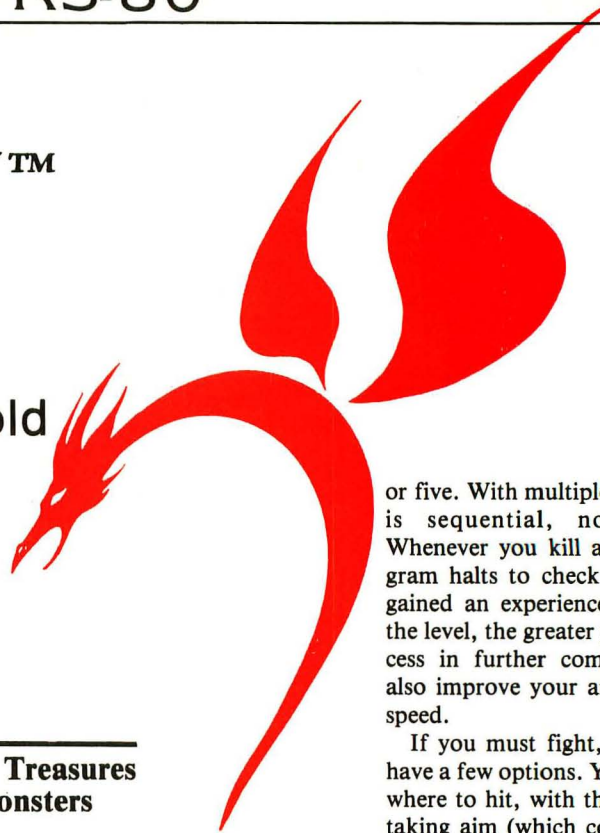
or five. With multiple monsters, combat is sequential, not simultaneous. Whenever you kill a monster, the program halts to check whether you have gained an experience level. The higher the level, the greater your chance of success in further combat. Higher levels also improve your armor, defense, and speed.

If you must fight, or choose to, you have a few options. You have a choice of where to hit, with the further choice of taking aim (which costs you a turn but improves your chance to hit), or using force (which spoils your aim, but may cause more damage if you hit). Some monsters carry small amounts of treasure, but the primary reason for combat is to increase your experience. Accumulated treasure will not do that.

In *Dunzhin*, you have only one choice of role, that of a warrior. While all warriors start with the same characteristics, these decrease as you receive wounds in combat, and increase as you heal or gain experience. If you ask for FACTS, the screen clears and shows your present status. Your character has a level, a count of accumulated experience points, a movement factor, attack, defense, and fight values, and a count of accumulated treasure.

Each part of the body has a certain armor and defense value. The armor absorbs points taken in combat. Any left over points are deducted from your defense value. If your defense level on any body part falls to zero, or if the total accumulated damage reduces your total defense (which is much less than the sum of the parts), you are dead, and automatically given the option to start a new game.

Occasionally, a message appears to distract you from your explorations. A ghostly voice admonishes, "Go Away," and you are teleported to another part of the dungeon. If it happens to be on the same level, you can easily find your way



back to familiar territory. If you are sent to another level altogether, getting out again can be tricky.

As you explore, the map of the dungeon is drawn on the screen. Due to the TRS-80's limited graphics, however, the vertical and horizontal scales are not the same. One step right or left moves the "Y," representing you, one character-space right or left, while one step up or down moves you two full lines, a distortion of about one to four. Monsters are represented by an "X." The bottom lines of the screen are reserved for your commands, combat messages, and for other messages from the program. There are very few verbal descriptions, except when Mad Marvin, the old hermit, throws a brick at you, or when a treasure is found.

This game is addictive, in large part because you learn better ways to play as you go along. Hand-eye coordination is not that important, except when you encounter a trap. Exploration strategy can

make a difference, however. Each monster encountered is vulnerable to a different kind of combat, which you learn by trial and error.

### The Save Feature

The game's most useful feature is the ability to save the game or the character. After the save, you return to *Dunzhin* at the point where you left off. If you save the whole game, and are then killed, you may recall the game at the point at which you saved. This helps you avoid certain traps a second time around. If you save just the character, you may use it in a new game, giving you the advantage of starting a new dungeon with an already advanced warrior. Indeed, the strategic use of the Save feature makes the difference between winning and losing.

When you save, the screen clears and you see a list of five blank entries. You are asked to pick one to contain a message. You then identify the dungeon or character, for future reference. When you choose to play a saved game or character, the list appears, and you choose among those previously saved.

The game comes with a twelve page rule book, which you should read before you begin playing. It gives details on special rooms, traps, movement, mapping, special strategies, and full descriptions of all the monsters you might encounter. (But it doesn't tell you which combat strategies are best for each one!) There is no hint sheet for *Dunzhin*, since it is not a series of puzzles, as are *MicroWorld* or *Asylum*, also from Intelligent Statements, Inc. (Screenplay).

### Sequels

*Dunzhin's* sequels, each more sophisticated than the last, allow you to assume roles other than that of warrior, such as magician, priest, or thief. You can use characters from earlier games in the later ones, allowing you to develop a stable of strong warriors.

Even if you develop a master strategy, enabling you to find the major treasure and clean out all the smaller ones, the frequency of monsters and traps makes this a challenge. Since each dungeon is different, you will not retread old ground. If the game becomes too easy for you, however, *Dunzhin* is only the first part of a series, collectively entitled *Warriors of Ras*. It also includes *Kaiv*, *The Wylds*, and *Pyramid*. Each is more challenging than the one before, with more options and action, and Intelligent Statements, Inc. (Screenplay) promises still more to come.



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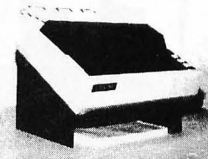


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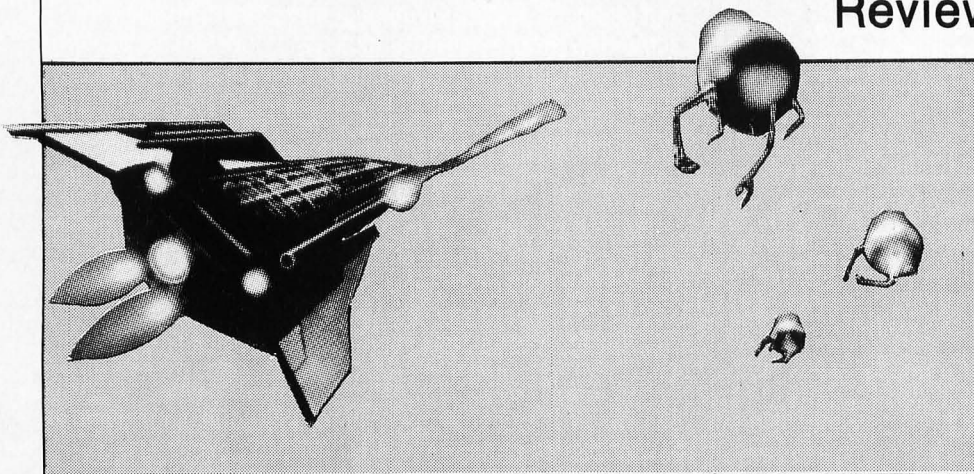
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# The ELIMINATOR

Reviewed by Chris Calwell



As the game opens, your planet is under siege by attacking aliens. Ten energizers, located along the surface of the planet, are your primary means of defense. Waves of hostile aliens soon materialize above the planet and try to steal them. To save your energizers, you must destroy the aliens.

Your main weapons are the "plasma bursts" which shoot out of the front of your ship. Every time you push the spacebar, you release one, and can set up a wall of firepower by moving vertically and pressing the spacebar rapidly. Your only other weapons are the three disruptor charges which blow up all the aliens on the screen. For emergencies, you have hyperspace, which provides temporary escape from the aliens. Pressing ENTER fires a disruptor, pressing CLEAR activates hyperspace, and the arrow keys control movement.

There are many types of aliens and each progressive wave of them is harder to kill. Most numerous are the disruptoids, whose primary objective is to steal your energizers. If a disruptoid successfully takes an energizer to the top of the screen, he mutates and becomes very difficult to kill. If you shoot a disruptoid while he is carrying an energizer, however, the energizer falls away and you earn 250 points. If you catch the energizer and set it down, you earn 1000 points. Then there are the drones. These little devils don't shoot at you, but do

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by Terry Gilman and Wayne Westmoreland (Adventure International, Box 3435, Longwood, FL 32750). **System Requirements:** TRS-80 Model I or III with 16K RAM (cassette); 32K RAM (disk). **Suggested Retail Price:** \$19.95 cassette, \$24.95 disk.

**The Eliminator is a great simulation of the arcade game, Defender...surprisingly realistic and entertaining.**

leave mines in their wake which kill you if you hit them. The meanest aliens are the Tracer Disposal Units, or TDU's. These are normally inactive, but when hit, they release five tracers that track your ship. The tracers must be hit individually. Using a disruptor on a TDU will cause it to split open, but will not kill it. Your best bet is to shoot the TDU with a plasma burst and then use a disruptor.

There are many things to remember in this game. You can accidentally shoot your own energizers, so fire carefully. You must also watch your radar screen, which shows all aliens presently attacking, to catch tracers or mutated disruptoids sneaking up behind you. Disruptor charges should be used sparingly — you only get three per game. Take great care to save the energizers. They earn you extra points after each wave. Once they are gone, the world explodes and you must deal with all mutated disruptoids.

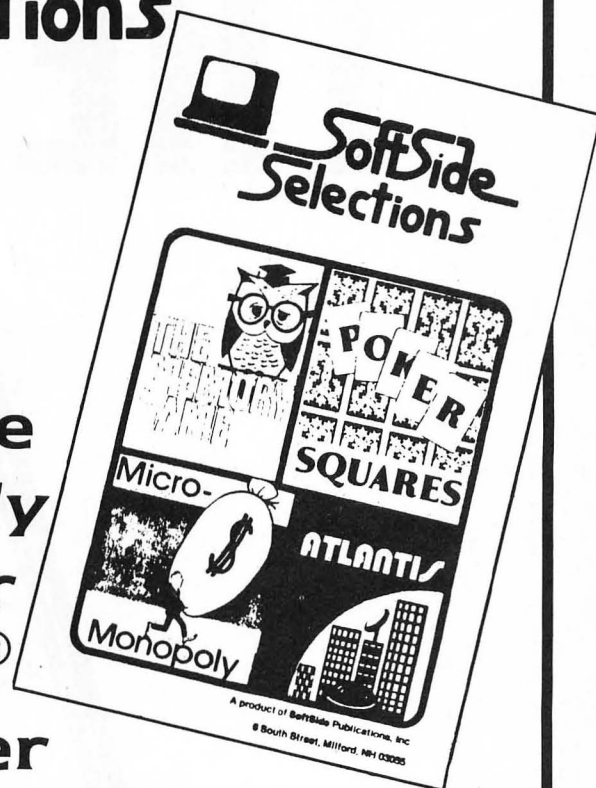
All in all, *The Eliminator* is a great simulation of the arcade game, *Defender*. Although low-res, it is surprisingly realistic and entertaining. The sound effects and keyboard controls are excellent. The game even has a "freeze" mode and game restart option. It plays music for high scores and has an impressive graphic title page.

The only major difference between *The Eliminator* and its arcade counterpart is that, in this game, you cannot earn additional ships as the game progresses. This doesn't detract from the enjoyment of the game, however.

At \$19.95, *The Eliminator* is a great buy. It is attractively packaged and well documented. If Terry Gilman and Wayne Westmoreland's other software is as good as this program, they are destined to be arcade game giants. Don't miss this one!

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# THE MAGIC



“Daddy, it’s all mixed up!” How often we hear that frustrated complaint from a child sitting at a computer practicing an arithmetic problem. The saddest part of all is that the problem usually isn’t caused by lack of arithmetic knowledge — it’s just that children can’t type very well. Their usual peek-and-peck technique leads to many typing mistakes.

Since the objective of learning-programs for children is to teach them the subject, the keyboard should respond only to inputs pertinent to the learning objective. Children should not be penalized because of their inability to type efficiently.

Fortunately, the TRS-80 INKEY\$ function allows us to edit keyboard input effectively. Unfortunately, Radio Shack documentation on the function is rather skimpy, and most BASIC textbooks fail to address the function in detail.

To demonstrate, we will set up a simple arithmetic problem and use the INKEY\$ function to input the answer to the problem. We will take a short section of code, a subroutine in an arithmetic program, and analyze the code in detail, line by line. This way, you will gain insight into this function’s powerful capabilities.

## The Program in Perspective

In the center of the screen we will display a simple arithmetic problem:

$$2 \times 6 =$$

That is all you see on the screen. No question mark appears after the equal sign because we are not using the INPUT function. An advantage of this display is that it is in the exact form a second-grader sees it on work material at school.

The code leading up to this point in the program ends with:

```
PRINT CHR$(23)
PRINT @336,N;"X";NU;"=";
GOSUB 1000
```

GOSUB 1000 branches the program to a subroutine to accept the student’s answer. This subroutine performs two tasks to help: it allows children to erase a legitimate entry they believe is wrong, and it edits keystrokes so only pertinent entries appear in the answer.

During initialization we defined 'C' as a string variable and ANSR as the integer variable for the student’s response. If you decide to use this technique, you can shorten the code somewhat, since I deliberately avoided combining functions to explain and illustrate the INKEY\$ process better.

The first instruction sets the variable CA to a null value. This variable stores the string value of the answer as data is accepted. CB = "" sets the current keystroke value to a null. When a value is entered, this character is added to CA to build the answer string.



# OF INKEY\$

by Charles M. Morrison

## The Heart of INKEY\$

The third instruction scans the keyboard continuously for an entry. The IF statement, testing for a null, keeps the program in a loop until you hit a key. Once you strike any key, but before the entry is displayed, the routine tests the value of the entry using the criteria in the following code of the subroutine.

The next instruction tests for a carriage return, CHR\$(13), as the first entry in the answer. If this is the case, the child has accidentally hit return before entering an answer. The code senses this error and ignores the keystroke by returning to the INKEY\$ function.

The following instruction tests the input for a carriage return after a response has been entered, in this case a legitimate (though not necessarily arithmetically correct) response. You can refine this further by testing for the number of digits in the answer. For example if the answer requires two digits, the program will reject the entry if only one digit is entered. This borders on the grey area of editing for arithmetic correctness, which we avoid in our applications. You can carry it to the extreme, as we tried, and accept only the correct digit. Unfortunately, it doesn't take an eight-year-old long to discover how to hit each digit in turn, knowing only the correct one will appear on the screen.

Backspace, CHR\$(8), permits the child to erase a valid entry to correct a previously entered digit. The first statement works the same as the carriage return entry: if no data is entered, it assumes an error at the keyboard and the routine returns to the INKEY\$ function to get another entry.

The next instruction assumes valid data entry. In this case, the program must delete the previously entered character from the answer string, erase the last entry from the display, and position the cursor at the location of the erased entry. The instruction is partitioned to illustrate each of these functions as they are performed:

- CA = LEFT\$(LEN(CA)-1): reduces the string's length by eliminating the last digit, which is the digit the child wants to erase with the backspace.
- PRINT CHR\$(24);: moves the cursor back one space. The semicolon at the end of the instruction keeps it there.
- PRINT CHR\$(32);: prints a space at this location, overwriting the wrong entry, and the child sees it disappear from the screen.
- We repeat the backspace instruction with another PRINT CHR\$(24);: putting the cursor back in the proper position to accept the next entry. The next valid keystroke entry will appear at the erased position on the screen

The final statement in this line of code returns the routine to the INKEY\$ function ready to look for the next keystroke

action. Needless to say, punctuation is critical in this line of code, to assure correct syntax and also to position the cursor correctly.

IF LEN(CA) = 3 returns to the INKEY\$ function if the child attempts to enter a fourth digit. We do this for two reasons. First, the maximum number of digits in an answer to any problem in this set is three digits and secondly, if a child frequently gets the urge to hit a lot of keys for weird answers, this instruction tends to keep him more devoted to the task.

Since we have tested against all valid entries outside the range of the digits zero to nine, we can set a final test to accept only these digits in the answer — the ASCII values between 48 and 57.

If the test for a digit is not satisfied, the routine does not accept the keystroke and returns to the INKEY\$ point to continue sensing the keyboard. If the entry is a valid integer, the routine accepts the keyboard entry and the character is displayed on the screen at the proper position with the PRINT CB; statement. Also, the accepted entry is added to the answer string with the statement CA = CA + CB, and the routine returns to the INKEY\$ function to scan for the next entry.

This loop continues until a valid carriage return is sensed. At that time the statement at line 1120 converts the built-up input string to an integer value, and returns to the main program with the integer variable ANSR holding the input value.

```

1000 CA = ""
1010 CB = ""
1020 CB = INKEY$:
    IF CB = "" THEN 1020
1030 IF CB = CHR$(13) AND CA = "" THEN 1020
1040 IF CB = CHR$(13) THEN 1120
1050 IF CB = CHR$(8) AND CA = "" THEN 1020
1060 IF CB = CHR$(8) THEN CA = LEFT$(CA, LEN(CA)-1):
    PRINT CHR$(24);:
    PRINT "";:
    PRINT CHR$(24);:
    GOTO 1020
1070 IF LEN(CA) = 3 THEN 1010
1080 IF CB < CHR$(48) OR CB > CHR$(57) THEN 1010
1090 PRINT CB;
1100 CA = CA + CB
1110 GOTO 1010
1120 ANSR = VAL(CA)
1130 RETURN

```

## INKEY\$'s Benefits

What does the routine accomplish? The INKEY\$ function limits acceptable keyboard entries to those pertinent to the

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## The Magic of Inkey\$, continued

learning objective. It allows the child to erase an entry believed to be wrong, and it limits this erase capability to the answer; the student can't erase back into the problem. It allows the child to use the return key to indicate finishing, but provides the means to reject this entry until at least one valid digit is entered. Finally, it limits the keyboard entries to the digits zero through nine only.

Have we solved the "Daddy, it's all mixed up" problem? If we had used the statement "INPUT ANSR" instead of the INKEY\$ routine, the child would have faced some confusing displays.

Inputting a letter or special character brings the cursor down to the start of the next line, prints REDO and positions the cursor at the start of the next line with another question mark. This is confusing and destroys the format of the problem. The arrow keys have similarly disorienting effects. Inadvertent pressing of the CLEAR key (right next to RETURN) wipes out the screen, homes the cursor, and requires reinitialization of the program with a RUN entry. The INKEY\$ function eliminates all these problems.

Another key to consider is BREAK. We do not disable it in any of our applications, preferring instead to teach the children what it does and how to use it. They can still hit it inadvertently, but they recognize the resultant display and will type RUN and ENTER. (They do this deliberately, to take turns when using the programs).

A final key to consider is RESET. If you have a Model I system it is nicely concealed and not subject to inadvertent activation. On the Model III, however, it is on the keyboard, and has a curious orange color. We protect ours with a rigid cover to prevent accidental crashing of the whole program.

## Extending INKEY\$

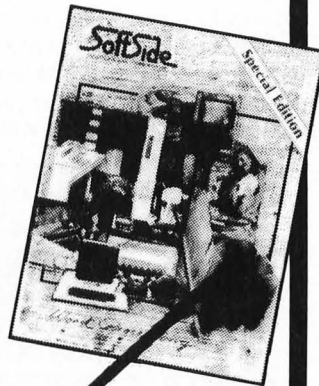
We have discussed the power of INKEY\$ applied to a single simple arithmetic problem. As you use the function, you will see many applications where its unique capabilities permit your program to control the input and data display to provide more useful feedback. For example, you can approach arithmetic problems, where the computations are done by column, using a variation of the routine discussed. You must change it so the data entry is from right to left, under the appropriate columns. Erase must be from left to right, and when deleting an erased entry from the answer string, the deletion must be the left rather than the right digit. The INKEY\$ routine allows us to accomplish all these tasks readily.

You must remember some additional points when using INKEY\$. Null and space values are not the same, and both are valid entries. The two consecutive quote marks indicate a null, and the function interprets this as no keyboard entry. Two quote marks separated by a space indicates space-bar activation, and the function interprets this as an entry of CHR\$(32). Using the wrong one causes undesirable results.

Each execution of INKEY\$ returns a single character string element. These are concatenated for multiple character entries. If you are working with numbers, use the VAL command to convert the final result to an integer value. Finally, bear in mind that INKEY\$ allows you to continue inputting data without using the ENTER key, so your program must control the amount of data it will accept when executing the routine. Our example accomplished this by testing for the length of the answer, rejecting answers with more than three characters.

Using the INKEY\$ function may not prevent every possibility of input error, but it should go a long way toward changing "It's all mixed up, Daddy" to "Daddy, it's magic!"

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# Tales of the Bewildering: Writing Machine Language on the IBM® PC

by Kerry Shetline

As a normal part of my job at *SoftSide*, one of the things I do is program the IBM Personal Computer. Until recently, PC Advanced BASIC has been my sole *modus operandi*. It has its quirks and bugs, but for the most part is a powerful language. I have been able to go further with PC BASIC, without resorting to machine language, than I have on any of the other computers *SoftSide* supports. But, alas, the need for machine language reared its ugly head. One of the projects requiring machine language was IBM *Hopper* (appearing next issue). I needed to create a rather elaborate horizontal scrolling routine for medium resolution graphics, and nothing I could do in BASIC was fast enough for the game to be playable. I had to use machine language.

Enter obstacle number one. The PC's microprocessor is the Intel 8088, and I don't know 8088 machine language. Minor detail — I needed some books about the 8088. I found you do this by purchasing books about the 8086, wherein its little brother the 8088 receives (parenthetical) mention. The two chips differ from a hardware standpoint, but the machine language is the same.

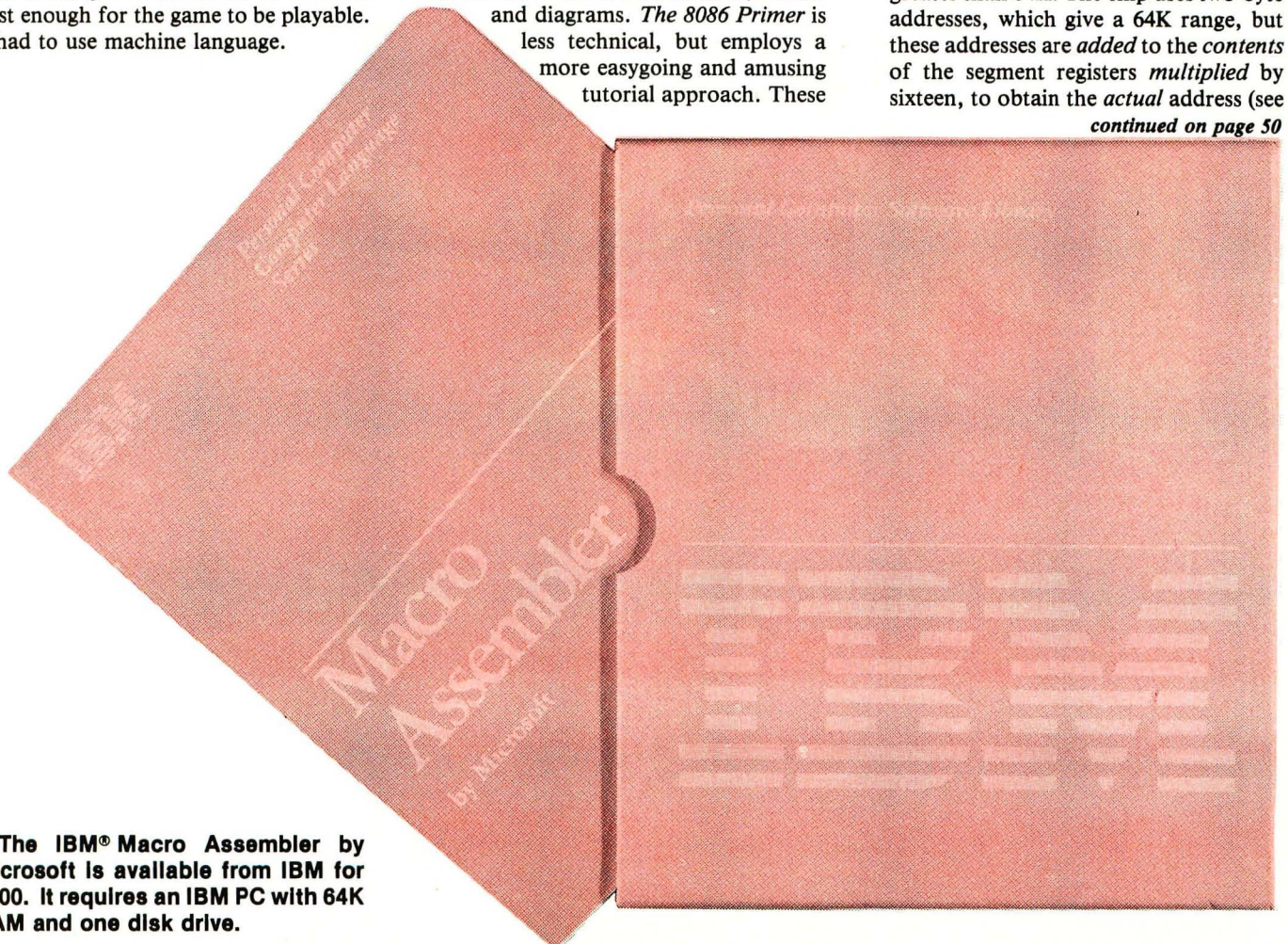
The two books I have are *The 8086 Book: Includes the 8088*, by Russel Rector and George Alexy, and *The 8086 Primer*, by Stephen P. Morse. *The first* is a heavy-handed technical tome, very useful as a reference, with a large section on the instruction set and many charts and diagrams. *The 8086 Primer* is less technical, but employs a more easygoing and amusing tutorial approach. These

are not books to pick up lightly, or to read before bed if you wish to sleep peacefully. The 8086/8088 instruction set is quite extensive, with complex rules about such matters as which addressing modes can be used with which instructions, which types of operands can be used together, and which registers are used for which operations.

## Segment Registers

A property of the 8086/8088 architecture that makes the chip particularly strange to work with is the use of *segment registers*. They enable the 8088 (and the 8086, which I won't mention anymore) to achieve an addressing range greater than 64K. The chip uses two-byte addresses, which give a 64K range, but these addresses are *added* to the *contents* of the segment registers *multiplied* by sixteen, to obtain the *actual* address (see

*continued on page 50*



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Assembler, continued from page 47

Address:	0XXXX
Segment Register:	+ 16(YYYY0)
	-----
Actual Address	ZZZZX

X, Y, and Z represent hexadecimal digits. In case of a result larger than FFFFF, only the five least significant digits represent the address.

table above). The segment registers are also two-bytes, so the total addressing range given by this technique is sixteen times 64K, or one megabyte.

The 8088 has four segment registers:

- The CS (code segment) register (added to the instruction pointer)
- The DS (data segment) register (added to addresses of operands in memory)
- The ES (extended segment) register (added to addresses of operands in memory)
- The SS (stack segment) register (used with stack operations).

Segment registers have some advantages. One benefit is relocatability. You can place most code at any multiple of sixteen bytes from its original location, and then simply load the CS register with the proper value to execute the code. Another advantage is that using two-byte addresses maintains greater compatibility with other chips in the same microprocessor family.

## 8088 Quirks

Of course, the segment register technique presents some difficulties. If you are trying to use more than 64K of memory, you have to worry about making sure that the segment registers are set up properly. This is particularly difficult and time-consuming if you want to use a single block of memory larger than 64K. If you have been wondering why, no matter how much memory you put into your IBM, you can't get more than 64K for BASIC programs, this is the reason. Pointers to program text, variable storage, string space, etc., are only two bytes long so that they may be more easily manipulated, but IBM's BASIC has no provisions to point at different segments.

Since all addresses are relative to a segment register, the idea of "where" becomes a bit foggy. Suppose you are looking at some 8088 code and find a

reference to memory location 304H, for example, where some important piece of information is stored. You still don't know exactly *where* in memory this data is located until you find out *which* segment register will be added to address 304H, and what the *contents* of that register will be when the program is executed.

As a matter of personal preference, I would rather use Motorola's 68010. This microprocessor accesses a sixteen megabyte address range with the straightforward technique of three-byte addresses. Since the 68010 has 32-bit-wide data handling, dealing with the longer addresses is easy.

## Uneditable Assembler

But the IBM has an 8088, not a 68010, so that's what I had to work with. I needed an assembler, so I got IBM's own *Macro Assembler*. This is a rather good assembler, with macro facilities and conditional assembly. However, to a person like myself who has used a number of different 6502 assemblers on the Apple, one aspect was especially disappointing. The assembler is just an assembler, with no editing or debugging facilities. You must create your source file with the EDLIN program on the IBM DOS master, or the word processor of your choice, then feed the source file to the assembler. From this, the assembler creates an object file on disk. Finally, the object file must be linked, using the LINK program on the DOS master. At this point you have a file that can be executed from DOS as a command.

That's fine for creating command files, but I wanted to call the routine from BASIC, and the files created by the LINK program cannot be BLOADED. The method for creating a BLOADable file is described on pages C-5 through C-7 of the BASIC manual. If you read this you will see that writing 8088 code to be used from BASIC was not a major consideration in designing the

assembler. The rather tedious method described for creating BLOADable files would not be too objectionable if it had to be done only once, but how often does code work the first time? Or even the second or third?

## Troubleshooting

As if this laborious development procedure were not enough, the PC's hardware design also works against you. Machine language programs under development crash frequently. If this happens, the only thing you can do is try to recover with a reset. However, the PC often locks up so thoroughly that reset won't work, so you must turn the machine off. Either way, your program is gone, and a post mortem examination of memory is impossible. Since I am a beginner at 8088 programming, these crashes occur frequently. I get rather frustrated when I power back up and the IBM beeps, asking me for the date and time — for the fifth time in an hour.

With all the problems I was having, I had a question or two to ask the people at IBM. I took the same approach with IBM as I have with Apple: just call them up and talk to them. IBM told me to contact my local authorized IBM dealer. Knowing how little most computer dealers know about these aspects of the computers they sell, this did not seem to be a very promising approach. However, I asked my local dealer if I could create BLOADable files directly with the assembler. No one at the store knew the answer, or even understood the question, so they relayed my query to IBM (no, I can't be given that telephone number). The next day I was called and I received information on changing the logged disk drive from A to B. Something got lost in the transmission.

So welcome to machine language programming on the IBM PC. If you have been thinking about getting down to bits and bytes with your IBM, expect some difficulty at first, but don't give up hope. I imagine they will update the *Macro Assembler*. Or perhaps an enterprising software company will fill the need for a better assembler with editing and debugging facilities. Maybe someone will develop a hardware fix for the "killer reset." As for IBM's support of technical users, they need to recognize that they have to assist people who are trying to program their machine if they intend the market to develop software support. 55

# Filemanager +

Reviewed by Steve Birchall

Filemanager +  
Reviewed by Steve Birchall

Most software falls into one of four broad categories: games, spreadsheets, word processors, or databases. Among the latter are many specialized systems for checkbook balancing, record collections, inventories, and invoices. However, a generalized database manager has the advantages of more universal applications, and overall lower cost than a group of dedicated programs. Also, since you need to learn the commands for only one, not several systems, you save time and avoid inconvenience and confusion.

Squarely in the tradition of most database systems for home and business use, *Filemanager+* is easy to use and flexible enough for nearly any application you can imagine. Creating a form involves naming each of the fields or items you wish to track, and defining the characteristics of the entry (number of characters, type of calculation). Entering data is a simple matter of filling out a blank form on the screen. The search functions find the information you need and sort it to your taste. Finally, a report generator prints out presentation quality listings of selected data fields (a specialized report format prints useful items such as mailing labels or disk labels). An important feature is the ability to change the forms after data has been entered, so if you find the forms unsuitable after using them for awhile, you can alter them without having to re-enter everything. A nice tutorial in the manual takes you through the basic steps painlessly.

From Synapse Software, 5327 Jacuzzi Street, Suite 1, Richmond, CA 94804. System Requirements: IBM PC with 64K RAM, IBM DOS, IBM Basic, at least one disk drive. A printer is desirable.

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*Filemanager+* can search on one selected index and up to four subfields. You can re-designate the index and subfields to accommodate changing needs. With all this capability, you should be able to find precisely the information you want, quickly and easily. When creating lists (reports), it will calculate totals for any of the numeric columns. The storage capacity is 1150 records for single sided, or 2300 for double sided drives. *Filemanager+* can index 200 records in one minute under DOS 1.1. →





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# IBM® PC

## Filemanager +

*continued*

The computed fields offer all the capabilities of a four function calculator with a percent key. After you specify all the fields, another menu requests the formula for each computed field; the syntax is similar to VisiCalc® formulae. The results of any calculations appear automatically in the field entry, so you don't have to key them in by hand. A typical business application might be to calculate sales tax in one field, and add it to the selling price to show total price — only the selling price needs to be entered.

In the Retrieve mode, you can ask for all records with a value in a given field greater than, say 25, by entering 25-. For records with a field value less than a particular amount, you might say -300. The same principle works for alphabetical listings: to ask for all records between Miller and Wood, enter Miller-Wood.

Inputting data is simple. You load in an empty form and fill in the blanks, using the return key to advance from one field to the next. When finished, press the End key; the information is saved and a new blank form appears.

Updating is relatively painless. After clearing the screen (F3 key), press End and a prompt appears. At this point you can (U)pdate, (D)elete, or (P)rint the record, or (E)scape to the main menu. With the Autopage on, *Filemanager+* will call up the next record automatically when you finish your update.

List is the option which generates reports. After selecting it from the main menu, a Set Format screen appears. You must fill out the name of each field you want included as a column on the list, which sometimes can be difficult to remember. A more user-friendly approach might ask you to mark them on a blank form. You have an opportunity to specify the line spacing and print size (normal or small) and give the report a title.

### Working Example

Just to explore *Filemanager+*'s functions, I set up a system for keeping track of articles submitted to us at *SoftSide*. All of the pertinent data — author's name and address, article title, type of

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submission (feature, review, program), which computer it's for, and fee to be paid — is on the form. Later, we can search through the files to find all the articles written by a particular author, or all those for the IBM, or all available materials not assigned to a particular issue, and so on. Another report might list everything by each author published during the year, with the fees paid, and a total, so the accounting department could issue an IRS 1099 form. In addition, *Filemanager+* will print out the name and address, formatted for mailing labels.

Criticisms of *Filemanager* are few. Learning it requires a bit of effort, but is not as difficult as learning a new word processor. The tutorial in the manual is well-organized and presents what you need to know without omitting essential steps or bogging down in peripheral details. The reference section at the end gives a concise summary of each program aspect (Create Form, Enter Record, and so on) and the associated commands, along with a summary of all the commands and explanations of the error messages. The only thing missing is a reference card command summary — or still better, a help screen.

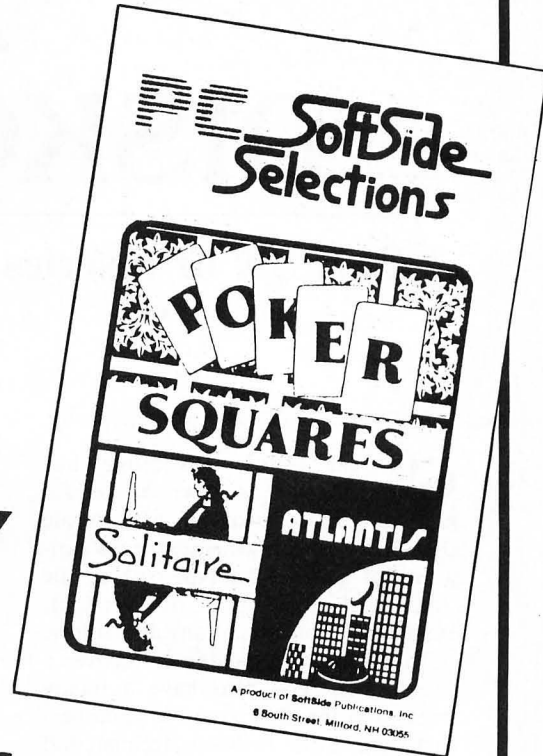
Personally, I prefer the type of database manager which enables me to design my own screen format, rather than making a simple list of fields. Groups of entries seem to belong together, and a long list of fields obscures that kind of visual logic. This may be a personal quirk, and is a minor criticism. I had some difficulty at first when I specified field types, because the manual failed to tell me that the numeric, monetary, and computed fields require no limit on characters — they have defaults.

## Summing Up

*Filemanager+* is a useful piece of software, which is well designed to balance flexibility of application against simplicity of operation. With a small amount of practice, anyone can use it, including those who have just purchased an IBM and don't know anything about computers. Use it for balancing your checkbook and budgeting, organizing a videotape collection, keeping tabs on your progress in a fitness program, or maintaining a mailing list for your church, school or civic organization. The possibilities are limited only by your needs and imagination. 

# SoftSide™ Selections

## The Magazine Especially For Your IBM® PC Computer



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# APPLE DISKOURSE

Part Six of a series by Cary W. Bradley

So far *Apple Diskourse* has developed a number of helpful utilities for working with Apple DOS 3.3. You can generate menus consisting of a particular type of disk file (Applesoft® programs in our version), examine the contents of any disk sector, alphabetize a disk catalog or recover a deleted file. You also have a handy ampersand function to convert numbers back and forth between decimal and hexadecimal.

Aside from each utility's specific function, we intended to provide greater insight into DOS processes. After introducing another utility program in this article, we will put all this knowledge to work writing programs with DOS. Beginning with the next article, *Apple Diskourse* will explore techniques for using DOS from within BASIC programs. The utilities become extremely useful as we proceed, and we will continue to develop more utilities that employ the programming techniques we discuss.

This month's disk utility is based on the last installment of this series, so refer to that article for details about what this program accomplishes.

## Program Comparisons

ASOFTCOMPARE finds all similarities and differences between two Applesoft programs. Like the other *Diskourse* utilities, it accesses the disk by calling the DOS RWTS subroutine directly, rather than through the normal DOS commands.

The utility requires that both programs be on the disk in drive one. The disk containing the programs to compare need not hold ASOFTCOMPARE, as you have the opportunity to switch disks before the comparison begins.

After entering the two program names, it searches the disk catalog to verify the presence of both. The search routine ignores all Applesoft files, and prompts you to re-enter the name(s) if they are missing. The names you previously entered are redisplayed, so that you can retype or modify them. Once located, the track/sector lists of the files are loaded into RAM. They direct the loading of the remaining sectors (up to eleven at a time from each of the two program files), and compare them, byte by byte.

The comparison routine uses what we discovered in our last article about the format of Applesoft programs in RAM. The first two bytes in the program line contain a pointer to the RAM address where the next program line begins. Since Applesoft programs can be relocated in RAM, these two bytes have no meaning unless the program has been loaded by the DOS 'LOAD' command. Hence, this program ignores their values.

The third and fourth bytes of the line hold the line number in hexadecimal, low byte first. ASOFTCOMPARE considers line numbers first, and if they differ, does not compare the remaining lines. If the programs are identical except for line numbers, this utility will not detect that fact.

Following the line number are bytes that represent either tokens for BASIC keywords or ASCII values for non-keyword characters in the line. At the end of each line is one byte containing a zero. The end of a program has three consecutive zero bytes: one for the end of the last line of the program, and two more where the first two bytes of the following line would have been. ASOFTCOMPARE continues until it detects this condition in both programs.

Comparing a line from each program can have one of three results: the lines can be identical; they can have different line numbers; or, they can have the same line number and different contents. ASOFTCOMPARE prints the result of each comparison. When it finds a difference, either in the line's number or contents, you can list the line(s), continue the comparison without listing, or end the program.

Listing a line not a part of the currently LOADED program requires a machine language routine, which is represented by the DATA statements at the end of the program. The routine is a modification of the Applesoft interpreter routine that executes in response to the LIST command. The adventurous among you can examine this routine with the Monitor 'L' command, beginning at \$3000.

Compare the portion beginning at \$3012 to what you will find in BASIC ROM at \$D697. I had to add a few things for this application.

## Memory Allocation

ASOFTCOMPARE runs on an Apple with at least 32K bytes of RAM. Unlike our other utilities, altering this program to use more RAM would be a sizable task. Most of what it does, including the machine language routine, depends upon absolute memory locations. Memory allocation is as follows (addresses are in hexadecimal):

- The machine language routine uses the pages beginning at \$3000 and \$3100. Pages \$3200 and \$3300 store the track/sector lists of the two files being compared. The next two pages, \$3400 and \$3500, are buffers for the program lines to be listed. Addresses \$3600-\$4DFF hold the programs being compared.

- The first program uses \$3700-\$41FF, and the second uses \$4300-\$4DFF (eleven pages each). Eleven sectors of a file's contents can be loaded into each of these areas. When the last program line extends beyond the eleventh sector, the initial bytes of that line are moved to the end of the page immediately before \$3700 or \$4300 (depending upon which file it is). Then it reads more data from the disk. In this way, all the bytes in the line being examined are always in consecutive memory locations.

ASOFTCOMPARE will handle programs up to 122 sectors in length. It has no provision for loading a second track/sector list, which would be necessary if this limit were exceeded. I have no programs longer than this, but

if you do, this utility will not work properly after the limit is exceeded. I can't say exactly what it will do, but I do know that the results will not be correct.

The only drawback to the program is its speed. The large number of IFs and PEEKs in the comparison take considerable time in BASIC. Machine language is better suited to this kind of task, but our goal is to understand what's going on inside the Apple, and BASIC offers the clearest window on this. If you have two versions of a program, but are unsure of the differences between them, this beats examining the listings to find the differences yourself.

## Blind Spots

ASOFTCOMPARE includes little error checking, but if everything is normal, you should encounter no errors. However, certain unusual conditions could produce nonsense from this program. Most obvious is the file size, as mentioned above. Recall that every disk file has a track/sector list divided into groups of 122 sectors. Each group occupies one disk sector. Program sectors are read in eleven at a time so if it does not detect the end-of-program condition within the first eleven groups of eleven sectors, ASOFTCOMPARE will attempt to read more sectors. When it does, it will use meaningless numbers it finds beyond the RAM pages where the t/s lists are stored.

If you have somehow managed to garble the disk's contents (which is a distinct possibility if you haven't been careful in the development of earlier utilities), this program will give misleading or erratic results. ASOFTCOMPARE assumes that both files are intact Applesoft programs, and if one or more sectors have been written over with other data, the program continues to interpret that data as a BASIC program. This condition probably has no remedy, unless you have another copy of the program on another disk.

I have tested ASOFTCOMPARE with a wide variety of sample programs. The only program-related problem which might arise is handling the overflow when a line extends beyond the last sector of a group of eleven. Generating programs with lines ending at a specific position in a disk sector is extremely difficult. I cannot be sure that I tested every possible case, but I am 95 percent certain this program will work for any file. If you encounter a problem you think is due to this factor, please let me know so that we can make the necessary fix.

## Variables:

AD(\*): Memory address where the first byte of a program line is located.  
 BF%: Location that holds the high byte of the address where the RWTS buffer starts. (Note: memory has been allocated so that the low byte of the buffer starting address is always 0.)  
 BH%(\*): High byte of the address where a listed line is stored.  
 BL%(\*): Low byte corresponding to BH%(\*).  
 BS: Buffer starting address, in decimal.  
 CH\$: User input character.  
 DB%: Value poked to BF% to designate a buffer address.  
 EOL%(\*): Tells whether the end of a line has been encountered (0 if no, 1 if yes).  
 F: File number (always 1 or 2).  
 FD%(\*): Tells whether a file has been found in the disk catalog (0 if no, 1 if yes).  
 I, J, K: For-next loop indices (my FORTRAN roots are showing).

L1(\*): Address of upper limit on file buffer.  
 LB(\*): Address of the buffer from which listing is done.  
 LN(\*): Line number of program being examined.  
 MT%: Signifies whether the lines from the two programs match (0 if no, 1 if yes).  
 NB%(\*): Number of bytes in a program line.  
 NS%: Next sector to be read in catalog search.  
 NX%(\*): Counts the track/sector pairs for reading the programs.  
 NS(\*): File name (padded with spaces to 30 characters).  
 RW%: Location to call for RWTS subroutine.  
 SC%: Location where RWTS sector number is poked.  
 ST: Starting address for moving a line in memory.  
 T%: Temporary integer value in data initialization and catalog search.  
 TK%: Location where RWTS track number is poked.  
 TS%(\*, \*): Track and sector numbers where the two files' track/sector lists are found.

```

SS SS SS SS SS SS SS SS SS SS SS
SS
SS Applesoft BASIC SS
SS 'Compare' SS
SS Author: Carey W. Bradley SS
SS Copyright (c) 1983 SS
SS SoftSide Publications, Inc SS
SS
SS SS SS SS SS SS SS SS SS SS SS
    
```

```
10 GOTO 1100
```

Compare the lines from the two programs, byte by byte.

```

100 FOR F = 1 TO 2: IF PEEK (AD
(F)) + PEEK (AD(F) + 1) = 0
THEN LN(F) = 99999: GOTO 12
0
110 LN(F) = PEEK (AD(F) + 2) + 2
56 * PEEK (AD(F) + 3):NB%(F
) = 4
120 NEXT F: IF LN(1) = 99999 AND
LN(2) = 99999 THEN 2100
130 IF LN(1) < LN(2) THEN F = 1:
GOTO 500
140 IF LN(2) < LN(1) THEN F = 2:
GOTO 500
150 EOL%(1) = 0:EOL%(2) = 0:MT% =
1
160 IF EOL%(1) AND EOL%(2) THEN
300
170 IF EOL%(1) THEN F = 2: GOSUB
600: GOTO 300
180 IF EOL%(2) THEN F = 1: GOSUB
600: GOTO 300
190 FOR F = 1 TO 2:NB%(F) = NB%(
F) + 1
200 I = AD(F) + NB%(F)
210 IF I > L1(F) THEN GOSUB 900
: GOTO 200
    
```

```

220 IF PEEK (I) = 0 THEN EOL%(F
) = 1
230 NEXT F
240 IF PEEK (AD(1) + NB%(1)) <
> PEEK (AD(2) + NB%(2)) THEN
MT% = 0
250 IF MT% THEN 160
260 FOR F = 1 TO 2: IF NOT EOL%
(F) THEN GOSUB 600
270 NEXT F
    
```

Print the result for a line number that is common to both programs.

```

300 PRINT LN(1);: HTAB 15
310 IF MT% THEN PRINT "SAME":CH
$ = "C": GOTO 350
320 PRINT "DIFFERENT"
330 GOSUB 1900
340 IF CH$ = "Q" THEN 2100
350 IF CH$ = "C" THEN FOR F = 1
TO 2: GOSUB 700: NEXT F: GOTO
100
    
```

List both versions of a line.

```

400 TEXT : HOME
410 FOR F = 1 TO 2: GOSUB 800: GOSUB
700: NEXT F
420 GOSUB 2000
430 GOTO 560
    
```

Line number exists in only one of the programs.

```

500 PRINT LN(F);: HTAB 15: PRINT
"IN FILE #"F" ONLY"
510 GOSUB 600: GOSUB 1900
520 IF CH$ = "Q" THEN 2100
530 IF CH$ = "C" THEN GOSUB 700
: GOTO 100
540 GOSUB 800: GOSUB 2000
550 GOSUB 700
560 GOSUB 1700
570 GOSUB 1800
580 GOTO 100
    
```

## Apple Diskourse, continued

Subroutine to read remaining bytes in a line.

```
600 IF PEEK (AD(F) + NB%(F)) =
    0 THEN EOL%(F) = 1: RETURN
610 NB%(F) = NB%(F) + 1: IF AD(F)
    + NB%(F) > L1(F) THEN GOSUB
    900
620 GOTO 600
```

Calculate the base address of the next line.

```
700 AD(F) = AD(F) + NB%(F) + 1: IF
    AD(F) < L1(F) - 5 THEN 750
710 IF AD(F) = L1(F) + 1 THEN 730
720 FOR J = AD(F) TO L1(F): POKE
    J - 2816, PEEK (J): NEXT J
730 AD(F) = AD(F) - 2816: GOSUB 9
    50
740 IF PEEK (AD(F)) + PEEK (AD
    (F) + 1) = 0 THEN LN(F) = 99
    999
750 RETURN
```

List a line from one of the programs.

```
800 INVERSE : PRINT N$(F): NORMAL
    : PRINT
810 FOR I = 2 TO NB%(F)
820 POKE LB(F) + I, PEEK (AD(F) + I)
830 NEXT I: POKE LB(F) + I, 0: POKE
    LB(F) + I + 1, 0
840 POKE LB(F), I
850 POKE 12303, BH%(F)
860 CALL 12288
870 PRINT : PRINT : RETURN
```

Move bytes not yet examined and read more data from the disk file.

```
900 ST = L1(F) - 2815 - NB%(F)
910 FOR J = 0 TO NB%(F)
920 POKE ST + J, PEEK (AD(F) + J)
930 NEXT J
940 AD(F) = ST
950 DB% = 43 + 12 * F
960 INVERSE : PRINT "READING DAT
    A FOR FILE #": NORMAL
970 FOR J = 1 TO 11: TA = 12554 +
    F * 256 + NX%(F) * 2
980 IF PEEK (TA) = 0 THEN 1010
990 POKE BF%, DB%: POKE TK%, PEEK
    (TA): POKE SC%, PEEK (TA + 1)
1000 CALL RW%: DB% = DB% + 1: NX%(
    F) = NX%(F) + 1
1010 NEXT J: HTAB 1: CALL -- 868
    : RETURN
```

Initialization, title page and program selection.

```
1100 POKE 235, PEEK (115): POKE
    236, PEEK (116): HIMEM: 1228 7
```

```
1110 DIM AD(2), BH%(2), BL%(2), EOL
    %(2), FD%(2), L1(2), LB(2), LN(2
    ), NB%(2), NX%(2), N$(2), TS%(2, 2)
```

```
1120 RW% = 768: TK% = 781: SC% = 78
    2: BF% = 786: DB% = 50
```

```
1130 L1(1) = 16895: L1(2) = 19967
```

```
1140 BH%(1) = 52: BH%(2) = 53
```

```
1150 FOR F = 1 TO 2: BL%(F) = 0: L
    B(F) = BH%(F) * 256: POKE LB
    (F) + 1, BH%(F): NEXT F
```

```
1160 FOR I = RW% TO RW% + 29: READ
    T%: POKE I, T%: NEXT
```

```
1170 FOR I = 12288 TO 12497: READ
    T%: POKE I, T%: NEXT I
```

```
1200 TEXT : HOME
```

```
1210 PRINT : PRINT " APPLESOFT
    PROGRAM COMPARISON UTILITY"
```

```
1220 PRINT : PRINT TAB( 12)"BY
    CARY W. BRADLEY": VTAB 8
```

```
1230 PRINT "INSERT DISK CONTAINI
    NG BOTH PROGRAMS IN SLOT 6,
    DRIVE 1.": VTAB 12
```

```
1240 PRINT "ENTER PROGRAM NAMES:
    ": VTAB 14
```

```
1250 FOR I = 1 TO 2: PRINT TAB(
    4)"#": I": N$(I): PRINT : NEXT
```

```
1260 FOR I = 1 TO 2: VTAB 12 + 2
    * I: HTAB 7: INPUT "": N$(I)
```

```
1270 IF LEN (N$(I)) > 30 THEN N
    $(I) = LEFT$ (N$(I), 30)
```

```
1280 IF LEN (N$(I)) < 30 THEN FOR
    J = LEN (N$(I)) + 1 TO 30: N
    $(I) = N$(I) + " ": NEXT J
```

```
1290 NEXT I
```

```
1300 PRINT : FLASH : PRINT "SEAR
    CHING FOR FILES": NORMAL : PRINT
```

```
1310 GOSUB 1500
```

```
1320 PRINT : GOSUB 2000: IF FD%(
    1) + FD%(2) < 2 THEN 1200
```

```
1330 FOR F = 1 TO 2: POKE TK%, TS
    %(F, 1): POKE SC%, TS%(F, 2): POKE
    BF%, 49 + F
```

```
1340 CALL RW%: NEXT F
```

```
1350 FOR F = 1 TO 2: NX%(F) = 1: GOSUB
    950: NEXT F
```

```
1360 GOSUB 1700
```

```
1370 VTAB 10: FOR F = 1 TO 2: PRINT
    "FILE #": F": "
```

```
1380 PRINT PEEK (11008 + F * 30
    72) + 256 * PEEK (11009 + F
    * 3072)" BYTES."
```

```
1390 PRINT : PRINT : LN(F) = 0: NEXT F
```

```
1400 GOSUB 2000
```

```
1410 GOSUB 1800
```

```
1420 AD(1) = 14082: AD(2) = 17154
```

```
1430 GOTO 100
```

Search the disk catalog for the files.

```
1500 FOR I = 1 TO 2: FD%(I) = 0: NEXT
```

```
1510 POKE TK%, 17: POKE SC%, 15: POKE
    BF%, DB%: BS = 256 * DB%
```

```
1520 CALL RW%: I = BS + 11
```

```
1530 T% = PEEK (I): IF T% = 0 OR
    T% = 255 THEN 1620
```

```
1540 T% = PEEK (I + 2): IF T% <
    > 2 AND T% < > 130 THEN 16
    20
```

```
1550 FOR F = 1 TO 2: IF FD%(F) THEN
    1610
```

```
1560 J = I + 2: K = 1
```

```
1570 IF MID$ (N$(F), K, 1) < > CHR$
    (PEEK (J + K) - 128) THEN 1
    610
```

```
1580 K = K + 1: IF K < = 30 THEN
    1570
```

```
1590 TS%(F, 1) = PEEK (I): TS%(F, 2
    ) = PEEK (I + 1): FD%(F) = 1
```

```
1600 PRINT "FOUND:": N$(F)
```

```
1610 NEXT F
```

```
1620 I = I + 35: IF I < = BS + 2
    21 THEN 1530
```

```
1630 IF FD%(1) + FD%(2) = 2 THEN
    1650
```

```
1640 NS% = PEEK (BS + 2): IF NS%
    THEN POKE SC%, NS%: GOTO 15
    20
```

```
1650 VTAB 18: HTAB 1: CALL -- 86 8
```

```
1660 VTAB 20 + FD%(1) + FD%(2)
```

```
1670 FOR I = 1 TO 2: IF FD%(I) THEN
    1690
```

```
1680 PRINT "NOT FOUND:": N$(I):
```

```
1690 NEXT : RETURN
```

Subroutines to set up screen titles.

```
1700 TEXT : HOME
```

```
1710 PRINT "COMPARING:"
```

```
1720 FOR F = 1 TO 2: INVERSE
```

```
1730 PRINT "FILE #": F": NORMAL : PRINT
    N$(F): NEXT F
```

```
1740 POKE 34, 4: RETURN
```

```
1800 HOME : PRINT "LINE NUMBER
    STATUS"
```

```
1810 POKE 34, 6: HOME : RETURN
```

Display input options when a difference has been found between the files.

```
1900 PRINT "ENTER: ": INVERSE :
    PRINT "L": NORMAL
```

```
1910 PRINT "I", "": INVERSE : PRINT
    "C": NORMAL
```

```
1920 PRINT "ONTINUE OR "": INVERSE
    : PRINT "Q": NORMAL : PRINT
    "UIT":
```

```

1930 GET CH#
1940 IF CH# = "L" OR CH# = "C" OR
    CH# = "Q" THEN HTAB 1: CALL
    - 868: RETURN
1950 PRINT CHR# (7);: GOTO 1930
Pause for a keypress.
2000 PRINT "PRESS ANY KEY TO CON
    TINUE";: POKE - 16368,0
2010 IF PEEK ( - 16384) < 128 THEN
    2010
2020 HTAB 1: CALL - 868: POKE -
    16368,0: RETURN

```

End routine.

```

2100 POKE 115, PEEK (235): POKE
    116, PEEK (236)
2110 INVERSE : PRINT : PRINT "EN
    D OF COMPARISON": NORMAL : POKE
    34,0: END

```

Data for RWTS subroutine call.

```

2200 DATA 169,3,160,9,32,217,3,9
    6,0,1,96,1,0,0,0,26,3,0,53,0
    ,1,1,255,0,96,1,0,1,239,216

```

Data for the machine language routine to list a single program line.

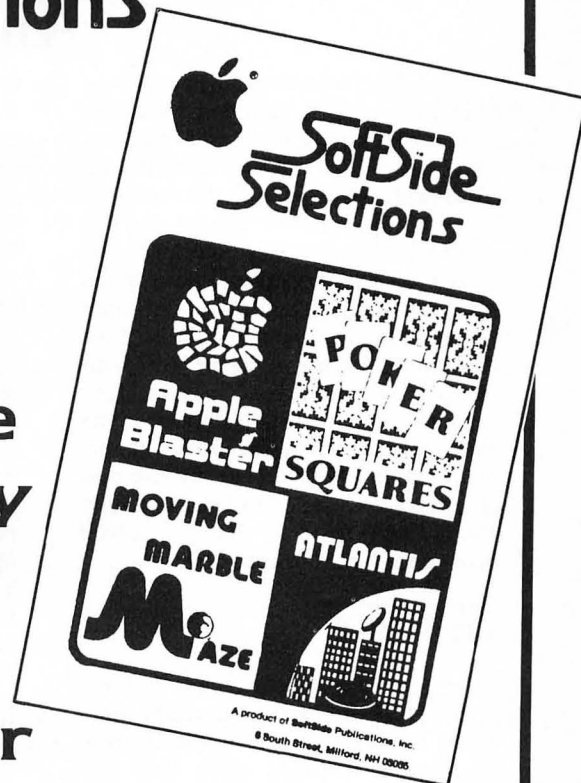
```

2300 DATA 162,0,181,0,157,0,49,2
    32,208,248,169,0,133,103,169
    ,0,133,104,24,165,103
2310 DATA 105,255,133,184,165,10
    4,105,255,133,185,32,12,218,
    32,26,214,32,183,0,165,80
2320 DATA 5,81,208,6,169,255,133
    ,80,133,81,160,1,177,155,240
    ,65,32,251,218,200,177
2330 DATA 155,170,200,177,155,19
    7,81,208,4,228,80,240,2,176,
    45,132,133,32,36,237,169
2340 DATA 32,164,133,41,127,32,9
    2,219,165,36,201,33,144,7,32
    ,251,218,169,5,133,36
2350 DATA 200,177,155,208,49,168
    ,177,155,170,200,177,155,134
    ,155,133,156,208,185,169,13,
    32
2360 DATA 92,219,162,37,181,0,15
    7,0,49,162,0,189,0,49,149,0,
    232,208,248,165,37
2370 DATA 32,34,252,96,200,208,2
    ,230,158,177,157,96,16,184,5
    6,233,127,170,132,133,160
2380 DATA 208,132,157,160,207,13
    2,158,160,255,202,240,7,32,1
    51,48,16,251,48,246,169,32
2390 DATA 32,92,219,32,151,48,48
    ,5,32,92,219,208,246,32,92,2
    19,169,32,76,85,48

```

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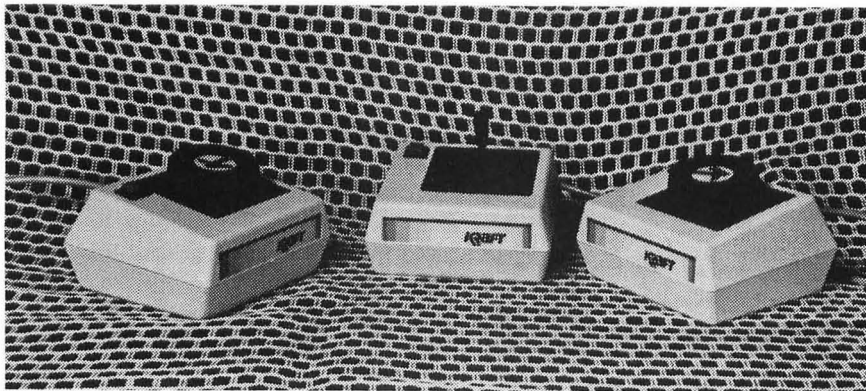
# Kraft Apple-Compatible Joystick And Game Paddles

Reviewed by Fred Condo

Joysticks, trackballs, game paddles — their many shapes, sizes and variations are enough to make your head swim and your knees weak, and their numbers are growing all the time. With the explosion in the home computer market and the phenomenal interest in video games, the market for these peripheral devices has expanded rapidly, and more and more manufacturers have entered the race for the proverbial piece of the pie. Although relatively inexpensive accessories, they can make an important difference in the enjoyment of your system, so it's important to choose wisely. Here are two new products — a joystick and game paddles from Kraft Systems, Inc. — which deserve your careful consideration.

## The Joystick

The Kraft joystick for Apple II computers is a compact, lightweight unit with a sloping top. The Apple IIe version has a modified cable that fits



through the computer's back panel; another version is available for the older members of the Apple II series. Both models plug into the game I/O connector on the Apple motherboard.

The joystick's nicest feature is the ease and convenience of selecting self-centering. Normally, when you play games, it is convenient for the joystick to return to the center position when you release it; however, for applications requiring fine joystick control, like graphics programs, self-centering is a nuisance. The Kraft model permits you

to select the operating mode by flipping two small levers on the bottom of the case. You can even choose centering on only one of the axes. The self-centering mechanism is very sturdy, and you need not worry about damaging the joystick by frequently switching modes. Even if you should wear out the joystick, Kraft offers a one-year warranty.

The buttons are arranged so that you operate one with the left thumb and the other with the left index finger. I find this somewhat awkward, as it forces my hand out of its optimal grasping position. I prefer joysticks I can operate with different parts of my thumb. (This is a personal preference, and you should never buy a joystick without first trying it out.) In any case, the buttons have a firm feel to them, and "bottom out" positively, so you won't gouge holes in your fingers from pressing too hard in the heat of "Extragalactic Warmongers" or "Neptunian Heck Puppies From Space."

Two trimmer adjustment knobs alongside the stick allow you to center the joystick *electronically* after the self-centering springs have centered it *physically*. I would rather have these adjustments on the bottom of the joystick, where they would be harder to move inadvertently.

Like most Apple-compatible joysticks, the Kraft has a thin rod about five centimeters long. You can grasp it easily and comfortably between the thumb and forefinger of your right hand. In both self-centering and free-floating modes, the stick motion is smooth and positive. In testing the joystick with several arcade-style games, its short throw made the rapid responses such games require easy.

Unfortunately, you pay a price for this quick response. The joystick generates its entire range of electronic values over only about one half of the stick's range of physical motion. Moving the joystick from halfway through its physical range to the extreme stop actually does nothing. This makes precise movements somewhat difficult. Slightly less crisp arcade response and more precise positioning for applications like graphics would have been acceptable. This is really a minor point, since most people use joysticks for games, and those with serious graphics applications generally use a graphics tablet or other special hardware.

## Paddles

Kraft also produces game paddles for the Apple II series. Like the joystick, the paddles come in a version for the Apple IIe as well as for older Apple IIs. The paddles' knobs are oversized, which may make them uncomfortable for some people; however, they are ideal for children. Moreover, the travel of the knobs is quite limited, so you can control the paddles easily and precisely. Indeed, in play testing, the paddles proved remarkably smooth and precise in operation, and demonstrated a laudable lack of the jitters.

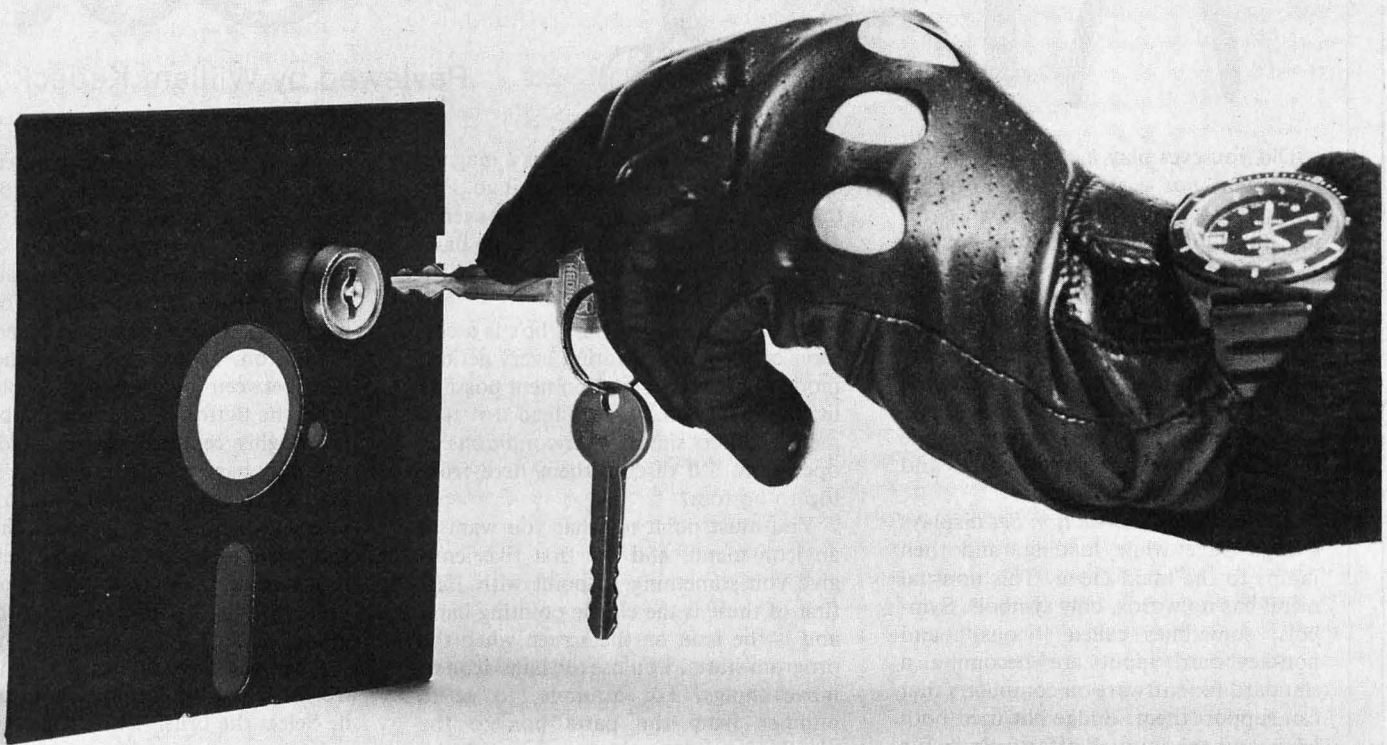
Each paddle's case is identical to the case on the Kraft joystick and comfortably fits most human hands. Whether you like the way it fits *your* hand is a matter of personal preference. The paddles also have the same fine buttons as the joystick but only the thumb-position button is present on each. The paddles' only unmitigated design flaw is that you can't tell which is paddle 0 and which is paddle 1. You will probably want to mark the paddles once you've identified them.

## Summing It Up

The Kraft joystick and game paddles are high-quality input devices for your Apple, and the joystick, in particular, should be an avid game-player's delight. It is not inexpensive, but worth the price because of its sturdy design, easy method for selecting self-centering, and excellent buttons. If you are shopping for a joystick or game paddles, you definitely ought to consider purchasing the Kraft products.

From Kraft Systems Inc., 450 W. California Ave., Vista, CA 92083. Suggested retail price for joystick — \$64.95; for paddles — \$49.95.

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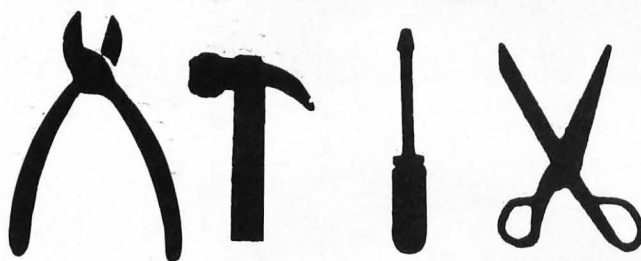
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# Pinball Construction Set




Reviewed by William Kubeck

Did you ever play a computer pinball game and *not* wish for the power to change just one little thing? Well, cheer up. Bill Budge has answered the prayers of anyone who loves video pinball and would write the ultimate game tomorrow if he didn't have to learn 6502 assembler. The *Pinball Construction Set* allows non-programmers to create Machine Language pinball games easily. The only limit to the quality of the resulting game is the care and thoughtfulness of its designer.

The *Pinball Construction Set* displays a logo page while loading, and then jumps to the main menu. This unusual menu has no words, only symbols. Symbols, sometimes called "icons," and non-keyboard input are becoming a standard for software on computers that can support them. Budge has used both icons and the joystick effectively in the often crowded menus of the *Pinball Construction Set*.

## The Pinball Parts Box

In the main menu, slightly more than half the screen is occupied by a blank pinball playfield. Most of the rest is occupied by a menu which the manual calls the "pinball parts box." This is a selection of actual pieces used in a pinball game. There are round and rectangular bumpers, rollovers and targets. There are sets of drop targets (four per set) and

by Bill Budge (BudgeCo, 428 Pala Ave., Piedmont, CA 94611). System requirements: 48K Apple II with one disk drive and joystick. Suggested retail price: \$39.95.

lanes to direct traffic. There is a magnet that grips a ball briefly and lets it go. For the hard-hearted designer, there is even a disintegrator which simply eats the ball.

## Creating The Game

The far side of the parts box is a column of icons representing every action, mode of action, or environment possible in the program. Many lead to sub-menus, others simply alter conditions of operation. I'll discuss them here from top to bottom.

You must point to what you want in an icon menu, and the first five icons give you something to point with. The first of these is the classic pointing hand and is the icon on the screen when the program starts. You use the hand icon to move things. For example, to get a bumper from the parts box to the playfield, point to the bumper with the hand and press the joystick button. A bumper clone separates from the original and follows the hand. Move the hand to position the bumper where you want it on the playfield and press the button again. Presto! A bumper! You may also remove pieces by dragging them off the playfield and dumping them in the parts box.

The next three icons, the "pointer," the "scissors," and the "hammer," are a matched set with related functions. You use them to manipulate polygons, which are shapes, regular or irregular, used to define the shape of the playfield. Polygons are composed of a number of nodes, called "knobs," connected by lines. When you select any of these three icons, all knobs on the playfield light up. To change the shape of a polygon, you

move its knobs with the pointer. Just point to the knob, press the button, and move. If a polygon has the wrong number of knobs to make a desired shape, you can use the hammer and scissors to add or delete a few. To delete a knob, point the scissors at it and press the button. To add one, point the hammer between two existing knobs and press the button. Since new knobs must be roughly centered between old ones, you may have to add and delete several knobs to place a new one close to an old one. The manual states that the program will reject a shape that is degenerate or too complex. I'll take their word for that. Nothing I tried ever upset the program.

Once you have built a shape, use the "brush" and "paint pot" icons to color it. Select the brush icon, point it to the color you want and press the button. Move the brush to the center of your polygon and press the button again. Voila! You have painted a polygon and spilled nary a drop.

Just as a painter has more than one brush, the *Pinball Construction Set* has more than one color-fill mode. To do detail work, select the "magnifier" icon. When you do, the parts box is replaced by an enormously magnified view of a small portion of the playfield. A floating white square on the playfield indicates the location of the magnified view, and you use the brush to move this viewport around. When you point the tip of the brush at the magnified view, pressing the button toggles individual color points on and off. To select a color, dip the brush in one of the paint pots in the icon menu

*continued on page 62*



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## Pinball, continued from page 60

at the bottom of the screen. You may set a black-and-white mode and you may add a cross-hatch grid on the magnified view. That grid can save your sanity when you are working with color artifacting effects that make it nearly impossible to tell where one color point ends and the next starts.

The "play" icon lets you play a limited game to test your creation as it develops. I say limited, because you may put only one ball into play, and when this ball finally hits the bottom of the screen, you must press the button to restart. To play a full game, you must create a finished playfield first.

The "world" icon sets the values for Gravity, Time, Kick and Elasticity. Gravity is just that, the strength of simulated gravity. Time is how fast the ball moves. Kick determines how hard active bumpers whack the ball. Elasticity is the resilience of collisions between passive obstacles and the ball. Each parameter has its own thermometer-like scale, and you use the hand icon to alter the settings.

When you select the "AND gate" icon, everything disappears from the playfield but the pieces. A menu of these to wire up unusual scoring combinations or set conditions for bonuses. The screwdriver connects up to three playfield pieces to the left side of one of the AND gate icons in the parts box.

score, sound and condition selections replaces the parts box. This mode offers three pointer icons. The first is our old friend, the hand. You use this to set single score and sound values. Just point to a piece and push the button. The piece lights up. Now point to a score or sound selection and push the button again. Your selection is now tied to the piece. The other icons, the "pliers" and the "screwdriver," are special. You use

---

*The program is very powerful and flexible and...can produce a darn good pinball game.*

---

You then connect the right side of the gate to a score or bonus. The score or bonus is awarded only when all the conditions on the left side of the gate have been met. If you don't like something you have wired up, use the pliers to cut the connections.

The last action icon is the "disk" icon. Selecting this icon sends you to a sub-menu with more words and fewer pictures than you'll find anywhere else in the program. From this menu, you may load a game datafile, save a game datafile, or create a free-standing game. You may also select which slot (from

four to seven) and drive to access. One of the few real faults in this program is that the selection of slot and drive returns to the defaults after each access. This can be very annoying if you are cautious and save your work frequently.

Game datafiles are quite small. The ones I made varied from four to six disk sectors in length, and the four demo games on the program disk are as long as nine sectors. Free-standing games are another story. These are 121 sectors long, so very few fit on one disk. The games, however, are truly independent. They can be placed on any normal disk and simply BRUN. Finished games do not require the *Pinball Construction Set* to run.

## Summary

I give the *Pinball Construction Set* a very high rating. Other than the annoying operation of slot/drive selection in the disk menu (mentioned above), my only other criticism is the manual. The manual is short (twelve half-size pages) and simplistic. It gives a basic explanation of each function, but offers no advice on application. I felt like someone had taught me all the moves of chess without teaching me strategy. This avoids frightening the first-time user, but the program would be more valuable if Mr. Budge had shared some of his considerable expertise on pinball game design. It is hard to design a good pinball game, and a guiding hand from an expert could save much frustration. Also, much of what might have been learned from the four demo programs on the disk is lost because there is no explanation of *why* the creator did what he did.

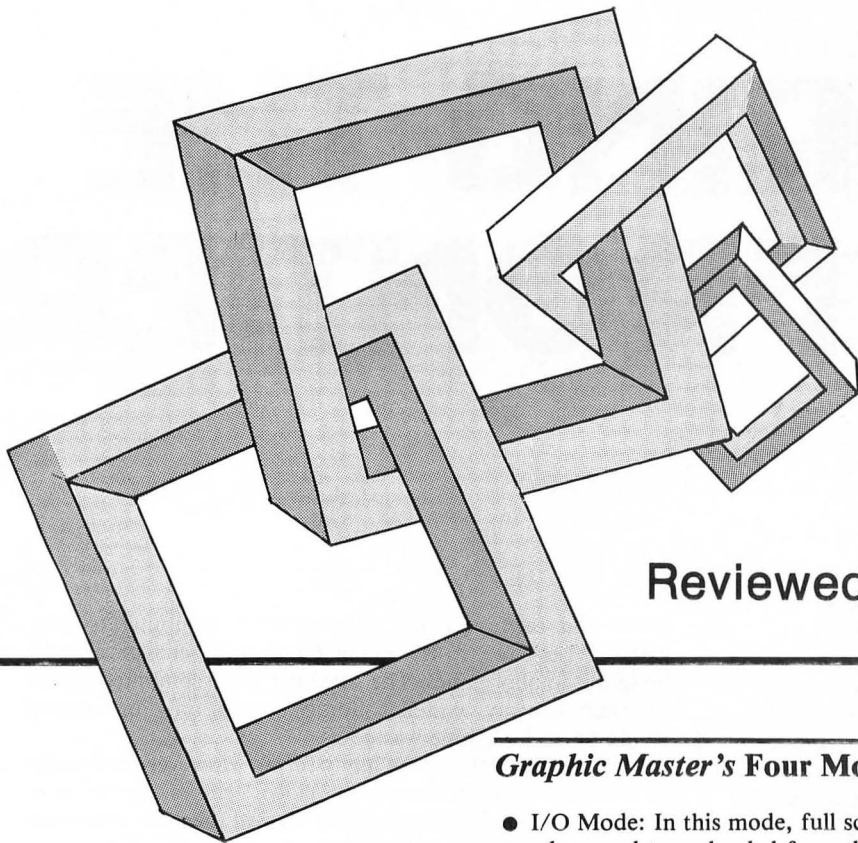
On the plus side, the program is easy to use and hard to foul up. The icon menu system is extremely effective. I was so used to doing everything with the joystick, that I was briefly disoriented when I had to type in a file name from the keyboard. The program is very powerful and flexible and, subject to the limitations of the user, can produce a darn good pinball game. Its only visible lack is the absence of flashy support graphics. If you compare the *Pinball Construction Set* playfield to that of a commercial game like *Raster Blaster*, you will note the absence of a logo banner and the bonus multiplier display. This, however, is a very small price to pay for the ability to build the game just the way you like it. The *Pinball Construction Set* is a good program and well worth the money.

## SoftTakes



# GRAPHIC MASTER

Reviewed by Richard E. Herring



**H**ave you ever wanted to edit graphics on your computer as easily as your word processor alters text? Perhaps you'd like to decorate your correspondence, create business charts and graphs, or lay out a floor plan for your new office space or dream house? If you answered yes to any of the above, read on.

*Graphic Master* turns your Atari into a machine capable of creating and displaying graphic designs. The program allows you to toggle between two independent high resolution screens (equivalent to GRAPHICS 8 Mode). Multiple colors are allowed through artifacting. As you move any piece of your creation around, the program preserves the original colors.

from Datasoft, Inc., 19519 Business Center Dr., Northridge, CA 91324. System requirements: Atari 400/800/1200 with 40K RAM, BASIC cartridge, disk drive, joystick and printer (optional). Suggested retail price: \$39.95.


## *Graphic Master's Four Modes*

- I/O Mode: In this mode, full screens may be saved to or loaded from disk in 62 sector files. You also access the disk directory in this mode.
- DRAW Mode: This mode allows you to draw using the joystick. In this mode, three special functions are available — line, circle, and polygon. "Line" allows you to draw a solid or broken line between any two points. "Circle" produces small to medium sized circles, entered at the current cursor position. "Polygon" draws closed figures with as many as nine equal sides. Again, you control the size.
- TEXT Mode: This mode lets you type letters, numbers, and special graphic characters on the screen. Before entering this mode, you choose a text size. To change to a different text size, you must exit and reenter TEXT Mode. You can easily load special character fonts created by another program.
- EDIT Mode: This is, by far, the most important mode. It is here that I do most of my work. First, select a window size from eight to eighty pixels square. Then pick up any image which appears in the window and place it anywhere on the screen, or toggle to the other screen and place it there. Several particularly useful screens of images are provided with the program — chemical symbols, electronic symbols, and a palette of textured colors. Once you pick up an image, you can

lay it under or over other images. For instance, you could fill large text with colors or intricate patterns.

Additionally, you can rotate any image in 90 degree increments, and increase or decrease its size. You can roll the image up, down, left, or right, one pixel at a time, or make a mirror image of the contents of the window. Edit mode's best feature is its ability to skew the contents of the window, or of the entire screen. You can slant the image to the left or right in large or small steps. This is great for designing titles or logos. When your design is complete, you can overlay one entire screen on another.

Finally, *Graphic Master* lets you print a copy of your design on an Epson (with Graftrax) or NEC 8023-A printer. Unfortunately, it prints the image sideways and reduced to three inches high and four and one-quarter inches wide. In order to get full size screen dumps, you need a different program. (*Color Print*, also from Datasoft, dumps the screen in four colors using colored carbons and multiple passes.) A utility is included which allows you to save high resolution screens from other programs.

The 22 page manual recommends several possible uses for *Graphic Master*, from logic design to computer art. This program hardly makes your Atari a dedicated graphics computer, but it is extremely useful for enhancing reports and for limited design work. 

# EXPLORING THE ATARI® FRONTIER

by Alan J. Zett

## The Player/Missile Connection: Part I

When people talk about graphics on an Atari personal computer system, they often fail to realize just how versatile and complicated the Atari really is. Many different types of graphics systems are available for microcomputers — new systems are designed literally every day. The folks at Atari realized that, for a computer to stay in the marketplace in these ultracompetitive times, they would have to put a lot of extra thought into its design to assure it a place in the future. This month, we depart from our normal format to bring you a computer/graphics overview which also serves to introduce the next multi-part Frontier series on Atari Player/Missile Graphics (PMGs). After all the letters were polled, PMGs won out as the most requested subject. Since the scope of PMGs is so wide, *SoftSide* will devote the next several months to this multi-faceted subject. But for now, sit back and relax while we explore an entirely new Atari frontier.

## A Computer Graphics Introduction

Computers are one of humanity's greatest blessings and curses. Applications range from helping man solve the deepest mysteries of life, to helping the unscrupulous destroy everything man has worked for. Luckily, we as personal computer owners need not concern ourselves with such weighty matters.

You can find many practical reasons for owning a home computer. Almost everyone who owns one has thought about the ability of computers to play games. Believe it or not, I classify recreation as a practical reason for buying a computer. A few years ago, the idea of using a computer for playing games was something to be ashamed of. A common rationalization was, "I use it for word processing, personal finance, education, and so on. Oh, and it plays games too." People seemed to add the last part, almost as an afterthought — just another useless feature — when in truth games were the *real* reason for buying the computer. Now, in these enlightened times, when addiction to computer games is considered just another psychological disorder, you can come out of the

closet and confess, "Yes! I bought my computer to play games!" Let's face it. If you bought an Atari, chances are you bought it to play games. The Atari *is* a game computer. It was designed that way. To sell it short by using it only for business would be an incredible waste.

Computer games assume many forms. However, in this age of arcade mania, animated or "Video" games are the most popular, even on home computers. One of the most important requirements of an animated game on a computer is a sophisticated graphics system. You can have the most interesting game concept in the world, but if you can't captivate your audience with dazzling graphics they will find it hard to "escape" the real world to have fun in the imaginary one.

The Atari has a sophisticated graphics system. It manages to be limitless by virtue of its complexity. Most computers have only two kinds of graphics: character (text) and plot (pixel). These alone can be sufficient for any game application, if they are of high enough quality. Many criteria arise for any particular kind of graphics. With character graphics you need to know the resolution (how many characters can fit on the screen). The "standard" in the world of mainframe computers is 80 × 24 characters on a screen. Differences in the quality of viewing devices (terminals on mainframes and TV sets on home computers) require some tradeoffs.

Another question which pops up is: Can you redefine or redesign the character set? The popular arcade game, Pac-Man® is done entirely with redefined character graphics. Another important question (especially in an arcade game) is color. Can characters be displayed in any color? How about multi-colors? Even a simple text game can be made more interesting, if not addicting, by liberal use of color. For example, in an all text version of a Star Trek game, warning messages could appear in color (i.e. "Condition Red" in red, "Condition Green" in green). You could construct multi-colored graphic shapes by combining ASCII characters, each of a different color. The list goes on and on.

What about plot graphics? The two most important considerations in this category are: How many colors can I display, and, what is the highest resolution mode? Naturally, the more colors the better. Resolution is extremely important for realism. If you have a high enough resolution, you can't

distinguish reality from animation. A computer with ultradensity color graphics can display photographs on a monitor screen. Some scientists use computers to correct, sharpen, and even modify photographs. All the Viking pictures from Mars and Voyager's shots from Jupiter and Saturn required extensive computer enhancement.

On the other hand, not all applications require such high resolution. A simple game of pong requires little more than character graphics on some systems. Though programmers have long dreamed of a system with ultrahigh resolution and limitless color graphics, reality limits the practical implementation of those dreams. In this case reality is a synonym for money. Such a system would cost enough to cause most large companies to cringe. In the home computer market, money is a hard reality.

Another question is: Can I mix character and plot graphics? If you have high enough resolution, this question is irrelevant because plot graphics can construct characters. But for home computers, plotting is too slow for good games.

So where can you find a computer with the best selection for a reasonable amount of money? Atari has approached the problem of computer graphics in a unique and powerful way. In a world where technology improves on a daily basis, and more sophisticated computer equipment costs less and less to produce, Atari has taken the approach of versatility. By providing enough kinds of graphics subsystems all tied together in one large graphics package, Atari gives you the ability to combine the individual types to produce a nearly infinite number of game designs. The maximum number of permutations possible is only as finite as the programmer's mind. Leaving these aspects of computers and computer graphics behind, we'll take a look now at the realities of Atari programming.

## A Player/Missile Preface

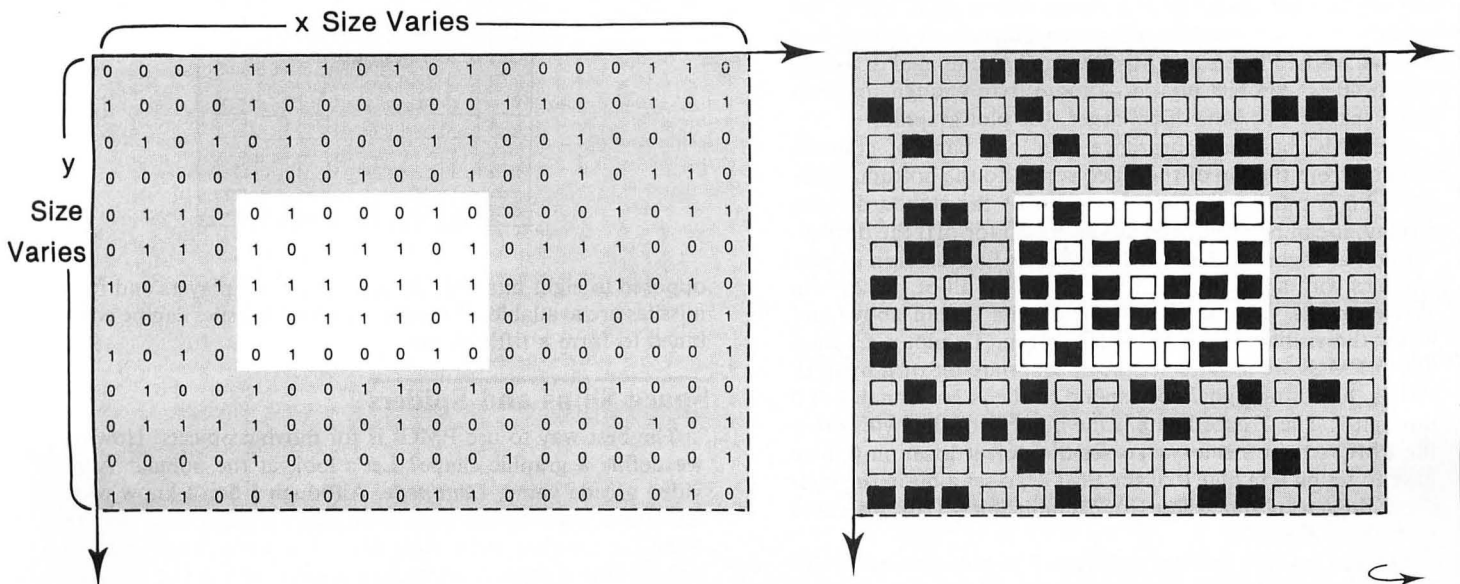
The Atari has character graphics, plot graphics, and a new kind of system known as Player/Missile Graphics.

Character graphics are, in a sense, interpreted. The computer looks at a byte of screen memory and says to the video processing hardware, "Tell the user what this means by displaying a complicated macro symbol or shape he understands." In some systems this shape is predefined as an ASCII character. The Atari's ability to redefine these shapes provides extra versatility. The plot graphics take the same byte of screen memory and say, "Turn this into a set of dots on the screen to make part of a complicated shape." The main difference between character and plot graphics is that character graphics represent some known concept (such as a letter), whereas plot graphics construct a new or complicated concept (such as a ship in an arcade game).

To accommodate the numerous uses of plot graphics, Atari gives you several preselected resolutions and colors. But even all of this is not "set in stone." Display Lists, Display List Interrupts, and Vertical Blank Interrupts also allow unlimited custom graphics displays. Special combinations of modes, and the ability to modify existing ones, let you create entirely new modes.

The concept of PMGs is radically different from other graphics systems. With plot graphics, shapes are constructed from separate bytes of information. This information is totally dependent on the computer and the graphics mode used. But screen memory is not two-dimensional, even though it appears that way on the screen. A screen location one position below another actually is several bytes further down in consecutive one-dimensional screen memory. To explain this, look at Figure 1. For now we'll say that the shape's first byte occurs at screen memory location 0 in a GRAPHICS 0 mode. The second line of the shape starts on the next line immediately below the first — or so it appears. In memory, the second line of the screen starts immediately following the first line. Since the first line is 40 bytes long (GRAPHICS 0 is a 40 × 24 text mode), the second line will start at byte 40 in memory (assuming the screen's first byte is numbered 0.)

Figure 1. SCREEN RAM: A Sea of Bytes



## BASIC Limitations

BASIC does all of this calculating for the programmer, but BASIC is not always the best language. In an arcade game, hundreds of calculations need to be done in half a second, so you must use Machine Language because BASIC is too slow. But if you program in Machine Language, you lose all of the benefits of the BASIC interpreter. You must do all of the calculating yourself. If you wanted to move the shape shown in Figure 1, you would have to calculate where, in screen memory, the bytes should go to appear that they move together. These calculations take time, and anything that takes noticeable time, even in Machine Language, can lead to extreme programming difficulties. Imagine trying to do all of this from BASIC.

PMGs solve this problem by taking a new approach to displaying shapes on a video display. A PMG shape actually is not a part of screen memory. It only appears so on the screen. A PMG really is superimposed on the video screen's representation of screen memory. (For the sake of clarity: the video display is the actual image on the TV screen, and the video screen is the TV screen or monitor. For more information on video displays, screen memory, and how the Atari hardware works, see the first Frontier article in the May, 1982, issue of *SoftSide*.) If you can imagine, a PMG is an entire miniature video display of its own. It has its own screen RAM, and its own video processor. The reason it is so useful is that the width of a PMG screen line is exactly *one* byte.

Taking this analogy of a PMG and a video display one step further, in general a PMG consists of a screen with the dimensions of one by 256. (Many options can act upon a PMG to change its physical content and appearance, so for now we'll discuss a PMG in this, one of its most common forms.)

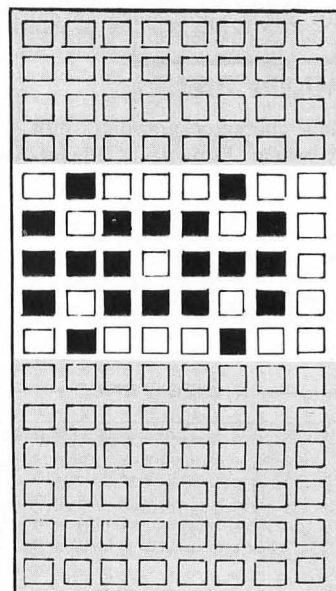
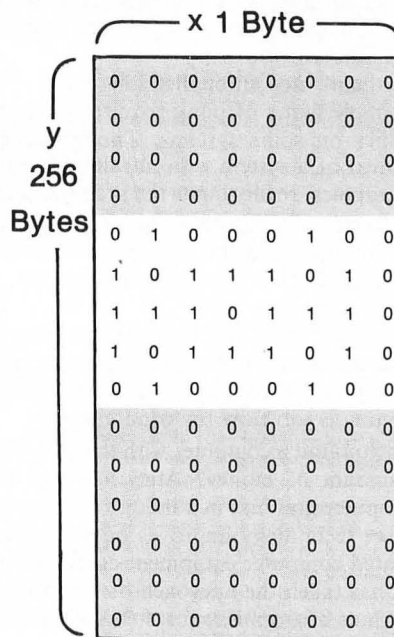
How can anything with a resolution of one byte be useful? The answer lies in the fact that a PMG functions like a character graphic. It consists of bytes bit-mapped to display a certain pattern. Each of the bits in a byte determines how a specified portion of the PMG will look. In this sense, one of the simplest forms of a PMG consists of a video display with a resolution of eight by 256 bits of information. We are not using the PMG to display a screen of information; we are using it to display a shape. In light of this fact, eight bits is enough in most cases. In a situation where eight bits is not enough, you can combine on-screen players. In an extreme case, all of the Players and Missiles can be combined to form a screen  $40 \times 256$  bits in size — more than enough for most game shapes. For something larger, use plot graphics.

The PMG has the appearance of a long band of graphics running from the top of the video screen to the bottom. Since its width is much less than the width of the standard video display, it can be positioned anywhere on (or off) the display.

Look at Figure 2. The PMG display is like a screen of plot graphics with a resolution of  $8 \times 256$ . Not all of the 256 are visible on the video screen. A lot of bits extend above and below the visible area of the video screen. To plot a graphics dot in PMGs we have to set the appropriate bit of a byte. In PMGs, bits 0 through 7 correspond to the X coordinates of 0 through 7. The Y coordinate is the number of the byte within the PMG screen memory. To set the dot at location 0,0 we have to set bit 0 in byte 0 of the PMG. To set a bit in the middle of the screen somewhere (for example: bit 4,120), we would set bit 4 of byte 120.

Missiles are very similar to players. The only noticeable difference between them is that missiles are only two bits wide, as

Figure 2. PMG RAM A Column of Bytes



opposed to eight bits wide for a player. Four players and four missiles are available. If needed, the four missiles can be combined to form a fifth player.

## Space Ships and Spiders

The best way to use PMGs is for moving objects. How do we define a graphic shape? Let's look at the popular Atari video arcade game, *Centipede*. Although I don't know what techniques actually are used to display the graphics, I can use PMGs to simulate them on an Atari. I do know from a reliable source, that *Centipede* contains advanced versions of ANTIC, POKEY, and GTIA, as well as several microprocessors. I'm

sure it has some circuits most Atari programmers would give anything to have in their home computers. But remember that an Atari 800 costs much less than a *Centipede* game.

Virtually hundreds of ways exist to simulate an arcade game. My suggestions are only one method of accomplishing the desired result. My idea of a computer version of *Centipede* probably would use a redefined character set for the centipedes while PMGs would handle the spiders, scorpions, fleas, and the player's ship.

For example, the flea has a shape that only moves down the screen. If you define a PMG and position it at the appropriate horizontal position on the screen, you simply shift the PMG screen one byte at a time to move it down its little eight-bit-wide screen. The player's ship also moves within a limited area. The reason for using a PMG shape here, instead of plot graphics, is that PMGs free up computer time normally used in calculating how and where to move the shape, and they *simplify programming*. For something that never moves, such as a mushroom, plot graphics are more practical because once plotted, they stay put until they need to be removed (when they are shot). Plotting is not what takes time — but the successive recalculations required to replot the shape do.

The spiders represent another use of PMGs. Not only do the spiders move around the screen, but they are also animated. PMGs are especially useful in animation. To change the bytes in a PMG's tiny screen area to another shape in the animation sequence is simple. As it moves, the spider's legs twitch. All we need do is change the bytes associated with the legs.

Other approaches to animation are possible. Because PMGs can be positioned so fast, one PMG can be used on different parts of the screen at the same time — or so it seems to the eye.

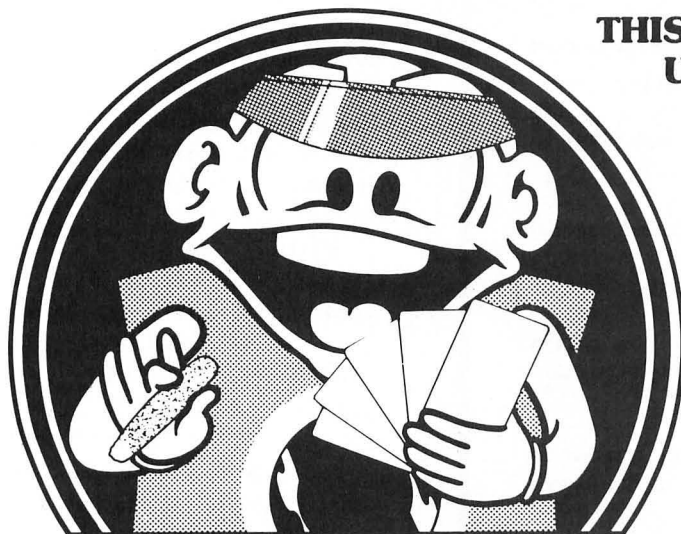
With enough work, you could design an entire game using only one PMG for all of the graphics. Having more than one available only makes game design less of a task to the programmer.

Because the PMG has so many options, special effects are easy to program. PMGs can be any one of three widths, and one of two thicknesses. They can become any color, totally *independent* of the rest of the video display. The list goes on and on.

Even Atari uses a PMG in a unique way in one of their video cartridge games. The analogy of a PMG as a separate video screen is close to the truth. TV sets have timing signals — horizontal and vertical sync. They control where the data going to the video screen will be drawn. If the sync isn't set right, strange things can happen to the screen. You can see this happen when you play around with some of the controls on your TV. If a PMG is not set up properly, it too can lose sync. What you get looks like a constantly shifting bar of random dots. Someone's creative mind said, "This looks like an energy field in a space game!" And that's what they used it for. The only limits to programming are the programmer.

## O.K. Where is it?

You may have noticed that I have not explained how to make PMGs work. First, the subject of PMGs is so large it will take a long time to compile all of the information. Second, looking back, I decided that I, as well as my readers, needed a little time to breathe from the hectic "here it is, learn it, and use it" pace of the last few months. Third, I wanted to write an article that was somewhat philosophical rather than technical



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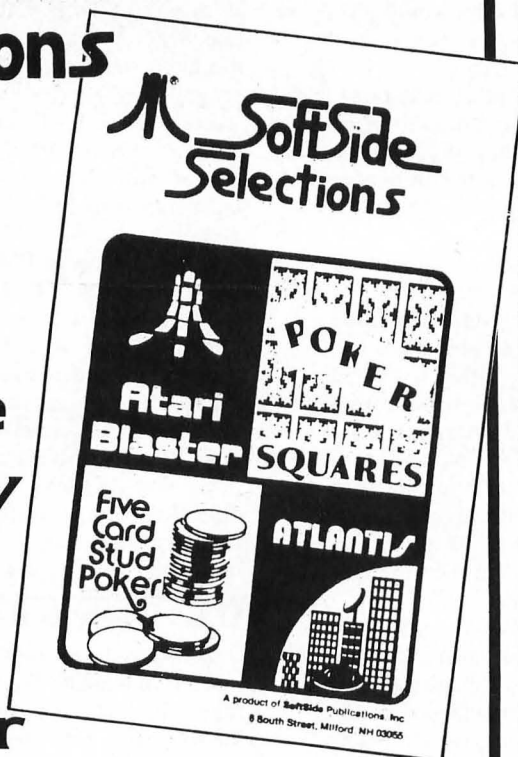
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# SoftSide<sup>TM</sup> Selections

## The Magazine Especially For Your Atari<sup>®</sup> Computer



Bound into the center of this issue, you'll find **SoftSide Selections**, the handy, pull-out booklet with program listings for your computer. If you bought your copy of **SoftSide** at a newsstand, your booklet contains this issue's Front Runner, **Poker Squares**, a competitive card game for the Atari<sup>®</sup>, IBM<sup>®</sup> PC, Apple<sup>®</sup>, and TRS-80<sup>®</sup>.

This issue, **SoftSide Selections** for the Atari features:

- **Poker Squares** — you always get the current issue's Front Runner!
- **Atari Blaster** — Fast, arcade-style action with sharp, high-resolution graphics. Alone with your computer in a space station, you must defend the Atari against nasty aliens who want to steal it...

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# ATARI<sup>®</sup>

## Atari Frontier, *continued*

for a change. My technical articles haven't sparked all that much mail here at *SoftSide*, and reader feedback is important because it lets us know what interests you. I encourage everyone who reads this to write in with your comments, ideas, and suggestions. As I have said before, we can all benefit from *your* knowledge. Fourth, and most important, this article introduces some important concepts which we will use in later work with PMGs.

I couldn't end the column without giving you something to whet your appetite. At the last minute, we whipped up a quick demo program that uses only the smallest part of the PMG's abilities. Type in Listing 1 and watch. It proves that only a little code can go a long way. Just to make sure you come back to read next month, we're going to leave the explanation of the Listing for Frontier #8. Until then, try experimenting a little and enjoy your Atari.

### Program Listing 1

```

10 RESTORE :GOSUB 500
20 FOR X=0 TO 35 STEP 2
30 A=A+1:IF A=4 THEN A=1
40 COLOR A
50 PLOT 79-X,Y+6:DRAWTO 79-X,47-Y
60 PLOT 78-X,Y+6:DRAWTO 78-X,47-Y
70 DRAWTO X,47-Y:DRAWTO X,Y+6
80 PLOT X+1,47-Y:DRAWTO X+1,Y+6
90 Y=Y+1:NEXT X:GOSUB 400
100 IF Z>50 THEN GOSUB 400
110 W=INT(RND(0)*2)
120 Z=Z+1:POKE 53248,122+W
130 POKE 704,INT(RND(0)*16)*16+10
200 AZ=PEEK(708):POKE 708,PEEK(709)
210 POKE 709,PEEK(710):POKE 710,AZ
300 FOR X=0 TO 26:NEXT X:GOTO 100
400 X=INT(RND(0)*16)*16:Z=0
410 POKE 708,X:POKE 709,X+4
420 POKE 710,X+8:RETURN
500 P=PEEK(106)-8:POKE 106,P
510 POKE 54279,P:GRAPHICS 21
520 POKE 559,46:POKE 53277,3
530 POKE 704,0:FOR X=512 TO 768
540 POKE P*256+X,0:NEXT X
550 FOR X=578 TO 584:READ D
560 POKE P*256+X,D:NEXT X
570 POKE 53248,124:FOR X=708 TO 712
580 POKE X,0:NEXT X:RETURN
700 DATA 34,65,93,119,93,65,34

```



# SLIME

Reviewed by Richard E. Herring

Aliens have actually invaded — it's not a science fiction movie this time. There you sit at your CRT screen, deploying the last of earth's defenses. Of all military forces, only a few naval warships have survived the aliens' brilliantly simple offensive — their saucers seed the clouds and the resulting slimy precipitation raises the level of earth's oceans, dooming mankind to a watery grave.

As your warship drifts back and forth between two Gamma-Tube Absorbers, you control the defense in a swollen, turbulent sea. With orders to stop the alien offensive, you employ three tactics. First, you try to shoot down alien saucers when they are in range. Second, you use your ship's Gravitron support beams to suspend up to twenty wedges in the sky. If the wedges can be formed into huge ramps, the slime falling from the clouds will be deflected into the Gamma-Tube Absorbers and neutralized. Third, and least efficient, if the slime falls between or is caught by the wedges, you blast it in midair. You aim your shots and position the wedges with a joystick-controlled cursor.

Preventing falling objects from hitting bottom is similar to the concept behind APX's *Avalanche* and Synapse's *Chicken*. *Slime*, however, adds an exciting twist. If you position rows of wedges properly, you will not actually have to shoot each drop of slime, which falls from about the middle of the screen. You'll struggle to keep the wedges in place, however. Alien saucers, tracing zigzag patterns through the sky, knock out wedges. So do the fireballs, loosed by those same saucers or by saucers hidden in the clouds. Frequent bolts of lightning from the heavily

from Synapse Software, 20 Coventry Road, Kensington, CA 94707. System requirements: Atari 400/800/1200 with 24K (disk) or 16K (tape), and one to four joysticks or trackball. Suggested retail price: \$34.95 (disk or tape); \$44.95 (cartridge).



seeded clouds destroy wedges, as well as drops of slime. And, when you place your twenty-first wedge, another wedge disappears.

*Slime* progresses steadily to more difficult levels. Inevitably, some slime falls into the sea, causing the water level to rise. This leaves less room between the clouds and the sea. As play progresses, many wedges, falling slime, lightning, fireballs and enemy saucers are packed into a small piece of sky. Speaking of heavily populated skies, I forgot to mention your helicopter. Periodically, if you do not shoot it down, an alien saucer drops a huge plug into one of your Gamma-Tube Absorbers. This prevents the absorber from neutralizing any more slime. Your helicopter can pull the plug if, and only if, you can protect it from the falling slime. If you cannot save the helicopter, all is not lost,

however. The next time the sea rises, it washes the plug down into the absorber.

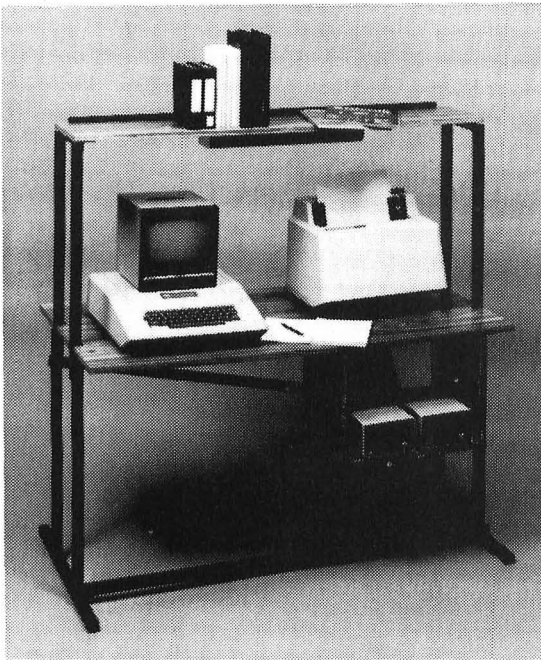
The screen in *Slime* is somewhat drab because of the large area of black sky with dark blue clouds rolling overhead. Nonetheless, using high resolution graphics, Steve Hales has managed to get two shades of each of four colors on the screen. Your score, the number of ships remaining, the number of unused wedges, and the number of the storm (or screen) you are playing are all displayed in the clouds. If you begin the game with the first storm, twelve wedges are placed automatically for you. These form a perfect sluice to channel the slime into the absorbers. On each succeeding screen, you receive two less wedges.

You can toggle to a second screen which allows you to establish several options, including the selection of one to four players. (My one criticism of the game is that there is no constant display of the number of players or, indeed, of who is playing — only brief messages flashed on the screen.) Further, you may select the number of reserve battleships, the number of points necessary to earn a bonus ship, and the number of points needed to drop the water level back to the bottom of the screen. Finally, you may choose to start with any storm from one through eight. The advanced storms have more lightning, more fireballs and raised sea levels, but you receive 2000 bonus points for every storm you skip.

*Slime* is 100 percent Machine Language with good sound effects for the lightning, saucers, helicopters, etc. Even the initial screen displays an interesting variety of information, rules and graphics. And wait until you score some points. At certain levels, the game is interrupted with consoling messages like "You Are Doomed" or "*Slime* Rules."

At its easiest levels, *Slime* is very playable. At advanced levels, it is frustrating and challenging. At all levels, *Slime* is well-executed and a great deal of fun. ES

## New Products




## Organize Your System

The *COMPU-TABLE* is an affordable, home-use computer table that organizes your computer and all its peripherals into one neat, efficient, space-saving area. Its special features include a built-in printer slot, built-in cord and ribbon slot for flush-to-wall fit and tangle-free wires, and correct height for fatigue-free keyboarding.

With *COMPU-TABLE*, you can design a system to fit your individual needs. Tops are interchangeable and you can purchase them in conversion kits as space requirements expand. For even more work space, a matching printer stand is available.

*COMPU-TABLE* is available in three sizes, and prices start at \$53.95. For more information, contact: Compc Industries, Inc., 159 West Walnut Street, Painesville, OH 44077. (216)354-4186.


## Mainframe Editing Power for the TRS-80

 *EDM*, the programmable File Editor, can edit BASIC, three different Editor/Assembler formats, two Word Processing formats, and Machine Code. It has "unformatted" file access, ideal for work with data files. *EDM's* cursor mobility is excellent. The keyboard is interrupt-driven, with a 128-key type-ahead buffer, assuring no lost keystrokes regardless of how fast you type. The editing is truly full-screen, with insert and overtype modes of entry.

*EDM* comes with a 290-page user/reference manual. It features a "New Users" chapter and a quick reference card. There is also a telephone support hot line.


*EDM* requires a TRS-80 Model I or III with 48K and disk drives (at least two drives are recommended). It sells for \$149, which includes all documentation and hot-line support. The documentation can be purchased separately for \$25, which can be applied towards the purchase of the software. It is currently available from: The Alternate Source, 704 N. Pennsylvania Avenue, Lansing, MI 48906 (517) 482-TASO.

## FORE!

 *Statistician* brings computer-assisted training to golfers who want to improve their games quickly and easily. Written in easy-to-understand terminology, *Statistician* asks the golfer questions related to impact feel, initial direction, resultant direction, trajectory and relative distance for each stroke taken. The computer formulates these answers into meaningful statistics based on the five absolute ball-flight laws of golf: centeredness of impact, clubhead path, clubhead angle, angle of attack and clubhead speed. A manual analyzing a sample round of golf accompanies the program.

*Statistician* requires a 48K Apple II+ with DOS 3.3 and Applesoft™. It sells for \$34.95 and is available from GolfSoft, Inc., 10333 Balsam Lane, Eden Prairie, MN 55344.

## PC PEEKs and POKEs

 *PC Peeks 'n Pokes For The IBM Personal Computer* is a collection of programs and techniques which allow the the PC programmer to perform many useful functions otherwise unavailable from BASIC or Pascal. The disk and the 38 page manual illustrate the use of the BASIC PEEK, POKE, INP, and OUT functions to access and modify system information. The package includes general purpose assembler subroutines that perform DOS and BIOS function calls, read the file directory, and determine the space used and the space available on a disk. For the Pascal programmer, assembler subroutines are included that perform the same functions as the BASIC PEEK, POKE, INP, and OUT functions.

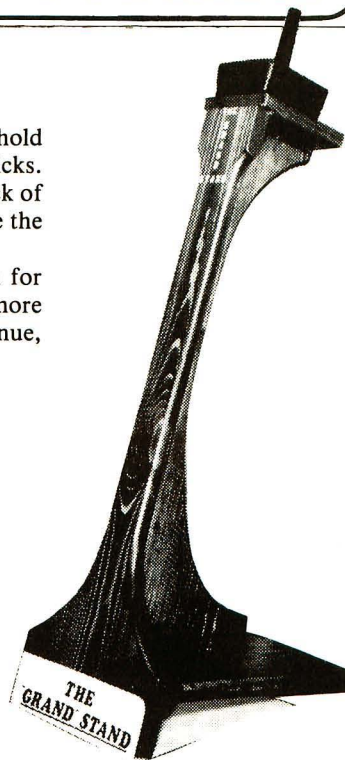
*Peeks 'n Pokes* requires an IBM PC with at least 48K RAM, PC-DOS, one disk drive and an 80-column monitor. Its retail price is \$30, plus \$2.50 shipping charge. It is available from Data Base Decisions, 14 Bonnie Lane, Atlanta, GA 30328 (404) 256-3860.



## Take The Pain Out Of The Game

The "Grand" Stand is currently the only joystick floor stand available in the U.S. It is designed to hold the joystick firmly in place at a comfortable angle and height, and accommodates most popular joysticks. It has an angled platform at its base for the player's feet which keeps the stand firmly in place. The neck of the stand arches up between the player's legs, positioning the joystick approximately 25 inches above the floor. This design results in greater comfort, improved dexterity, better control and higher scores.

The "Grand" Stand comes in two models; one solid wood model with a furniture quality finish for \$34.95, and a plywood model, with a simpler design, for \$23.50. There is a \$5 shipping charge. For more information, or to order *The "Grand" Stand*, contact The Grand Stand Co., 4231 Bluebell Avenue, Studio City, CA 91604 (213) 766-1722.

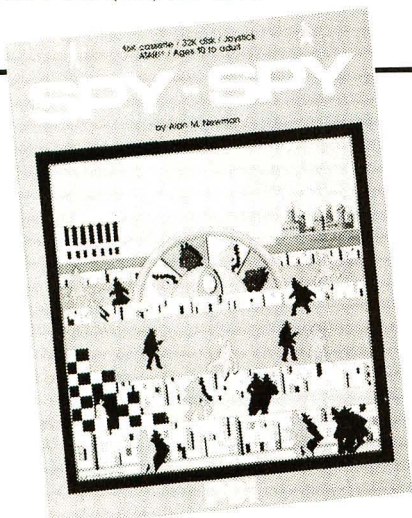


## Touch Typing Tutor

The *MasterType* combines electronic game technology with education, teaching typing skills in a video space war game format. Seventeen progressive lessons allow each user to develop keyboard mastery at an individual rate. Each row of keys is separately introduced, presenting individual keys first, and building up to words. After each lesson, a report indicates the number of words typed per minute and words misspelled or destroyed. For individuals interested in creating their own lessons, a Make Lesson feature is provided.

The *MasterType* package includes a manual containing directions for running the program, descriptions of the options and their educational implications, and hints for winning the game. Finger charts for the keyboard, suggestions for successful touch typing, directions for customized lessons and descriptions of the seventeen preprogrammed lessons are also included.

*MasterType* is available for both the monochromatic and color display IBM PC with 64K memory and one disk drive, the Atari 400/800 with 32K memory and one disk drive, and the Apple II or IIe. For more information, contact: Lightning Software, P.O. Box 11725, Palo Alto, CA 94306 (415) 327-3280.



## Spy And Spell On Your Atari

*Spy vs. Spy* is a word game with a theme. One or two spies (players) try to guess the secret word that will allow entrance into the embassy. The secret word contains four letters, and the spy uses a joystick to write a "guess" word. The computer provides clues following each guess. The player has twelve chances to guess correctly, and then the computer reveals the secret word.

If a spy accomplishes his mission, he's paid in "coin of the realm," and earns a bonus if he works quickly. If he does exceptionally well, he may earn the title Super Spy, but those slow to complete their missions may be dubbed — oh, horrors! — James Bomb.

*Spy vs. Spy* is available for the Atari 400/800 in a 16K cassette version for \$18.95, and a 32K disk version for \$23.95. It is available in retail stores, or directly from Program Design, Inc., 95 East Putnam Avenue, Greenwich, CT 06830 (203) 661-8799.



## Back Issue of the Month: November 1982

This time, *SoftSide's* featured back issue is Issue 34. This was the Music Issue, and *SoftSide's* first issue to feature programs for the IBM® PC. Our very first programs for "Baby Blue" were *PC Blues Box*, a music editor in Advanced BASIC, and *Squish*, a programming utility to compact BASIC programs.

Apple® /Side features *Sabotage* and *Fugue*, and the DV enhancement was *Auto Menu*. For the TRS-80®, Issue 34 offers *Tune-In* and *Puzzle Jumble*, and the DV features *Cavern Quest*. Atari® /Side serves up *Pokey Player*, with *The Rotberg Synthesizer* as the DV.

Plus, you can explore the *Atari Frontier*, alphabetize catalogs with *Apple Discourse*, learn about the future of books with *Entertainment Tomorrow*, and enjoy the usual abundance of reviews, columns, and articles. So come on, and listen to the music!

# FOR ATARI FROM MMG MICRO SOFTWARE

## BASIC COMMANDER



PRICE \$34.95  
Requires 16K  
Disk Only

- **Single key entry file commands**
  - ENTER "D": — SAVE "D":
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  - FORMAT a disk — LOCK a file
  - RENAME a file — UNLOCK a file
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- **THREE PROGRAMMABLE KEYS!**
  - single keys programmed for your own use, even whole subroutines
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  - deletes any range of lines instantaneously!
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  - renumbers lines and all references
  - extensive error trapping
  - 3 seconds to renumber 500 lines



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  - examine variables' values
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- **Spill screen mode**
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  - scroll each window independently
- **CROSS REFERENCE**
  - provides a list of variables and the line numbers in which they are used in your program
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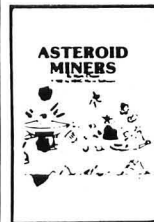


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Apple/Side challenges your reflexes with *Photon Flyers*. *Hello Hider* is a clever utility to save disk space.

For Atari users, we have *The Family Tree Organizer*, and *Screaming Demon*.

TRS-80's entry is *Life II* — the classic struggle for survival.

Software reviews include *Volkswriter*, *Apple Writer II*, *The Word Plus*, *Spellwizard*, *Atariwriter*, and *Bank Street Writer* (Apple and Atari versions).

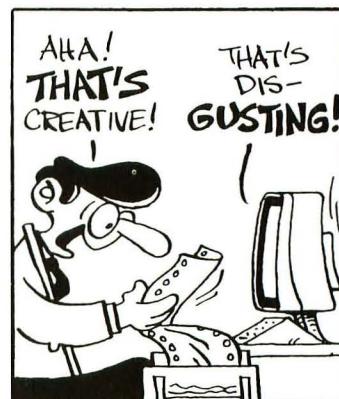
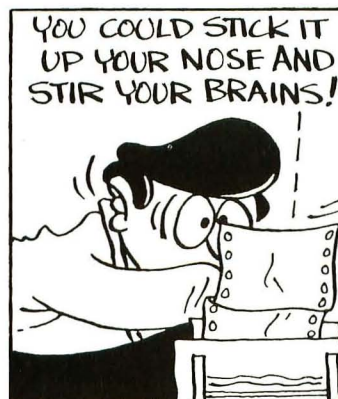
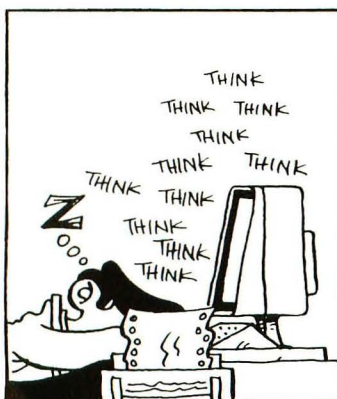
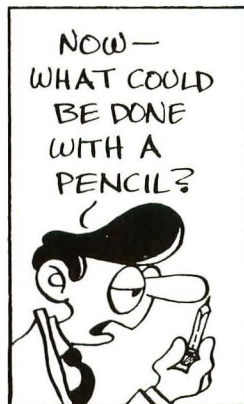
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## MACHINE HEAD

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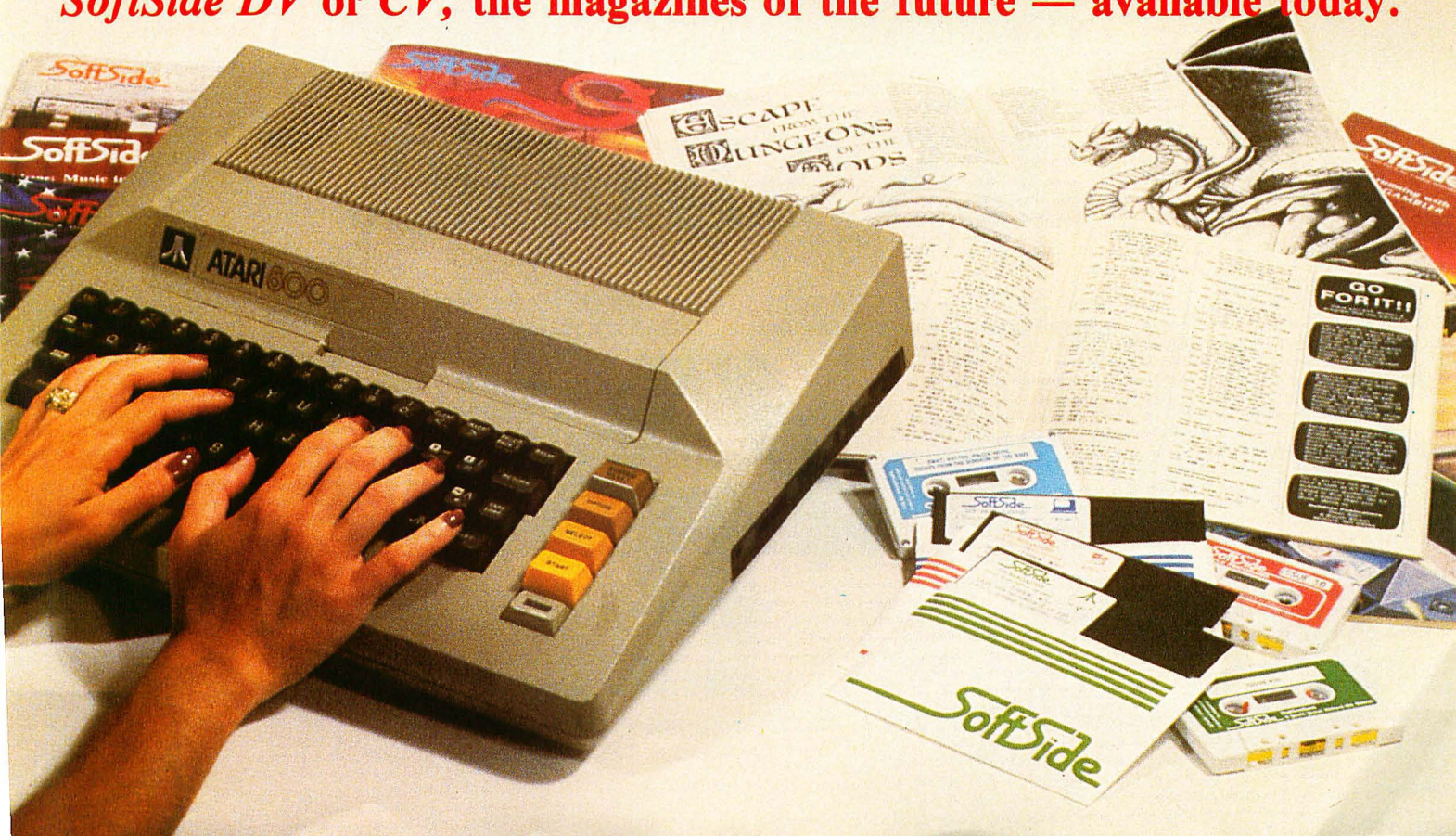


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