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Sherlock Holmes had Watson...now, YOU can

Dear Friend,

Suppose you could spend a little time each month with some of the world's most astute programming wizards, hardware and firmware genuises, systems analysts, wargame and adventure simulators, and a variety of other top professionals - men and women who understand computers and can talk to you in a language which you will be able to follow. Suppose you could get their views and learn their techniques on a host of subjects which relate to the home computer, an often frustrating beast.

Suppose too, that you could find out how these people are successfully dealing with the ever-changing technology of the home computer, with the special conditions that confront both neophytes and masters alike. Suppose there was a magazine which carefully examined the problems facing all segments of microcomputing and explained in patient detail the solutions. . .

Wouldn't it be worthwhile? Wouldn't it help you or your family members hone their skills to razor sharpness? Wouldn't it help give you the added ammunition you need to wage war on an equal footing with the microcomputer? Wouldn't it give you greater confidence?

If you were among the **Fortune** 500, you could retain all the specialists you want. Such luxuries usually aren't feasible for the average household or small businessperson. But now, at least, you can get the next best thing - at a price that won't even put a dent in the ol' cookie jar.

It's **Softside**, the new magazine for those interested in home computers, and who require authoritative, reliable information, but who can't get it from existing publications in a fashion which can be understood. If you can't justify the fees that top professionals command, and are desperately searching for ONE publication which YOU and the members of your family can turn to for solutions to your home computer problems. **Softside** is the answer. Every month in the pages of **Softside** you get facts, figures, advice and counsel targeted to your home computer needs, in a way that your entire family, from student to working parent, will fully follow and understand. Contained within the pages of **Softside** will be software listings for your TRS-80, Apple and Atari, ready to be entered.

In a moment I will explain how you and your family can try out **Softside** and judge its value for yourselves, at a discount of 37½% off the regular price - and at our risk. However, before I give you additional information about the charter subscription, let me tell you more about **Softside**.

To be frank, the magazine grew out of our own frustrations with running a small but rapidly expanding publishing company. My associates and I searched the "big business publications" in vain for articles that were written with the home computer user in mind. We then turned to several of the more recent entries into the microcomputing magazine field, but to no avail. In almost all of these publications we were unable to find consistency in their editorial direction. What had begun as magazines for business. . .home. . .fun, in no time turned into publications crammed with page after page of boring advertisements and, too often, high level articles describing sophisticated procedures, understood and appreciated only by an elite few.

We talked to other people in microcomputing from all over the country. We took a survey. And the findings confirmed what we suspected: No single magazine was providing the kind of information in a consistent fashion which ALL home computer enthusiasts could fully follow and understand.

So we decided to upgrade **Softside**. Our editorial people were instructors at universities such as California State and Northern Illinois, teaching computer science and mathematics. Other members came from publications such as **Kilobaud Microcomputing**, **New Hampshire Profiles** and **Yankee Magazine**, and a number of other trade and business publications. What they have in common is that all-too-rare combination - the ability to tackle timely topics and present them in an understandable fashion.

Our signature of quality.

TSE began in the basement of our publisher's home. In those days we did everything from reviewing submissions, writing documentation, and duplicating cassettes, to licking envelopes. There was correspondence with the authors, telephoning, equipment problems, authors' contract negotiations and more and more envelopes which needed stamps.

TSE explored the 'software' territory in those 'frontier days' carefully . . . scouting out only the very best, leaving the weaker pieces by the roadside. The number of submissions was increasing, and we had all that we could do to provide proper service for our customers. We decided then and there that we would publish only 'the' very finest software available and commit ourselves to a policy of 'selectivity' and strong customer service.

Well, it worked . . . . Since those days in the basement we have grown from a Mom and Pop operation with a dozen software titles to a company with 40 employees and over 500 titles. TSE distributes software for over 50 different vendors. We considered ourselves 'pioneers,' and as such we learned many things about our business and about our customers. We've made mistakes . . . who hasn't, however, the two most important factors in our success have been a keen eye towards selecting good software and a commitment towards strong customer support.

We think that you will profit from TSE's experiences and come to find a consistency in product selection and a mandate to continued customer service in the months and years ahead.

William F. Gollan
Marketing

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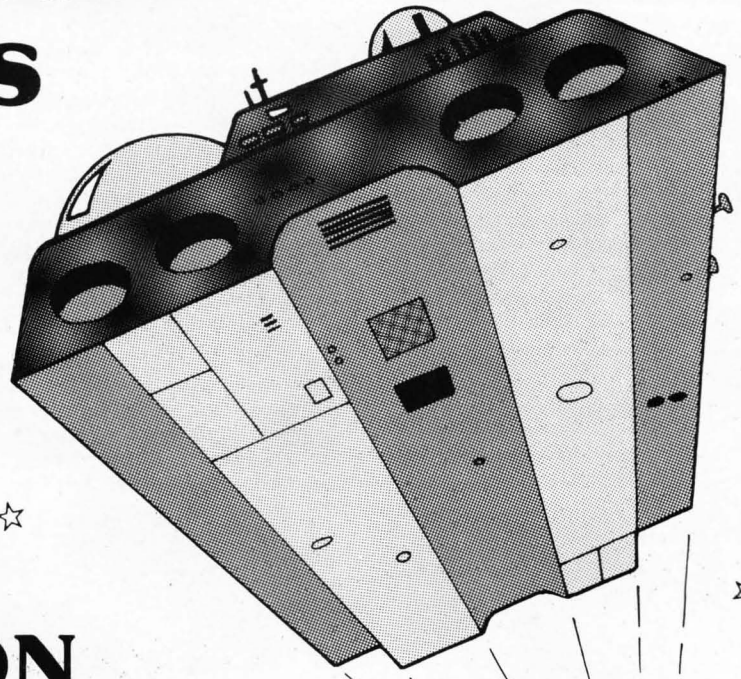

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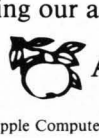
TRS-80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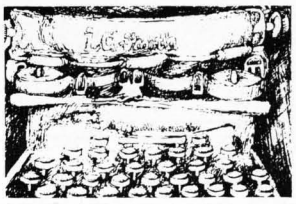


EDITORIAL

by Mark Pelczarski

As summer dwindles into fall I find myself faced with the possibility of going to a few computer shows, representing **SoftSide** . I've been to a computer show before. Once. It was a somewhat unique experience. The closest thing I can compare it to is standing in the center of a shopping mall on the day after Thanksgiving. Not that it was all that bad. In fact, it was probably more like standing in a toy store in a mall on that day.

I haven't been to a show with **SoftSide** yet. Since I made my merry way out here from Illinois in May, things have been moving quite quickly. First there was gathering of the various pieces of **SoftSide**'s Apple version and trying to assemble a magazine for the first time. Then we sat down and planned "**Super SoftSide**," as we called the new, large format. Now that's reality, and although we're still working on improvements, we have rounded out the editorial content with some new columns, and the program documentation has gotten better. Let us know if you have any comments or suggestions, as we value your input.

Anyway, with the magazine reaching a more stable level and at least becoming less hectic, it's probably time to broaden horizons and take in a couple of computer shows — from the other side.

I can't see approaching shows as media events, as some others do, so don't expect any lengthy "show reports." I am however, looking forward to some personal contact with some of our readers, and others in the profession. As a teacher, one becomes accustomed to face to face contact and a lot of feedback. Not so with editing. You learn to talk on the phone a lot and hope that things you write make sense to unseen readers.

The computer show I attended a few years ago in Chicago did leave some definite impressions. I remember the room. People were crowded around the booths from which the most interesting sounds emanated. Speech synthesizers were making big breakthroughs that year and those booths seemed the most popular. Some nice computer music systems were on display. The main competition was whose booth could draw the biggest crowd with the flashiest computer game. Droves of people floated from one booth to another waiting for the ultimate dazzle. Some poor fellow was selling modems in an end aisle. He had some wonderful spec sheets, but what could you say to him? "Yep, sure looks like you could plug a telephone right into that thar thing . . ." Actually, the whole show was sort of like that.

"Yep, by gosh, those sure are computers. Look at all them fancy boxes . . ." Some had flashier displays than others, but when we finally retreated, the fact sheets all looked very similar. It was kind of like the shopping bag full of material you can accumulate at auto shows. The only real feeling in the aftermath was upon arriving home to the TRS-80 I had at the time. I walked right up to it, looked sadly at the lack of boxes hooked into it, and admonished, "Why can't you talk? Well, come on, say something . . . Play a tune, go ahead! And how much memory do you have? 16K? Huh! I just saw one with four times as much . . . and a hard disk to boot! How about color? Do you have that?

Noooo. . ." The poor thing just sat there and took the abuse. It seemed so plain.

Hope to see some of you at the shows. Stop and say hi.

An Apple One Liner

This One Liner is in Integer BASIC:

```
1 GR : FOR Q=1 TO 10000: COLOR=
  RND (16):X= RND (39):Y= RND
  (39):Z= RND (39): IF Y<=X THEN
  NEXT Q: HLIN X,Y AT Z: VLIN
  X,Y AT Z: NEXT Q: END
```

Matthew Laurence
Lincoln, Massachusetts

ONE LINERS

Scattered throughout the pages of this issue, you will find some very short programs called "One-Liners". You can contribute to this department by following three rules and sending your contribution to:

S-80
Atari (pick one)
Apple

ONE-LINERS
c/o SoftSide Magazine
6 South Street
Milford, New Hampshire 03055

RULES:

1) The program must be written as a single line of BASIC.

2) The program must be self-contained. Make no assumptions about DIMensions, available string space, current graphics mode, etc.

3) The program should provide a continuously changing graphics display, as impressive as possible.

NOTE: Our Amazing Art Room Cuties are currently creating the coveted "One-Liner Award" to be presented to all past, present, and future authors who have their One-Liners published. Be the first on your block to win one!

THE NAME OF THE GAME

Give a computer some numbers to sort and it's computer heaven. Give it some names to deal with and things can get a bit messy. Anyone who has watched a computer spew out address labels should have some idea of what I am talking about. For some reason (no, I don't need to have it explained to me) computers don't know how to read a list of names and understand them the way we ambulatory types do. Instead, the computer goes for what looks right to it. The results can often be confusing, and just as frequently hilarious. One friend of ours, the fourth in a long line of MacFarlanes, recently received his first computer-generated form letter, addressed to William MacFarlane IV. It began:

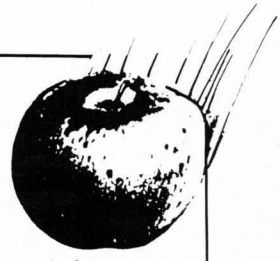
"Dear Mr. Iv..."

Another friend of ours, a bank teller by profession, ran across a computer-written sweepstakes offer while working for the Wells Fargo Bank. It read:

"Could $50,000 change your life, Mr. W.F. Bank?"

Get the idea? Here at **SoftSide** we know that these two instances of computer name-mangling are not isolated occurrences. We also had a good laugh recalling them. Not being the laugh-miser types, we thought we would share them with you, our readers, and see if you had any similar tales to recount. If you have, write to us and tell us about them. We'll publish them somewhere between the covers and let everyone in on the fun.

FROM STRATEGIC SIMULATIONS . . .

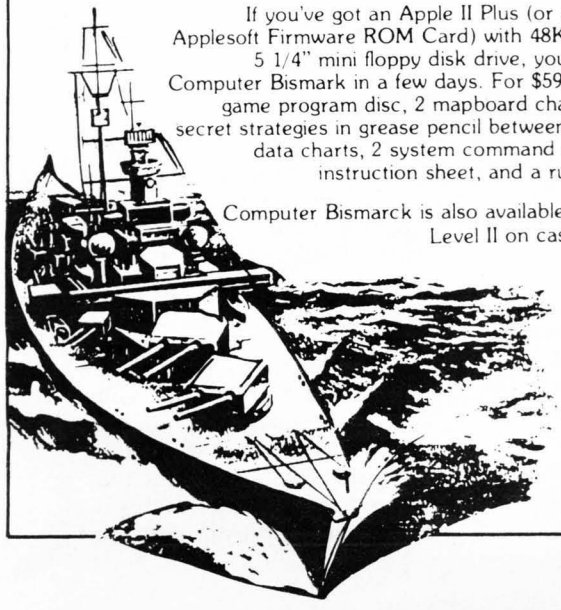


Sink the Bismarck!

Historic wargaming may be the only intellectual hobby which creates more intensely devoted fanatics than home computing. When two wargamers spend an evening refighting a famous battle, they'll spend several hours happily setting up the gameboard, firepower charts, unit strength tables and so forth . . . all before the first shot can be fired! There are such paper and pencil simulations of every famous battle from Shiloh to El Alamein. If you've ever tried one, you already know the excitement and challenge of trying to be a better general than Rommel.

If you've got an Apple II Plus (or an Apple II with Applesoft Firmware ROM Card) with 48K memory and a 5 1/4" mini floppy disk drive, you can be playing Computer Bismark in a few days. For $59.95, you get the game program disc, 2 mapboard charts (for plotting secret strategies in grease pencil between moves), 2 ship data charts, 2 system command cards, a loading instruction sheet, and a rulebook. $59.95

Computer Bismarck is also available for the TRS-80 Level II on cassette for $59.95



Ambush!

Computer controlled mapboard of a typical French village.
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INPUT

Dear **SoftSide**,

In this season of "equal time" I guess it was bound to happen. And all this time I thought an apple was something you made into a pie, or sauce, or butter. Until I looked at the cover I thought someone had slipped me a **Kilobaud**.

All seriousness aside, the August issue looks great and I am sure that once the intial shocks wears off, most of the readers will agree. There are probably some Appleists out there who have never heard of a TRS-80 either. You do mail to Outer Mongolia, don't you?

Here are a couple of items which you or the readers might find of interest.

Take Rich Bouchard's great little One-Liner from page 24, and assign line # 100 to it. Put a REM statement at line # 10, and run the resulting program with BREAK and then SHIFT ENTER (the T-Short command for GOTO 10). The four set points will now reappear on the screen in the position they occupied when you completed the previous design.

Now granted, you no longer have a nifty one-line program. But you do have a more flexible format for creative design. It simply takes a fun program and adds to the interest.

Last spring I purchased a TC-8 cassette interface (before the price increase) and enjoy using it. But all the plugging and unplugging gets to be a hassle. A visit to the local SHACK and a word of prayer with the resident computerist provided me with the necessary parts and technical data to build an interface for my interface, if you know what I mean. Now, everything stays plugged in and is controlled with two switches. If you think there would be enough interest in such a concoction, let me know and I'll detail it out for you.

By the way, I need someone in your office to check out something for me. The other night, after reading James Garon's OUTGOING MAIL article, I had a dream. Seems that some dude in a cape, with a neon B on his chest, goes running up and down the town's sewer excavations looking for dragons or treasure or somesuch. If someone on your staff will check this out with the local newspaper or police department and confirm the report, then I can get my "Resident Psychic" certificate.

Best Wishes,
Jeff Briner
Hickory, NC

P.S. The above modifications to Rich's program will also work with IRV if you reprogram one of the keys to read "GOTO 10 (ENTER)"

Mr. Garon:

As I mentioned in the enclosed reader survey, the most useful service that **SoftSide** could perform, in my estimation, is the reviewing and criticism of new software, specifically games and simulations. The most important single piece of information that could and should be provided in a game review is:

Can the game be "solved? "If so, how long (in playing hours) will such solution take? (One assumes that players have the good taste not to peek at the code.) And finally, does the solution make sense, given the precept of the game?

For example: I played TAI-PAN once before I realized I was up against a random-number generator, not a simulation (any game which rewards buying silk in the Phillippines and selling it in China cannot, by any stretch of the imagination, be called a simulation). Armed with this knowledge, I wiped out the game: a human can always beat a random-number generator, once you get a basic idea of the range of the generator.

I'm a wargamer from way back, and there exist wargames with primitive graphics, laughably simple resolution systems, and abundant illogic, but those games are still played - because they cannot be solved for one side or another. How many computer "simulations" will be around as long?

A basic property of a good computer game, then, is resistance to solution. The ADVENTURE type games are one attempt to resist solution - the basic idea in these games is that there is a solution, but that solution is hidden within a puzzle-box of puzzles. ADVENTURE type games are very entertaining until they are "crashed" - but the essential point is this: A player can and will find out everything there is to know about the puzzle, whereupon it will become boring. True, that might be a looong time, which will give the owner of the game ample value for his investment, but it is inevitable.

The only unsolveble games, though, are those where the player does not play the computer's program, but rather uses the program as a vehicle to play against another HUMAN opponent. Such games are insoluble (usually, unless very poorly written) because it is never entirely certain what a human opponent will do: a human opponent will vary his strategy (very tough for a program) as well has his move-by-move tactics (easier, though by no means easy, for a program) in unexpected ways so that any game not irreversibly tilted towards one side will never be a sure thing for either side.

Potkin's KRIEGSPIEL is an excellent example of an insoluble game of infinite variety. It has all of the trappings of a "wargame," right down to a hexagonal grid for movement, but it has to be the most simplistic wargame I have ever seen. Game publishers GIVE away much more complex games as advertising come-ons. Yet, KRIEGSPIEL is one of the best computer games in existence, simply because it cannot be solved. A person playing KRIEGSPIEL is playing a game against another person, who cannot be predicted with accuracy. The computer is used simply to keep track of what is going on, and to ajudicate and administer the rules of the game.

There are other good games in existence: GALACTIC REVOLUTION, for instance (though GR is, perhaps, too complicated, which causes it to drag and limp from move to

move), but the software reviews I have read all seem to miss the point about games.

Until recently, the writers of computer games were, evidently, excellent programmers but knew little about games; it is time, I think, that software reviewers catch up. As a game player, I couldn't care less about elegant programming techniques or flashy displays, unless those frills made a better game.

So how about it - have you got a gamer up there who can compare the latest computer game to his favorite wargame? If so, get his opinion, and let the rest of us know what it is.

Thank you -
Wesley D. Ives
Raleigh, NC

Dear Mr. Garon

Congratulations on the "new" **SoftSide**! You have now taken the first step in becoming the best magazine for small computer users going.

I found the addition of many instructive articles the best new feature, although I had problems getting my machine (a TRS-80) to produce sound.

Your article on the VARPTR function was very interesting and informative. The manual that came with my computer only touched on what it does, rather than what you can do with it.

Reading that article prompted me to do some experimenting of my own. I keyed the "One-Liner" from the August issue (an excellent piece of programming) as well as your routine to transfer the screen to the array, T$. To this combination I added:

```
0 CLEAR 2040:DIM T$(15):T$="":INPUT
  "DRAW (1) OR READ (2) PICTURE
";A$:IF A$="2" THEN 3000 ELSE CLS
```

I then deleted the LLS: in line one as well as your line 1000 so as to avoid a BS error that would have been created by the CLEAR statement. (I changed the DIM statement to line 0 so that you could read the tape without yet a third DIMensioning of T$.)

Another change I made in your work was to renumber the printing routine by adding a 0 to the end of each line number. I added the following lines myself.:

```
1100 FOR I=0 TO 15:PRINT #-1,T$(I):NEXT:
     GOTO 0
3000 FOR I=0 TO 15:INPUT #-1,T$(I):NEXT
20600 GOTO 1
```

These lines save a picture, and when a picture is read using line 3000, allow you to add and save more of the same picture.

Pass it on,
Matt Rosenberg
Dobbs Ferry, NY

Gentlemen:

First, I would like to congratulate you for your excellent magazine. A friend of mine had one and I borrowed it, after keyboarding in all the programs, I went to a computer store and bought another. I have since decided to subscribe to your magazine and not buy any software from Radio Shack, which costs more than it's worth. Besides, I can get about $18 worth of Radio Shack software in only one issue. So I am enclosing a subscription form.

However, there is one thing that you can do to make your magazine even better. I am a fairly decent typist, but I always make a few mistakes keyboarding a program in. Then I come to the hard part, debugging. I can usually correct my own mistakes, since I know that I have a tendency not to press the shift key when I type a left parenthesis, or that I sometimes type in an O for zero. I don't have any problems with my mistakes but with yours! In a program as long as Star Trek 3.4 it is very hard to find typos committed by your typist. Even in a short program such as Isolate or Numbagels there are mistakes. I have since learned that your typist constantly types RO for OR and is not so good at keeping variables and strings straight. I have only had my Level II TRS-80 for two months and have problems correcting mistakes involving more complicated procedures. If possible, why don't you type two different copies of a program and compare them, correcting any differences. Since two different typists won't make the same mistake on a line, it would improve the accuracy of the program printed in the magazine. Think about it.

Sincerely yours,

Barton P. Scott

Dear Barton,

Glad to hear you like the magazine, but what we'd really like to know is just who is "our typist?" To the best of our knowledge, there is no such person. When a program is published in **SoftSide** *we simply load a correctly working version into the proper computer and then have the computer list it on the lineprinter. From whom did you "learn" about our mythical typist's bad habits? Whatever else this person may tell you in the future, take it with a grain of salt!*

Dear Sir.

In your July issue Sherry Taylor points out a super simple alternative to Ed Ting's "Super Simple Sound Interface for the TRS-80," but why waste a perfectly good blank tape (unless you happen to want to listen to the beeps, and sounds of your last game of Micro Pinball)? Just push the little button on the left-back side in the tape compartment and, at the same time, press Play and Record.

Thank you,

Tim Irvin
Asheville, NC

Dear M.P.

I would like permission to use the hex data load routine used in INVADERS (pg. 44, May, 1980) and MAGIC PAINTBRUSH (pg. 48 June, 1980) for use in my programs probably some sent to **SoftSide**. I am developing a few programs, games, and utilities to send in.

I am going to scream if I don't get my August issue soon. It seems overdue.

Did you have MAGIC PAINTBRUSH named with your initials on purpose? Keep up the good work!!!

Apple-ly yours,
Daniel Wood
Oregon House, California

There's no problem with using the hex routines. Many of the routines we use are faily standard programming tricks. One of our goals with the new **SoftSide** *is to pass along these techniques in addition to the programs; hence the added documentation. So feel free to use ideas you find in* **SoftSide** *programs. That's their purpose.*

The initials in Magic Paintbrush *were inadvertent. Actually, several*

continued on next page

continued from previous page

people have asked if the "MP" in MP Software stands for Magic Paintbrush *or Mark Pelczarski. It's actually Magnificent Penguin.*
-MP

Gentlepersons,

I rarely write to a business, much less a publisher, but an event now justifies my doing so.

Yesterday, I received my first copy of the combined **SoftSide**. I was in the least, shocked, at the extreme, I felt ripped off.

When I first subscribed to **SoftSide**, I got what I wanted. A publication for Apple; about Apple; by Apple owners; and exclusively Apple. Even when the name changed to **SoftSide - Apple Edition,** I was not upset. Not even worried. But yesterday my faith in another industry was blown to smithereens.

On your open editorial, on page 4, I wish to reply, not to specifics, but to the entire thing. The original, and earliest editions of your Apple-oriented publication were published with editorial comment and advertising aimed at a specific audience: the Apple owner and users. The magazine was published with the evident intent of supplying Apple owners with Apple-oriented material without having to sift through tons and reams of other material. Dozens of other magazines had material for just about any machine you could name, but only one was specific. Only one had enough class to specialize. **SoftSide**. Now you have gone and done it. After I went and cancelled, or allowed to run out subscriptions to five other magazines, because I had found a source for Apple material, that did not need a search like the one for the Holy Grail to uncover the entire article. You have chosen the publisher's cop-out. The easy escape. The change that portrays cheapness. The inevitable worship of the dollar sign. My quest for the honest man is now over. I am now in the market for a reasonable facsimile or a decent fantasy of a real person doing a real thing. As to your cop-out, I guess that it could be expected. The might of the $$ (I don't mean a string variable, either!) and the greed in man that it excites has become apparent. again. It began in pre-historic times, with one cave man trading his dino-rabbit for a handful of pretty rocks. But back to you. You have evidently found that it is cheaper to print one large format, 95-page magazine, and satisfy a few readers, than it is to publish a magazine that will satisfy all who choose to subscribe. An additional note. It seems that you too, are succumbing to the pressure of the giant with the most money. To do so again confirms my belief that worship of the $$ reigns supreme. It seems that Tandy is soon going to own the world. They have more money to spend on advertising and they really take advantage of it. They are completely dominating the microsoftware market. It seems that they (Tandy) must be able to provide their own support and distribution for software. It seeems that IBM does rather well and Tandy must be approaching the volume of sales that IBM has in the computer market. I really get tired of hearing about the "Immortal Trash 80." Now you seem to devote the majority of your magazine to it.

Now for a return to a previous complaint. You as a publisher may know the reason, but I can't seem to figure it.

Why do you now start an article or a listing on one page, and then jump (unconditional, no return) to the back of the magazine ,or at least as far away as possible to make it hard to follow? Is there an unwritten law that says you cannot complete an article before adding advertisement? At times you do not even add advertisement, you just go right into another article. You haven't done that in the past. Did you do this because of the Great American $$?

I don't know. I really don't. I probably will not renew my subscription. I probably will sell my Apple, since my frustration has become complete. Have you any suggestions? Are you really human or are you just a defective chip in a memory somewhere? Are there any human beings left out there? I fear that I am the last human that is not part of the great media controlled mind. I hope that the individual is not lost.

From a human being,

Brian L. Thompson
Alexandria, La.

Since the August issue hit the stands we've had many letters and phone calls, some expressing delight over the new format, and others expressing disappointment over the changes. Although it's gratifying to hear the praise, it's also of concern to us that we've disappointed some of our long-time readers. We'd like to respond to some of the criticism we've received.

The complaints about the new format we've heard most frequently are from Apple readers concerning the TRaSh, and from TRS-80 readers about the rotten Apples. (Surprisingly, not many people have complained about the inclusion of the Atari material). We must confess that that was one of our greatest concerns in combining the editions, but we've taken extreme care in trying to keep the overall level of quality for each machine at previous standards. True, there may occasionally be one less program for a given system, but we've increased our budget and the actual quality of the programs you receive has risen considerably. It will continue to do so. Remember also that expectations are rising. To a large extent, we have created this, particularly in the TRS-80 market. Most authors of the TRS-80 games in BASIC subscribe to and learn from **SoftSide**. We pioneered in high speed graphics, sound routines, animations, and many other features commonly found in games today, and explained how to do them in the magazine. As a new technique comes along, we are careful to get the word out as quicky as possible.

We intend to maintain our leadership in this area, and increase our quality for every computer we support. We always pass along the best of what we get.

We have no intention of making **SoftSide** a general (lack of?) interest magazine. It is about software for specific computers. We've devoted a lot of staff time to making programs understandable so that you can actually get a feel for how they work. The former philosophy of **SoftSide** has been "Type them in and they'll work." Now we're trying to stress that, in addition to good programs, we can help you to learn techniques from other programmers to aid you in becoming a better programmer yourself. We're trying to provide

continued on page 10

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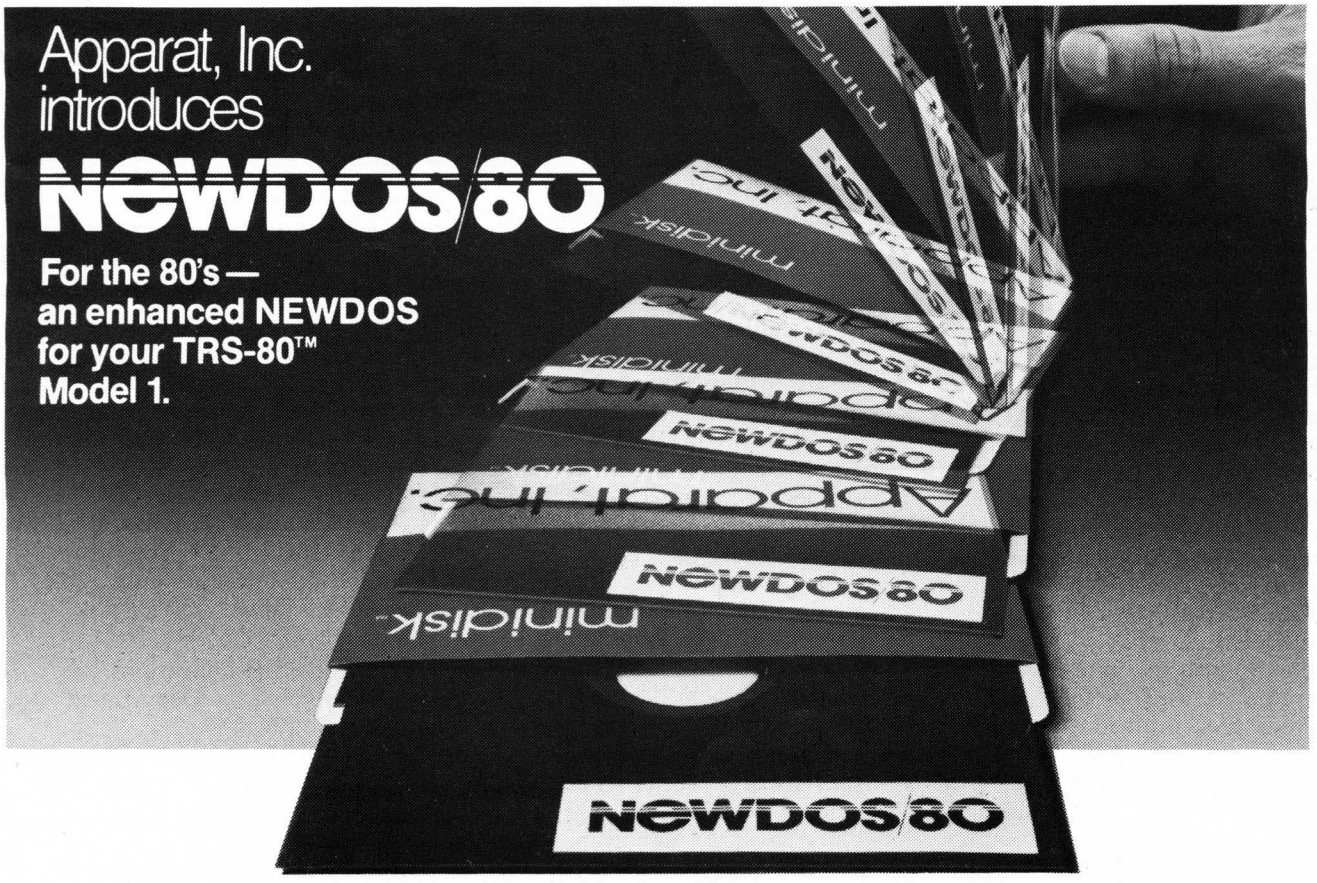

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INPUT
continued from page 8

more depth. We've made agreements with several top programmers who'll be joining us *in future issues* to write columns about programming. We want to tell you how, not just slap it down and say: "Here it is."

The reason for combining the **SoftSide**s was partially financial, but it was far from groping for the almighty dollar, as some of our critics have charged. We would be happy just making five cents a copy. To put together the kind of quality we wanted in separate editions would have involved a lot of expense and duplication of effort. Our art and production staff was down to producing one magazine a week. With deadlines that close, it's difficult to devote as much care to quality as we would like. Sponsoring magazines for new computers, such as the Atari, would have drained our resources even more.

We're not getting rich from this business, not even our publisher. Most of us could increase our salaries in industry and work shorter hours. We know - we've had offers. We are not a huge, money-grubbing conglomerate. We're basically hobbyists who enjoy what we're doing. We get to use the newest equipment and software, and to share our experiences with those of you who may or may not be computer professionals. Although the real money is in the business market, we're not at all ashamed to say that we're more interested in computers as a hobby.

As we do grow, and become more profitable, (and we sure hope that happens), we intend to share that bounty with you by publishing more material and paying our authors more for better programs and articles. That is as much in your interest as it is in ours.

As for the magazine itself, we figure that content, due to the larger format, has approximately tripled. To begin with, the pages are twice as large as the old ones. Less margin space is wasted with the larger format and on top of that, the magazine itself is longer.

For those of you who have complained about the dominance of TRS-80 material, keep in mind that the new **SoftSide** was combined from **SoftSide: S-80**, **SoftSide: Apple**, an unreleased **SoftSide: Atari**, plus **Prog-80**, a more technical TRS-80 publication. We intend to expand our technical coverage of Apple and Atari, but due to the existence of **PROG-80** we already had a wealth of material available, hence the initial imbalance. If you subscribed to more than one of those four publications, your subscription will be extended accordingly. For those of you who claim to have less than before for your computer, look at each magazine's content and you'll find that any machine's specific articles, combined with "general" articles — those written with each machine we support in mind — provide more than could ever have fit in the smaller editions and you also get the programs and articles written for other computers, documented to the extent that converting them is a real possibility.

The last complaint has been specifically from Apple readers who've seen the listings go from blurry to large and clean, to smaller but still clean. Our S-80 readers will agree that we've occasionally had very poor results from the printer with which we made our listings. In the July Apple edition we experimented with a letter quality Spinwriter. Unfortunately, because of the size, we were faced with the distinct possibility of cutting down the amount of software we could offer to make room for the larger listings. We tried shrinking them slightly, but they reduced both vertically and horizontally, making them unreadable. Faced with the decision of less software, even if the old format magazine had been kept, we started experimenting with other printers again and came upon the Centronics 737 we now use. It's a high-density dot matrix printer that allows us to condense the print horizontally without reducing the vertical dimension. We've been pleased with the results, but of course we'll always be looking for better options.

We thank all of you for your feedback, positive or negative. You, our readers, have always been an uncommonly responsive group, as proven by the percentage of returns from past reader surveys. Your input is invaluable in shaping **SoftSide** and its future, and we do listen. We hope you'll help us to make **SoftSide** the best computer magazine avaiable.

Sincerely,

Roger Robitaille
George Blank
Mark Pelczarski
James Garon

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Special note to programmers:

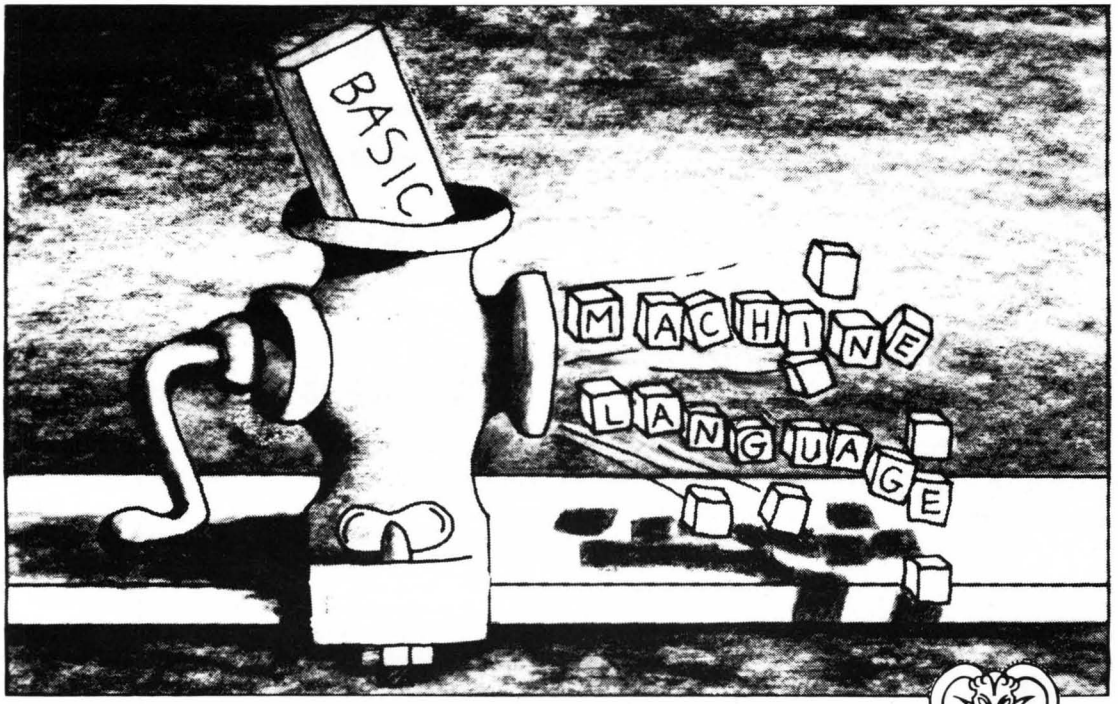
Please avoid the use of the letter "O" and the number "0" in variable names where they may cause some confusion. We don't use the slash-0 in our listings because it has caused more problems with "8"s than the regular zero does with the letter "O". Thank you.

Well, we did it again. Sorry this issue's late. As you can already see, we've gone to a new printer, and sometimes you just have to go by someone else's schedule. The next issue should be back on schedule. Hope you like the look.

This is the second anniversary issue of **SoftSide**. The first issue of **SoftSide** for the S-80 appeared in October, 1978. Since then we've published well over 100 first rate programs. We hope you'll continue to make **SoftSide** a success, and that you'll all help us bring new ideas to computing.

Finally, we'd like to welcome Scott Adams to our pages with his column, "Say YOHO."

The Lazy Man's Shortcut to Machine Language!



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*+ **November 1978** End Zone, Level I or Level II Conversion article, Trolls Gold, Shopping List, Octal to Hex.

*+ **December 1978** Santa Paravia, Biorhythms, Mortgage Calculation, Spelling Bee, Chess Clock.

January 1979 Round the Horn, Ten Pin, Bowling, Kiddy Slot, Computa Sketch, Writing Game Articles.

February 1979 Income Tax Program, Concentration, Elements Quiz.

March 1979 Tarot, Metric/English conversion, Jig Saw, Fog Index, Dive Bomb, Personal Finance Part 1.

April 1979 Safari, Personal Finance Part 2, Don't It Make My Brown Eyes Blue, Rabbits and Foxes, Spring Flowers.

May 1979 Dog Star Adventure, Awari, Letter Crunch, Math Drill, Super Sub.

June 1979 Atlantic Balloon Crossing, Nim, German Word Quiz, Appliance Record System, Entrapment.

July 1979 All Star Baseball, Yahtzee, Tank, Spelling Bee, Collision.

August 1979 Melt Down, Shooting Gallery, Story Book, Code Tutor, Cryptogram.

September 1979 Engineer, Treasure Dungeon, Hangman, Pyramids.

October 1979 Westward 1847, Battleship, Reaction Time Indicators, What Kind of Word?

December 1979 Oil Baron, Drag Race, Christmas Show and Tell, Index to Level II Manual, Towers of Hanoi, Slalom.

January 1980 Moving Maze, Dante's Inferno, Bomber, Reflection, Duck Hunter.

February 1980 Deadstick, Backgammon, Parachute, Play It Again Sam, Deep Six.

March 1980 Broadway, System Emulator, Line Four, Add, Sonic Torpedo.

May 1980 Star Trek III, Encounter in the Near Tholian Sector, Day of the Week.

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June 1980 MicroMillionaire, Galaxy Combat, Numbagels, Simple Sound Interface.

July 1980 Adventure Builder, Adventure Interpreter, Lost Dutchman's Gold, Pinball.

PROG/80

PROG/80 The magazine for serious Programmers of the S-80 Computers.

May 1979 Boomer Box, Clock Routines, Rescue, Scattergram/Correlatin, ROM Keyboard Routines, Super Graphics without Disk, Super Graphics Aid, SQUISH/BAS, INIT.

July 1979 Sound Subroutines, Machine Language Video, High Density Data Storage, Histograph and Basic Statistics, Talking Banko, Plot, Cassette Controller, TRS-80 Music.

September 1979 DOS, Kids Stuff, Disk BASIC, Renumber, Squish 2, Data and Time Routine.

December 1979 Pascal Review, Which Language?, Devices, Hex/Decimal Conversion, DIM Statements Variable Uniqueness, Computer Telephone Dialer, Preference Poll, Reviews of Model II, Macrotronics, M-80, and Exatron Stringy Floppy.

February 1980 The Source, Timesharing, Tool, Program Write Protection, NAME, SuperZap Review, Hex-Mem Monitor, High Speed String Handling, CTR-41 Modifications.

April 1980 Level II Keyboard Redefinition, Writing System Tapes, Voice Synthesizer Lab, BASIC File Utility, Devices (2), First Time on the Source, Forum 80, Repeatable Randomness, Zero Slash Killer, Proofread.

June 1980 All Purpose Print Routine, Z-80 Disassembler, Printer Terminal, Random Accessing Techniques, Form Letter, BASIC To Electric Pencil Conversion, New NEWDOS. Command-LOC(X), Branching Functions in APL80.

August 1980 FORTRAN Subroutines, TRS-80 Program Storage and Useful Corollaries, Splat-An Introduction to Tiny Comp, Program Portability, VARLIST.

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SOFTSIDE: APPLE EDITION

* + **January 1980** Dog Star Adventure, Reverse, Giant Clock, Trolls Gold, Loan Amortization.

* + **February 1980** Supernim, State Capitals, Elementary Math, Connection, Musical Scales Sort.

* + **March 1980** Care and Feeding of Integer HI-RES, Renumber and Merge, Acey-Deucey, Treasure Hunt, Bouncing Ball Catcher, Switch Puzzle.

* **April 1980** Applesoft Ampersand, Shootout, Jigsaw Puzzle, Space War, Melody, Display Control Characters.

* **May 1980** Invaders, Small Marquee, Magic Cave, Black Box, Fifteen game, Hyperboloid.

* **June 1980** Dogfight, HI-RES Drawing, Dodger, ROM the Robot, A Hello Program.

July 1980 Pork Barrel, NO MIS, ROM the Robot, LORES Printout, It's a Small World.

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September 1980 Goal (Apple), Stereo Generator (Apple), Concentration II (S-80), Barricade (Atari), Dr. Livingston, In Search of (S-80), Foosball (Apple), Lone Star Corral (S-80), Sleuth (Atari), Ricochet (Atari).

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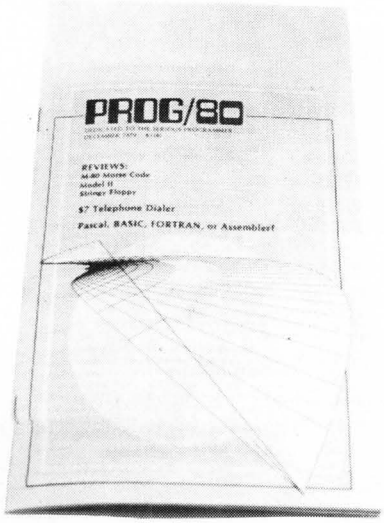

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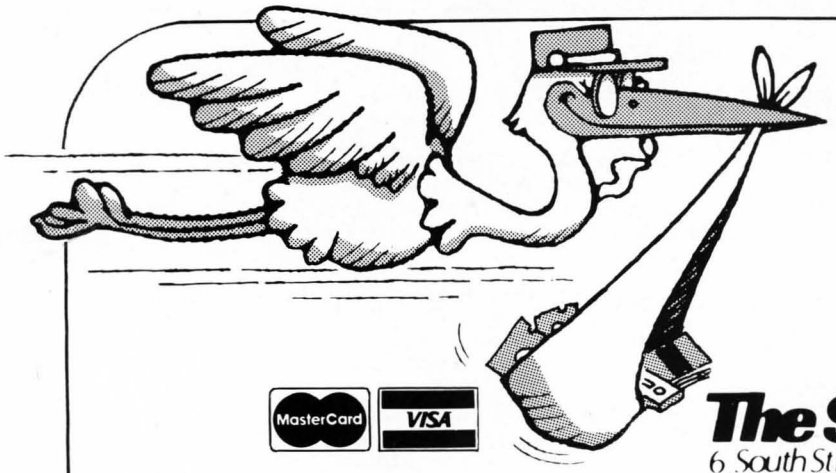

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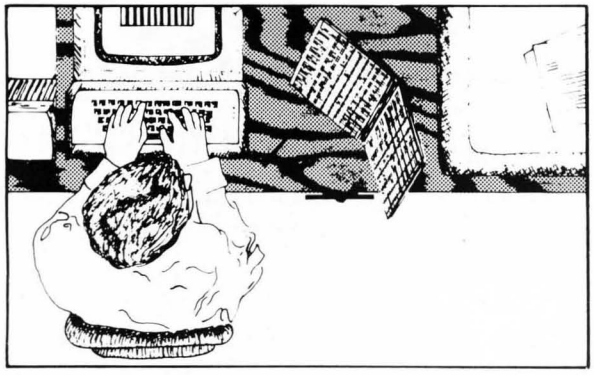

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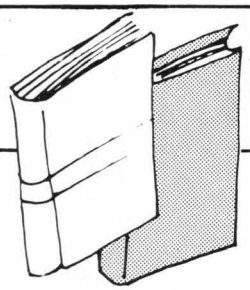

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CP/M SOFTWARE SUMMARY GUIDE

A concise, handy summary of the major software used on most CP/M systems. Included are summaries of the CP/M operating system, Microsoft BASIC, CBASIC™, and the CP/M utilties DESPOOL™, MAC™, and TEX.

The CP/M summary covers the commands (DIR, ERA, REN, SAVE, TYPE, USER) and utilities (ASM, DDT, DUMP, ED, LOAD, MOVCPM, PIP, STAT, SUBMIT, SYSGEN, XSUB). Each one is explained briefly and clearly with examples. The booklet also summarizes all features of Microsoft's BASIC-80 (including the compiler) and Compiler System's CBASIC. Error codes for CBASIC-1, CBASIC-2, and BASIC-E are also summarized in a single alphabetical list. Examples and definitions clearly explain the workings of DESPOOL, MAC, and TEX utilties offered by Digital Research.

The CP/M Software Summary Guide is designed to be especially easy to use. Features are organized alphabetically, so the reader can find an explanation quickly rather than having to page through various function sections.

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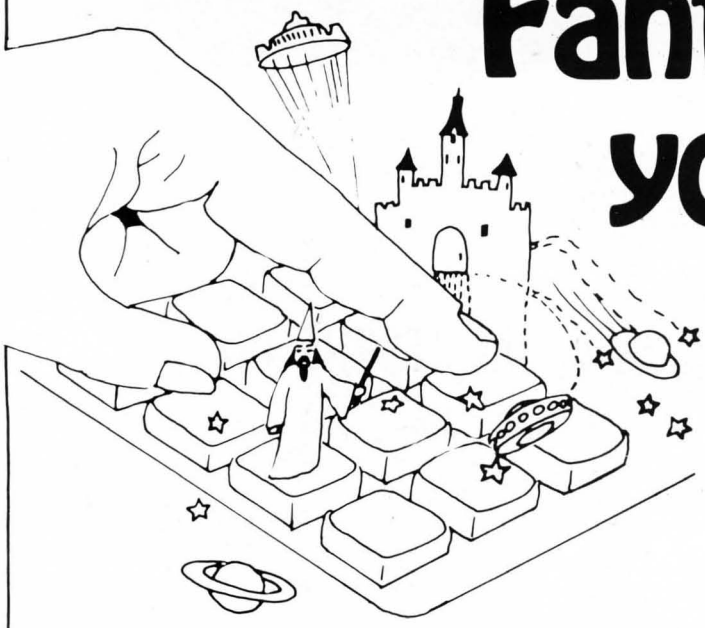

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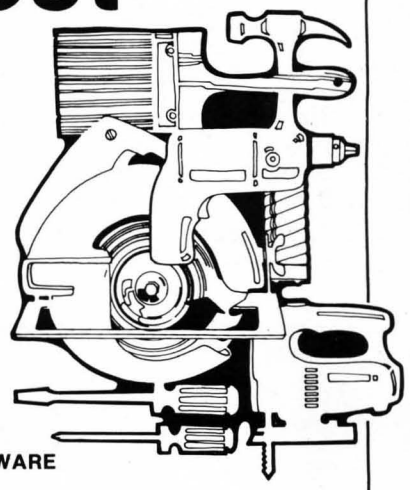

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B VALA VALB(0)	hex arithmetic
C	check system tape
D FIRST(0) LAST(FFFF)	dump hex
E FIRST(0)	edit memory
F FIRST LAST VALUE	find byte
G BRKPTS (3 max.)	set breakpoints, continue
H FIRST LAST VALUE	find word
I PORT	read port
K	keyboard echo
L	load system tape
L SECTOR MEMORY COUNT(1)	load from disk
M FIRST LAST BLOCK	move memory
N	display symbol table
N 0	symbol table to tape
N VALUE	define value for symbol table
N FIRST 0	define start symbol table
O PORT VALUE	write to port
P	initialize memory blocks
P ENTRY	write memory blocks and start
P FIRST LAST	define a memory block
Q FIRST LAST	calculate checksum
R	display / modify registers
S FIRST LAST OPTION(0)	disassembler
T COUNT OPTION(6)	trace instructions
U FIRST COUNT OPTION(0)	unformatted tape I/O
V FIRST LAST BLOCK	verify memory
W SECTOR MEMORY COUNT(1)	write to disk
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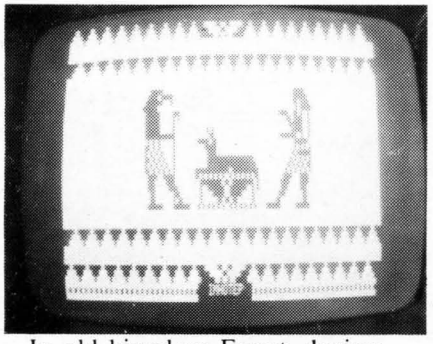
IMHOTEP

The S-80 version of IMHOTEP requires Level II and 16K. The Apple version requires Applesoft and 16K.

Apple translation by Michael Antonovich

by Terry Clark



In old kingdom Egypt, during the reign of Zoser, there lived a wise man named Imhotep. Zoser desired that a great monument be built so that the Gods of Egypt would grant him eternal life. Imhotep was renowned throughout Khem (as they called their country) as a man of great intellect. The discovery of medicine and science as they know it, and the relatively new techniques of architecture were attributed to him. Therefore, Zoser chose Imhotep to erect his monument. Upon the desert of the east the first pyramid was raised, the famous step pyramid at Saqqara. Though a long way from the perfection and sheer size of the later Great Pyramid, the step pyramid of Zoser is a good first try. Imhotep must have been a remarkable man, possibly even worthy of the godhood granted him by later generations of Egyptians. He was revered until the very end of the culture.

In this game I have tried to simulate the frustrations involved in the construction of a pyramid. The strain on the entire country must have been great indeed. From the hundreds of thousands of people involved, to the vast amounts of grain needed to feed them, all had to be coordinated. This task fell for the first time on the shoulders of Imhotep. He did not have the lessons of past failures to rely upon for guidance. He had to devise all the systems needed to perform this task. The fact that the pyramid was finished is, in itself, a testament to the intelligence of this man.

So this man, Imhotep, fulfilled the wishes of his lord and master, Zoser the Pharoah. The step pyramid has brought the memory of Zoser into the present day and made his name immortal. But also the name of Imhotep lives on. To this day no one has located his tomb. Somewhere it may still exist, waiting, as did the tomb of Tut-ankh-amen, for the light to re-enter its now-darkened confines and illuminate the many wonders surely entombed with the great master mason Imhotep.

List of variables used in Imhotep (both versions)

A$ - used in INPUT statements to advance the game.

B - the number of tels (of land) to be planted.

B$ - current overseer's name.

D - the number of tels flooded by the Nile.

E$ - stores the top and bottom border design (S-80 only).

E - used in the graphics of the Pyramid as the starting point of each course.

ER - stores the number of mistakes the player has made.

F - the end-point of each course in the Pyramid graphics.

G - FOR/NEXT loop in the pyramid graphics.

G$ - contains a string of three pyramids as used in the border. (S-80 only)

H - the number of lines PRINTed on the screen. Used to avoid scrolling in the case of an eventful year.

I - the number of storehouses alloted to feed the work force.

IM$ - the name and honorifics of IMHOTEP.

J - the number of storehouses to feed the general population.

K - the random harvest.

L - the number of people fed in the general population.

M - the number of people fed on the work force.

N - the number of courses completed on the Pyramid.

O - the number of storehouses either claimed or given by the priests.

P - the total population of Egypt.

Q - random chance of plague, tribute or Zoser's campaign.

R - increase in population for each year.

S - total number of storehouses.

T - time in years.

U - random chance of rebellion by the work force.

U1 - temporary counter of those killed in rebellion (Apple only).

V - the amount of tribute from Nubia.

V1 - temporary counter of population killed due to various causes.

V$ - used in line # 660 to call a new game.

W - the number of people in the work force.

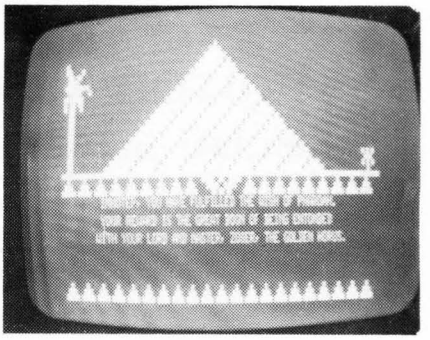
WA - the chance of war, invasion, Minoans, rebellion and a bride for Pharoah.

X - loop in Pyramid graphics used to draw each course of stone. (S-80 only)

Y - level of each course in Pyramid graphics.

Z - chance of collapse.

ZZ - timing loop on "NEW GAME" input at end of game. (S-80 only).



APPLE VERSION

Title and Copyright

```
10  REM  IMHOTEP - PYRAMID BUILDE
    R * VERSION 2.5
20  REM  COPYRIGHT (C) 1980 TERRY
     CLARK COLUMBUS IN
```

Clear space, set graphic mode, and draw introductory picture.

```
30  TEXT : HOME : GR : GOSUB 1200
    :NN = 0
```

Initialize the contents of some variables.

```
50  READ B$:P = 300000:D = 2500:S
    = 330:T = 0:W = 0:ER = 0:N =
    0:IM$ = "IMHOTEP"
```

Clear screen and print introductory pages.

```
60  TEXT : HOME : GOSUB 61: GOTO
    70
61  PRINT  TAB( 20)"*": PRINT  TAB(
    19)"***": PRINT  TAB( 18)"**
    ***": PRINT  TAB( 17)"*******
    *": PRINT  TAB( 16)"*********
    *": PRINT : PRINT : RETURN
70  PRINT  TAB( 17)"IMHOTEP": PRINT
     TAB( 13)"PYRAMID BUILDER": PRINT
    : PRINT
75  PRINT "WRITTEN BY: TERRY CLAR
    K": PRINT "TRANSLATED TO APP
    LE BY: M.P. ANTONOVICH": PRINT
    : PRINT : GOSUB 61
80  FOR I2 = 1 TO 5000: NEXT I2: HOME

85  PRINT "++++A DECREE FROM ZOSE
    R,": PRINT "    THE GOLDEN H
    ORUS,": PRINT "    BULL OF K
    HEM.++++"
90  PRINT : PRINT "TO IMHOTEP, MA
    STER MASON:"
100 PRINT "IMHOTEP, THE PHAROAH
    HAS COMMANDED A","PYRAMID TO
     BE BUILT.  THE HORUS DESIRE
    S","THIS GLORY TO HIS NAME T
    O BE FINISHED","WITHIN A PER
    IOD OF TWELVE YEARS."
130 PRINT "YOUR OVERSEER IS ";B$
    : PRINT "HE IS TO OBEY YOUR
    COMMANDS.": PRINT : PRINT
140 PRINT "HIT ANY KEY TO CONTIN
    UE ";: GET A$
```

Jump to the pyramid drawing routine for an initial pyramid.

```
141 HOME
142 IF T = 0 THEN 163
145 GOSUB 690
```

A report on the current state of affairs is printed under a separate page.

```
150 VTAB 21: PRINT "WORK SITE AF
    TER ";T;" YEARS."
161 GOSUB 162: GOTO 163
162 FOR I1 = 1 TO 5000: NEXT I1:
     RETURN
163 TEXT : HOME
164 PRINT "POPULATION OF KHEMI -
    "; INT (P)
165 PRINT "PHAROAH OWNS "; INT (
    S);" GRAIN STOREHOUSES.": PRINT
    "NILE FLOODED "; INT (D);" T
    ELS OF LAND."
180 PRINT : PRINT "# OF PEOPLE Y
    OU WISH ON WORK FORCE": INPUT
    W
190 IF (W > P) OR (W < 0) THEN 7
    80
200 PRINT : PRINT "FROM "; INT (
    S);" STOREHOUSES OWNED BY RA
    ,"
210 INPUT "HOW MANY WILL FEED WO
    RKERS ";I
220 IF (I > S) OR (I < 0) THEN 8
    10
230 P = P - W:S = S - I
```

The desired actions are input and checked for legality.

```
250 PRINT : PRINT "FROM "; INT (
    S);" REMAINING STOREHOUSES,"

260 PRINT "HOW MANY WILL FEED ";
     INT (P): INPUT "REMAINING P
    EOPLE ";J
270 IF (J > S) OR (J < 0) THEN 8
    20
280 S = S - J
290 PRINT : PRINT "FROM "; INT (
    D);" TELS, HOW MANY DO YOU"
300 INPUT "WISH TO PLANT ";B
320 IF B > D OR B < 0 THEN 840
330 IF B > S * 100 THEN 870
340 IF B > P * 10 THEN 880
```

Screen is cleared.

```
350 TEXT : HOME :H = 0: GOSUB 61
```

The storehouses allotted to the workforce are used to determine the number of people fed, at the ratio of one storehouse to 1000 people. If fed too much, the number fed is the same as the total number of workers.

```
360 M = I * 1000: IF M - W > 0 THEN
    M = W
```

The same is done for the remainder of the population. O is used to determine how many people will move here, based on the quality of chow in Egypt.

```
370 L = J * 1000:R = L - P: IF R <
    0 THEN R = 0
380 R = R +  INT ( RND (1) * 1000
    )
385 IF P - L > 0 THEN  PRINT "YO
    U HAVE STARVED ";P - L;" PEO
    PLE.":ER = ER + 1
386 IF L - P > 0 THEN L = P
```

If you starve too many people, Zoser will get you.

```
390 IF P - L > P * .45 THEN 900
```

Various random elements are determined here. The harvest and the number of storehouses gained, the chance of war, plague, and other catastrophic events are decided and the program jumps to the appropriate subroutines. Time is advanced in line 470.

```
400 U =  INT ( RND (1) * 40): IF
    U < 4 THEN 1050
401 IF (M - W) < 0 THEN  PRINT "
    YOU HAVE STARVED ";W - M;" W
    ORKERS.":ER = ER + 2: GOTO 1
    050
410 Z =  INT ( RND (1) * 50): IF
    (Z < 9) AND (N > 4) THEN 113
    0
420 K =  RND (1) * 3.5:S = S - (B
     / 100)
430 IF N > T * 2 THEN ER = ER -
    1
440 IF ER >  = 0 THEN O =  INT (
    ((S * ( RND (1)) + (ER * 4))
     / 2)): IF O < 2 THEN S = S -
    O
450 IF ER < 0 THEN O =  INT (S *
    ( RND (1)) / 10):S = S + O
460 IF S < 0 THEN S = 0
470 S = S + ((B * K) / 10):T = T +
    1
480 D =  INT ( RND (1) * 4000 + (
    O * .5)):Q =  RND (1) * 30: IF
    Q > 22 THEN 950
481 IF (Q > 12) AND (Q < 18) THEN
    1010
482 IF Q < 8 THEN 920
490 WA =  RND (1) * 300: IF WA <
    19 THEN  GOSUB 940
```

```
491  IF WA > 282 THEN  GOSUB 1040
492  IF (WA < 210) AND (WA > 165)
      THEN  GOSUB 960
493  IF (WA > 75) AND (WA < 130) THEN
      GOSUB 1020
494  IF (WA > 255) AND (WA < 260)
      THEN  GOSUB 1030
```

The report of the year's progress is displayed, along with a statement on the mood of the Pharoah, if needed.

```
510  PRINT "THE HARVEST THIS YEAR
      WAS ";K / 10: PRINT "    ST
     OREHOUSES PER TEL."
520  IF ER >  = 0 THEN 530
521  IF (ER < 0) AND (O > 1) THEN
      PRINT "THE PRIESTS OF AMEN
     GAVE ZOSER,";O: PRINT "    S
     TOREHOUSES OF GRAIN.":H = H +
     1: GOTO 540
530  IF O < 2 THEN  GOTO 540
531  IF ER >  = 0 THEN  PRINT O;"
      STOREHOUSES OF GRAIN WERE C
     LAIMED": PRINT "    BY THE P
     RIESTS OF AMEN.":H = H + 1
540  PRINT "THE POPULATION INCREA
     SED BY ";R: PRINT "    PEOPL
     E."
550 P = R + L + M - U1 - V1
551 U1 = 0:V1 = 0
560 N =  INT (N + (W - (W - M)) /
     90000)
570  IF N > 20 THEN N = 20
580  IF (N < 21) AND (N > 0) THEN
      PRINT "THE WORK FORCE HAS C
     OMPLETED ";N: PRINT "COURSES
      OF THE PYRAMID."
590  IF (N < 21) AND (D < 1000) AND
     (H < 10) THEN  PRINT "THE VI
     ZIERS PREDICT A POOR FLOOD N
     EXT","YEAR.":H = H + 2
591  IF (N < 21) AND (D > 3700) AND
     (H < 10) THEN  PRINT "THE ME
     LTING SNOW OF ETHIOP WELLS T
     HE","NILE THIS SPRING.":H =
     H + 2
600  IF (N < 10) AND (T > 6) OR (
     ER > 3) AND (N < 20) THEN  PRINT
     "PHAROAH IS BOTHERED BY YOUR
      INEFFICIENCY":H = H + 2
610  IF ER > 7 THEN  PRINT "HE HA
     S DECREED, THAT FOR YOUR MIS
     TAKES,","YOU WILL BE EXILED
     TO THE RED LAND OF","THE EAS
     T.": GOTO 660
620  IF H < 2 THEN  PRINT IM$;","
     : PRINT "AN UNEVENTFUL YEAR.
     "
```

```
621  IF (H > 8) AND (H < 14) THEN
      PRINT IM$;",": PRINT "A VER
     Y EVENTFUL YEAR."
624  PRINT "HIT ANY KEY TO CONTIN
     UE ";: GET A$
625  IF T = 6 THEN  GOSUB 1330
630  GOSUB 690
640  IF T >  = 12 THEN 890
650 S =  INT (S * 10 + .5) / 10:D
      =  INT (D * 10 + .5) / 10:P
      =  INT (P * 10 + .5) / 10: GOTO
     150
```

End of program.

```
660  PRINT "IMHOTEP WILL YOU TRY
     AGAIN? (Y/N) ";: GET V$
661  IF V$ = "Y" THEN  RUN
662  IF V$ = "N" THEN  TEXT : HOME
     : END
670  GOTO 660
```

This subroutine is used to redraw the initial picture, and then draw the pyramid, course by course.

```
690  HOME : GR : GOSUB 1200: COLOR=
     13:E = 0:F = 39:Y = 39
691  IF N = 0 THEN  RETURN
692  IF NN > 0 THEN  FOR G = 1 TO
     NN: HLIN E,F AT Y:E = E + 1:
     F = F - 1:Y = Y - 1: NEXT G
693  FOR G = NN + 1 TO N: FOR EE =
     E TO F
694  PLOT EE,Y:SD =  PEEK ( - 163
     36) +  PEEK ( - 16336): FOR
     PA = 1 TO 50: NEXT PA: NEXT
     EE
695 E = E + 1:F = F - 1:Y = Y - 1
     : NEXT G
696 NN = N
750  IF N = 20 THEN 970
760  RETURN
```

Here are the punishments for your errors, which are kept track of in the variable 0. 0 is used here to keep the screen from being filled to the point of over scrolling.

```
780  PRINT IM$;",": PRINT "ZOSER
     HEARD YOUR FOOLISHNESS.": PRINT
     "HE HAS EXILED ";B$;".":ER =
     ER + 1
790  ONERR  GOTO 1190
800  READ B$: PRINT B$;" HAS BEEN
      ASSIGNED AS OVERSEER.": PRINT
     "NOW...": GOTO 180
```

```
810  PRINT IM$;",": PRINT "DO NOT
      JEST,": PRINT "THE HAWK'S E
     ARS ARE SHARP.":ER = ER + 1:
      GOTO 200
820  PRINT IM$;",": PRINT "I, ";B
     $;", WARN YOU NOT":ER = ER +
     1
830  PRINT "TO MOCK PHAROAH ZOSER
     , HIS FLAIL IS","SWIFT.": GOTO
     250
840  PRINT IM$;",": PRINT "PHAROA
     H HAS KILLED ";B$: PRINT "YO
     UR OVERSEER.":ER = ER + 1
850  ONERR  GOTO 1190
860  READ B$: PRINT "I AM ";B$;"
     YOUR NEW OVERSEER.": PRINT "
     NOW...": GOTO 290
870  PRINT "THERE IS ONLY ENOUGH
     GRAIN TO PLANT ";S * 100 - 1
     : PRINT "TELS.":ER = ER + 1:
      IF S * 100 - 1 < 0 THEN 901
```

```
871  GOTO 290
880  PRINT "THERE ARE ONLY ENOUGH
      PEOPLETO PLANT": PRINT P *
     10;"TELS.":ER = ER + 1: GOTO
     290
890  PRINT "YOU HAVE RUN OUT OF T
     IME, ZOSER WANTS","YOUR HEAD
     .": GOTO 660
900  REM  YOU KILLED TOO MANY PEO
     PLE
901  PRINT "ZOSER WANTS YOU MUMIF
     IED ALIVE IN THE ","HOUSE OF
      THE DEAD.": GOTO 660
920 Q =  RND (1) * (P / 2) * 5:Q =
      INT (Q + .5): PRINT "A PEST
     ILENCE DESCENDED FROM AMEN-R
     E.":H = H + 1
930  PRINT Q;" PEOPLE DIED.":V1 =
     Q: GOTO 510
940 Q =  INT ( RND (1) * P): PRINT
     "HYKSOS WITH CHARIOTS AND BL
     ADES OF","BLACK EVIL METAL H
     AVE ATTACKED KHEM.",Q;" PEOP
     LE HAVE BEEN KILLED.":V1 = Q
     :H = H + 3: RETURN
950 V =  INT ( RND (1) * 50): PRINT
     "NUBIAN EMISSARIES HAVE BROU
     GHT TRIBUTE","OF ";V;" STORE
     HOUSES OF GRAIN.":S = S + V:
     H = H + 2: GOTO 510
960 Q =  INT ( RND (1) * P): PRINT
     "ACHEAN BARBARIANS FROM THE
     NORTHERN SEA","HAVE RAIDED T
     HE DELTA ";Q: PRINT "PEOPLE
     HAVE BEEN KILLED.":V1 = Q:H =
     H + 3: RETURN
970 I2 = 2000
```

```
980  PRINT "IMHOTEP, YOU HAVE FUL
     FILLED THE WISH": FOR I1 = 1
      TO I2: NEXT I1
981  PRINT "OF PHAROAH.  YOUR REW
     ARD IS THE GREAT": FOR I1 =
     1 TO I2: NEXT I1
982  PRINT "BOON OF BEING ENTOMBE
     D WITH YOUR LORD": FOR I1 =
     1 TO I2: NEXT I1
983  PRINT "AND MASTER, ZOSER, TH
     E GOLDEN HORUS.": FOR I1 = 1
      TO I2: NEXT I1: GOTO 660
1010 V =  INT ( RND (1) * 50): PRINT
     "A MILITARY CAMPAIGN LED BY
     ZOSER HAS","BROUGHT AN ADDIT
     IONAL ";V;" TELS": PRINT "OF
      LAND INTO THE DOUBLE-KINGDO
     M.":D = D + V:H = H + 3: GOTO
     510
1020 V =  INT ( RND (1) * 50 + 20
     ): PRINT "MINOAN MERCHANTS H
     AVE BROUGHT ";V: PRINT "STOR
     EHOUSES OF GRAIN TO TRADE FO
     R": PRINT "METHODS OF BUILDI
     NG AS PRACTICED IN","KHEMI."
     :S = S + V:H = H + 4: RETURN
1030 V =  INT ( RND (1) * 100): PRINT
     "THE PHAROAH'S NEW SYRIAN BR
     IDE BROUGHT","A DOWRY OF ";V
     ;" STOREHOUSES": PRINT "OF G
     RAIN.":S = S + V:H = H + 3: RETURN
1040 V =  INT ( RND (1) * W):V1 =
     V:W = W - V: PRINT "A FANATI
     CAL REBEL-PRIEST HAS ESCAPED
     ","WITH ";V;" WORKERS INTO T
     HE": PRINT "WILDERNESS OF TH
     E SINAI.":H = H + 3: RETURN
1050  IF W = 0 THEN  RETURN
1060 U =  INT ( RND (1) * 100): PRINT
     "THE WORK FORCE HAS REVELLED
     .  ";U
1070  PRINT "WORKERS, AND ";B$;",
      THE OVERSEER,": PRINT "WERE
      KILLED BY"
1080  PRINT "PHAROAHS'S VICTORIOU
     S ANUBIS SQUADRON."
1090 U1 = U:W = W - U
1100  ONERR  GOTO 1190
1110  READ B$: PRINT "THE GREAT Z
     OSER HAS CHOSEN ";B$: PRINT
     "TO BE YOUR NEW OVERSEER.":H
      = H + 6: GOTO 420
1130 Z =  INT ( RND (1) * 2 + 2):
     N = N - Z:W = W -  INT (W *
     .25):M = W + P: IF NN > N THEN
     NN = N
1140  PRINT Z;" COURSES OF THE PY
     RAMID HAVE": PRINT "COLLAPSE
     D AND ONE-FOURTH OF THE WORK
     ","FOURCE WAS LOST.":H = H +
     3: GOTO 420
1160 N = 20: GOTO 690
Here are the overseers.
1180  DATA  "MENE-PTAH","RA-ANX-T
     ETA","ATUM-ATON","SETEP-EN-R
     E","RAMOSE","MERI-ATUM","KA-
     RES","MAATTUM","MERI-TEHU"
1181  DATA  "TOTHMES","RE-MES-SES
     ","PTAHMES","MERIPASHTU"
Store the picture for the
introduction and annual picture.
1200  COLOR= 9: HLIN 4,8 AT 1: HLIN
     8,12 AT 2: PLOT 12,3: HLIN 7
     ,8 AT 3
1202  VLIN 2,9 AT 6: VLIN 5,9 AT
     7: VLIN 2,9 AT 5: VLIN 2,9 AT
     4: VLIN 2,9 AT 3: VLIN 3,9 AT
     2: PLOT 1,4
1203  HLIN 8,12 AT 9: HLIN 4,5 AT
     19: HLIN 4,5 AT 20: HLIN 15,
     16 AT 20: HLIN 14,15 AT 19: HLIN
     3,8 AT 21: HLIN 14,19 AT 21
1204  COLOR= 1: HLIN 13,15 AT 5: PLOT
     15,6: VLIN 5,21 AT 13: VLIN
     11,15 AT 2: VLIN 11,15 AT 39
1205  FOR ZP = 1 TO 6: PLOT 5 + Z
     P,9 + ZP: PLOT 3 + ZP,9 + ZP
     : NEXT ZP: PLOT 8,10
1206  FOR YP = 1 TO 3: FOR ZP = 1
      TO YP * 2 - 1: PLOT 2 + ZP,
     16 + ZP - YP * 2: NEXT ZP,YP
1207  COLOR= 3: HLIN 3,6 AT 16: HLIN
     3,5 AT 17: HLIN 3,5 AT 18: HLIN
     8,13 AT 16: HLIN 10,13 AT 17
     : HLIN 11,14 AT 18
1210  HLIN 28,31 AT 16: HLIN 27,3
     0 AT 17: HLIN 27,29 AT 18: HLIN
     35,38 AT 16: HLIN 35,38 AT 1
     7: HLIN 35,37 AT 18
1211  COLOR= 9: HLIN 33,37 AT 1: HLIN
     33,38 AT 2: HLIN 33,34 AT 3:
      HLIN 36,39 AT 3: HLIN 36,39
      AT 4: HLIN 23,26 AT 21: HLIN
     33,38 AT 21
1212  VLIN 5,9 AT 38: VLIN 5,9 AT
     33: VLIN 4,8 AT 34: VLIN 6,8
      AT 35: VLIN 7,9 AT 36: HLIN
     27,33 AT 9: PLOT 32,8
1213  HLIN 27,30 AT 5: HLIN 30,31
      AT 6: HLIN 31,32 AT 6: HLIN
     26,28 AT 19: HLIN 25,26 AT 2
     0: HLIN 36,37 AT 19: HLIN 36
     ,37 AT 20
1214  COLOR= 1: FOR XP = 1 TO 6: PLOT
     35 - XP,9 + XP: PLOT 37 - XP
     ,9 + XP: PLOT 39 - XP,9 + XP
     : NEXT XP
1215  FOR XP = 1 TO 4: PLOT 39 -
     XP,11 + XP: NEXT XP: PLOT 38
     ,14: PLOT 37,15
1220  VTAB 21: PRINT  TAB( 16)"IM
     HOTEP"
1225  IF TZ = 1 THEN  RETURN
1230  FOR ZZ = 0 TO 5000: NEXT ZZ
     :TZ = 1: RETURN
```

It is jubilee time. Here Pharoah uses the number of mistakes made (ER), the degree of completion (N), the number of storehouses (S), and the number of people (P) to rate the ability of Imhotep. If rewarded, Imhotep has his mistakes erased from his record, which, by the way, will get the priests off his back.

```
1330  TEXT : HOME : GOSUB 61: PRINT
      TAB( 16)"JUBILEE": PRINT "I
     T IS TIME FOR PHAROAH'S JUBI
     LEE.","YOU HAVE USED HALF OF
      YOUR TIME."
1340  IF (N = 20) OR ((N > 10) AND
     (P > 300000) AND (S * 1000 >
     P) AND (ER < 2)) THEN  PRINT
     IM$: PRINT "PHAROAH IS PLEAS
     ED WITH YOUR": PRINT "PERFOR
     MANCE SO FAR AND BESTOWS A G
     REAT","HONOR ON YOU, FROM TH
     IS MOMENT YOU ARE","KNOWN AS
      'GREAT LORD IMHOTEP'.
1345  IF (N = 20) OR ((N > 10) AND
     (P > 300000) AND (S * 1000 >
     P) AND (ER < 2)) THEN ER =  -
     1:IM$ = "GREAT LORD IMHOTEP"
     : GOTO 1370
1350  IF (N < 7) AND (ER > 3) AND
     (P < 300000) AND (S * 1000 <
      = P + 50) THEN  PRINT IM$: PRINT
     "PHAROAH IS DISPLEASED WITH
     YOU AND","DESIRES FOR YOU TO
      SUFFER THE DISHONOR","OF BE
     ARING THE TITLE 'IMHOTEP THE
     ","INCOMPETENT'."
1355  IF (N < 7) AND (ER > 3) AND
     (P < 300000) AND (S * 1000 <
      = P + 50) THEN ER = ER + 1:
     IM$ = "IMHOTEP THE INCOMPETE
     NT": GOTO 1370
1360  PRINT IM$: PRINT "PHAROAH F
     EELS YOU HAVE NOT PUT FORTH
     A","GOOD EFFORT AND DISIRES
     TO REMIND YOU","OF YOUR RESP
     ONSIBILITIES WITH THE","TITL
     E 'IMHOTEP-HORUS-WATCHES'.":
     IM$ = "IMHOTEP-HORUS-WATCHES
     "
1370  PRINT "HIT ANY KEY TO CONTI
     NUE ";: GET A$: RETURN
```

continued on page 82

SOFTSIDE DATABASE PART 2

by Mark Pelczarski

S-80 translation by James Garon.
Atari translation by Rich Bouchard.

Last month, in the first part of this series, we finished with a program that would allow you to create a data file and add, print, save, and retrieve information. This month we'll make some additions to the program that will let you correct any mistakes you made in entering your data, plus make revisions to your data file. This will be accomplished with two new subroutines, Change and Delete.

First, to identify the parts of the program and to clarify any updates, you may want to include the following remark statements in your copy. The subroutines labeled version 2 result from changes that will be made this month:

```
999  REM  LOAD SUBROUTINE VERS.1
1499  REM  INITIALIZE SUBROUTINE
     VERS.1
1999  REM WRITE SUBROUTINE VERS.1
2999  REM PRINT SUBROUTINE VERS.2
3999  REM ADD SUBROUTINE VERS.2
8999  REM ERROR SUBROUTINE #1
```

The first step to consider in adding the change and delete routines is how we are going to tell the computer which record we want to modify. In the near future we'll develop a way to reference records by name, part number, or information under a given heading; but for now we'll use the easier approach of simply numbering the records from 1 to however many there are. The new lines 3115 and 3435 for the print subroutines, and line 4005 for the add subroutine, print the record number as you are working. Remember that the records are actually numbered starting from zero, so in the lines just mentioned we add one before printing to give the appearance starting with records 1.

The changes to the main routine consist of adding the change and delete options to the list of choices in lines 240 and 250. Lines 350 and 360 handle the responses "C" or "D", and in addition we've slightly altered lines 320, 330, and 340 by adding GOTO 200 at the end of each. The latter was necessary because in some of the subroutines A$ may change, causing undesirable results if the subroutine returns to an IF statement that tests for a command. For example, if the subroutine changed A$ to a value of "Q", upon returning the program would think you wanted to quit.

The Change subroutine starts at line 5000. It first checks if there are any records in the file, and if not, gives the user the message that there is nothing to change. The user is then asked which record to change. One is subtracted from the response to adjust the offset, the response is checked for validity, and then at line 5020 the message "(C) change, or (K) keep" is displayed. Lines 5040 to 5090 contain a loop that will print each heading with the information given for that record, then wait for the user to respond with a "C" or "K". The "K" response simply tells the computer that the information should be kept and the computer loops back to the next heading. The "C" response allows the user to change that item by typing the new information.

A new switch, CS, is used in this subroutine. At the beginning of the loop it is set to one. If any changes are actually made (if the "C" choice is ever picked instead of "K"), CS is set to zero. (It is possible to enter the change subroutine and not make any changes.) If at the end of the subroutine CB is zero, meaning changes have been made, SS, the save switch, is also set to zero. SS is the switch we used last month that checks if you've saved your current file before it allows you to quit.

The Delete subroutines, at line 6000, starts the same as the change subroutine. It checks to see if there are any records and then asks the user for a record number, which it also verifies. From lines 6020 to 6050 it prints the information included in that record, then asks the user to verify that that information should be deleted. The deletion is accomplished by taking the following records and moving it up one, and shifting each record after that up to fill the gap. For example, if there are seven items and record 4 is deleted, record 5 is moved to the 4th position (becoming record 4), record 6 is moved to 5, and record 7 is moved to 6. Lines 6100 to 6130 accomplish this shift, with the variable I1 counting from the next record to the end of the file (In the example, it would count from 5 to 7). If a deletion actually occurred, line 6140 subtracts one from the number of records (NI), and sets the save switch to zero.

The information covered last month was quite extensive, starting from scratch and designing a data structure and a working program. If there are any questions concerning the program to this point, please feel free to write. We do intend to make this series somewhat conversational, and may occasionally include specific letters and responses. We hope that in the process of developing this data base we'll be able to cover a wide range of programming topics in the context of a program, so even if you already own a commercially produced data base system, you may want to follow along and pick up some programming tips. To give you an idea of future plans, next month we'll introduce a simple sorting routine, and in following months we will develop search routines, print formatting, selective printing, editor style alterations, use of upper/lower case (which the Atari already has), printer interfacing, conservation of space, plus several other upgrades that should give you both a good working program and a resource for programming techniques.

APPLE MODIFICATIONS

```
240  PRINT "(C) CHANGE A RECORD"
250  PRINT "(D) DELETE A RECORD"
320  IF A$ = "S" THEN  GOSUB 2000
     : GOTO 200
330  IF A$ = "P" THEN  GOSUB 3000
     : GOTO 200
```

```
340  IF A$ = "A" THEN  GOSUB 4000
     : GOTO 200
350  IF A$ = "C" THEN  GOSUB 5000
     : GOTO 200
360  IF A$ = "D" THEN  GOSUB 6000
     : GOTO 200
3115  PRINT "RECORD ";I + 1: PRINT
3435  PRINT "RECORD ";I + 1: PRINT

4005  PRINT : PRINT "RECORD ";NI +
     1: PRINT
4999  REM CHANGE SUBROUTINE VERS.
     1
5000  IF NI =  - 1 THEN  GOSUB 90
     00: RETURN
5005  INPUT "WHICH RECORD : ";I
5010 I = I - 1: IF I < 0 OR I > N
     I THEN 5005
5020  PRINT : PRINT "(C) CHANGE,
     OR (K) KEEP"
5030  PRINT : PRINT "RECORD ";I +
     1
5040 CS = 1: FOR J = 0 TO NH
5050  PRINT : PRINT H$(J);" : ";I
     $(I,J);"  ";
5060  GET A$: IF A$ < > "C" AND
     A$ < > "K" THEN 5060
5070  PRINT A$: IF A$ = "K" THEN
     5090
5080  PRINT H$(J);: INPUT " : ";I
     $(I,J)
5085 CS = 0
5090  NEXT J
5100  IF CS = 0 THEN SS = 0
5110  RETURN
5999  REM DELETE SUBROUTINE VERS.
     1
6000  IF NI =  - 1 THEN  GOSUB 90
     00: RETURN
6005  INPUT "WHICH RECORD : ";I
6010 I = I - 1: IF I < 0 OR I > N
     I THEN 6005
6020  PRINT : PRINT "RECORD ";I +
     1: PRINT
6030  FOR J = 0 TO NH
6040  PRINT H$(J);" : ";I$(I,J)
6050  NEXT J
6060  PRINT : PRINT "DELETE THIS
     RECORD? ";
6070  GET A$: IF A$ < > "Y" AND
     A$ < > "N" THEN 6070
6080  PRINT A$: IF A$ = "N" THEN
     6150
6100  FOR I1 = I + 1 TO NI
6110  FOR J = 0 TO NH
6120 I$(I1 - 1,J) = I$(I1,J)
6130  NEXT J: NEXT I1
6140 NI = NI - 1:SS = 0
6150  RETURN
```

ATARI MODIFICATIONS

```
200 RL=(NH+1)*IL:PRINT "(S) SAVE CURREN
T DATA"
240 PRINT "(C) CHANGE A RECORD"
250 PRINT "(D) DELETE A RECORD"
320 IF CHR$(A)="S" THEN GOSUB 2000:GOTO
200
330 IF CHR$(A)="P" THEN GOSUB 3000:GOTO
200
340 IF CHR$(A)="A" THEN GOSUB 4000:GOTO
200
350 IF CHR$(A)="C" THEN GOSUB 5000:GOTO
200
360 IF CHR$(A)="D" THEN GOSUB 6000:GOTO
200
3115 PRINT "RECORD ";I+1:PRINT
3435 LPRINT "RECORD ";I+1:LPRINT " "
4006 PRINT :PRINT "RECORD NUMBER ";NI+1:
PRINT
4999 REM CHANGE SUBROUTINE VERS. 1
5000 IF NI=-1 THEN GOSUB 9000:RETURN
5005 PRINT :PRINT "WHICH RECORD : ";:INP
UT I
5010 I=I-1:IF I<0 OR I>NI THEN 5005
5020 PRINT :PRINT "(C) CHANGE, OR (K) KE
EP"
5030 PRINT :PRINT "RECORD ";I+1
5040 CS=1:FOR J=0 TO NH
5050 PRINT :PRINT H$(J*HL+1,J*HL+HL);" :
 ";I$(I*RL+1+J*IL,I*RL+J*IL+IL)
5060 GET #2,A:IF CHR$(A)<>"C" AND CHR$(A
)<>"K" THEN 5060
5070 PRINT CHR$(A):IF CHR$(A)="K" THEN 5
090
5080 PRINT H$(J*HL+1,J*HL+HL);" : ";:INP
UT A$
5082 IF LEN(A$)>IL THEN PRINT "TOO LONG.
 MAXIMUM SIZE IS ";IL;". REENTER":GOTO 5
080
5083 IF LEN(A$)<IL THEN A$(LEN(A$)+1)="
":GOTO 5083
5084 I$(I*RL+1+J*IL,I*RL+J*HL+IL)=A$
5085 CS=0
5090 NEXT J
5100 IF CS=0 THEN SS=0
5110 RETURN
5999 REM DELETE SUBROUTINE VERS. 1
6000 IF NI=-1 THEN GOSUB 9000:RETURN
6005 PRINT :PRINT "WHICH RECORD : ";:INP
UT I
6010 I=I-1:IF I<0 OR I>NI THEN 6005
6020 PRINT :PRINT "RECORD ";I+1:PRINT
6030 FOR J=0 TO NH
6040 PRINT H$(J*HL+1,J*HL+HL);" : ";I$(I
*RL+1+J*IL,I*RL+J*IL+IL)
6050 NEXT J
6060 PRINT "DELETE THIS RECORD? ";
6070 GET #2,A:IF CHR$(A)<>"Y" AND CHR$(A
)<>"N" THEN 6070
6080 PRINT CHR$(A):IF CHR$(A)="N" THEN 6
150
6090 I$(I*RL+1)=I$(I*RL+1+NH*IL+IL)
6140 NI=NI-1:SS=0
6150 RETURN

ALSO DELETE LINE 3060
```

S-80 MODIFICATIONS

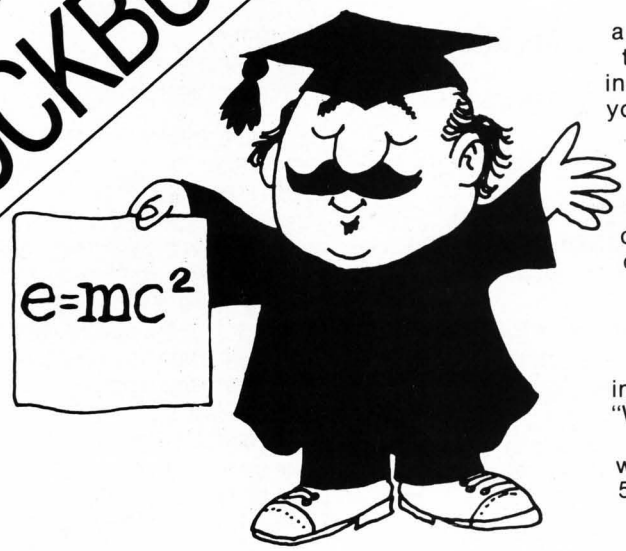
```
230 PRINT"(C) CHANGE A RECORD
240 PRINT"(D) DELETE A RECORD ?";
290 PRINT"(Q) QUIT ?";
310 IF A$ = "S" GOSUB 2000:GOTO 200
320 IF A$ = "P" GOSUB 3000:GOTO 200
330 IF A$ = "A" GOSUB 4000:GOTO 200
350 IF A$ = "C" GOSUB 5000:GOTO 200
360 IF A$ = "D" GOSUB 6000:GOTO 200
370 GOTO200
3010 PRINT"(S) SCREEN OR (P) PRINTER ?";:
     GOSUB 60000:PRINT

3115 PRINT"RECORD";I + 1:PRINT
3430 LPRINT" "
3435 LPRINT"RECORD";I + 1:LPRINT" "
4005 PRINT:PRINT"RECORD";NI + 1:PRINT
4999 REM CHANGE SUBROUTINE, VERSION 1
5000 IF NI = -1 GOSUB 9000:RETURN
5005 INPUT"WHICH RECORD";I
5010 I=I-1:IF I<0 OR I>NI THEN 5005
5020 PRINT:PRINT"(C) CHANGE, OR (K) KEEP"
5030 PRINT:PRINT"RECORD";I + 1
5040 CS=1:FOR J=0 TO NH
5050 PRINT:PRINT H$(J);" : ";I$(I,J);" ";
5060 GOSUB 60000:IF A$="K" THEN 5090
5070 IF A$<>"C" THEN 5060
5080 PRINT H$(J);:INPUT" : ";I$(I,J)
5085 CS=0
5090 NEXT J
5100 IF CS=0 THEN SS=0
5110 RETURN
5999 REM DELETE SUBROUTINE VERSION 1
6000 IF NI = -1 GOSUB 9000:RETURN
6005 INPUT"WHICH RECORD";I
6010 I=I-1:IF I<0 OR I>NI THEN 6005
6020 PRINT:PRINT"RECORD";I + 1:PRINT
6030 FOR J=0 TO NH
6040 PRINT H$(J);" : ";I$(I,J)
6050 NEXT J
6060 PRINT:PRINT"DELETE THIS RECORD ?";
6070 GOSUB 60000:IF A$="N" THEN 6150
6080 IF A$<>"Y" THEN 6070
6100 FOR I1=I + 1 TO NI
6110 FOR J=0 TO NH
6120 I$(I1-1,J)=I$(I1,J)
6130 NEXT J:NEXT I1
6140 NI=NI-1:SS=0
6150 RETURN
```

"I WAS A SUCCESSFUL EXECUTIVE THEN ONE DAY, FOR A JOKE, I MANGLED A COMPUTER CARD - NOW NO COMPUTER IN THE WORLD WILL DO BUSINESS WITH ME."

PERSONAL SOFTWARE

BLOCKBUSTERS!



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Garon's GOODIES

Those Neglected Space Compression Codes

Another in a continuing series of programming concepts for the S-80.

As most S-80 users know, the STRING$(X,Y) command is used to create a series of identical characters. X can be any number from 0 to 225; this value determines how many similar characters will be created. (Unless you specifically CLEAR more than the default amount of 50, you may encounter OS or OUT OF STRING SPACE errors if X is large.)

STRING$(X,Y) is one of the smartest BASIC functions, since it understands Y values which are either numeric or string, constants or variables. For example: While some beginning programmers use STRING$(X,CHR$(191)) to store a row of graphic characters, they eventually learn that STRING$(X,191) accomplishes the same task faster, with 3 fewer bytes of memory, and 6 fewer characters to type. Also, STRING$(50," "), for instance, is often replaced by STRING$(50,32) since 32 is the ASCII code for a space. One byte can always be saved by replacing a character in quotes by its 2-digit ASCII code. To determine this code for any letter or symbol, use the ASC function. If, for example, you want to create a string of minus signs (-) type ? ASC("-"), and out will pop 45. You can now use STRING$(X,45) instead of the easier to read but one byte longer STRING$(X,"-").

Of course one byte is not a high price to pay for clarity. Only a confirmed byte-miser (like myself) will be willing to go to the extra trouble for so small a savings. BUT . . .

A while back, we mentioned STRING$(50," ") and the equivalent STRING$(50,32). Did you know that CHR$(242) does exactly the same thing but with:

a) 5 fewer characters to type,

b) two fewer bytes of program memory,

c) faster execution speed, and - last but not least -

d) a whopping 49 fewer bytes of precious string space!?

Listing #1 shows the effect of printing the Space Compression Codes (SSCs) 192 through 255 on top of previously printed information. Press ENTER each time the display halts. To determine which SSC to use to obtain a given number of blanks, just add 192 to the desired number of blanks. Let's say you wish to have a 42 character message flash on and off by alternately printing (at the same screen location) the message and then the SSC for 42 blanks. Since 192 plus 42 is 234, the SSC CHR$(234) will do your erasing for you, will erase only the message, and will cost only one byte of string space!

Listing #2 lets you type in a message from 1 to 63 characters long. The program then calculates the required SSC and begins flashing your message. Notice that only the message is erased; the graphics immediately to the right are undisturbed.

I hear one of you out there with a flair for higher mathematics asking, "Since 63 and 192 add up to 255, and 255 is the largest number allowed in the CHR$ statement, is there any way to erase more than 63 characters and still enjoy the remarkable string storage savings of Space Compression Codes?"

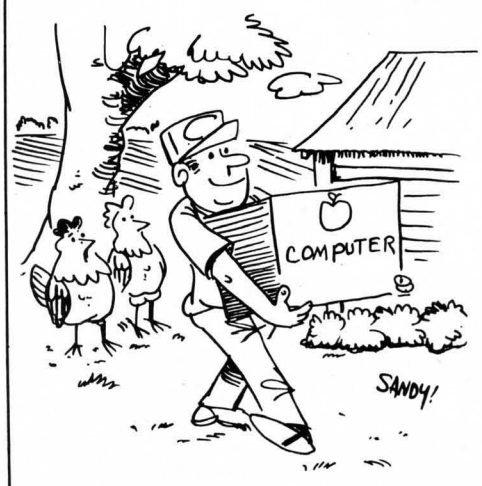
I'm glad you asked that question. The answer is a resounding "YES!" While STRING$(X,32) can erase only up to 255 characters, when STRING$ and the SSCs team up, the combination is truly awesome: STRING$(16,244), for instance, while consuming only 16 bytes of string storage, is secretly a string of 512 blanks, - enough to erase half the screen! For those of you who are fond of extremes, STRING$(255,255) is equivalent to 16,065 blanks; that's over 15 ½ full screens! "The human adventure is just beginning. . . "

LISTING #1

```
10 FORI=192TO255STEP16:GOSUB100:FORJ=0TO15
20 PRINTCHR$(I+J)CHR$(29);:IF I+J>196THENPRINTI+J;
30 PRINTCHR$(29)CHR$(26);:NEXT
60 IFINKEY$=""THEN60ELSENEXT
99 RUN
100 CLS:FORT=1TO33:PRINTSTRING$(31,143);:NEXT:POKE16383,143
110 PRINT@0,;:RETURN
```

LISTING #2:

```
100 CLEAR129:CLS:PRINT"MESSAGE (1-63 CHARS)":INPUTA$(1)
110 A$(2)=CHR$(192+LEN(A$(1))):CLS:PRINT"PRESS ENTER TO GO ON
120 A$(1)=A$(1)+STRING$(64-LEN(A$(1)),143):S=2
130 S=3-S:PRINT@ 512,A$(S);:FOR I=1 TO 50:NEXT
140 IFINKEY$=CHR$(13)THEN RUN ELSE 130
```



"I CAN TELL YOU ONE THING IT'LL NEVER DO-LAY EGGS!"

WORLD SERIES

WORLD SERIES is a 16K Atari program requiring two joysticks.

by David Bohlke

So you think the World Series is the end of the baseball season? Well it doesn't have to be if you've keyed WORLD SERIES into your Atari. This game will offer plenty of excitement during those sleepy winter (or TV football) days.

Both players will need quick reflexes and cool concentration to master this "favorite pastime" simulation. The player in the field has a variety of deliveries for each batter. There are eight pitch speeds to select from to confuse the hitter's timing. Once the pitch is delivered, the chucker can also control a curve left or right until the ball reaches the plate. With this combination of speed and curves, the batter will have to be on the edge of his seat to hit the pitch.

After a pitch is hit, the fielder will need to develop professional skills to actually "catch" the grounder or fly ball. He has options to dive left or right to snag balls just out of reach. And on fly balls, the fielder can jump to the top of the fence and snatch would-be home runs.

In addition to these real-time playing situations, there are also several computer generated random plays. These include double plays, sacrifice fly scoring, and fielding errors. At the end of each half-inning a scoreboard will display an inning by inning tally and a box score of hits, runs, errors, and hitting percentage.

Playing Instructions

To begin play, it is necessary to plug one joystick into slot #2, and another into slot #3. The stick on the left is the RED team, and will always be the visitor. Control of the hometown BLUE team is with the stick on the right.

In order to hit a pitch, the player at bat needs to push his joystick in any direction to take a cut at the ball. The best time to swing is when the ball is just in front of the plate. Of course, split-second reactions are needed for balls on the corner of the plate and/or curve balls.

The fielding player has many more responsibilities. First, he must deliver the pitch. This is done by pushing the joystick in any direction. Each of the eight stick positions corresponds to a different speed of pitch. Batters can often be fooled by just varying this speed. To make the ball curve, push your stick left (or right) while the ball is on the way to the plate. Your best pitches will curve just off the edge of the plate, forcing the hitter to swing at a pitch he cannot reach. Or, you can start the ball outside, and then have it curve over the plate. As in regulation play, four balls constitute a walk, and three strikes will be an out.

When the ball is hit, the fielding player must move his man left (or right) by pushing the stick left (or right) to "catch" the ball. In addition, if the ball seems to be just out of reach you can push the fire button while the player is moving left (or right) and your fielder will dive left (or right) and possibly catch balls which normally would have been hits. This dive play takes precise timing, and is meant as a last-ditch effort.

The outfielder also has the capability to jump straight up and catch balls. For example, on a long hit, move your fielder next to the fence, then press the fire button while the stick is in the neutral position and your player will jump a random distance straight up. Many games have been saved by the outfielder jumping above the home run fence and stealing a home run or long triple away from the batter. This technique can also work on line drives hit over your head.

After a few practice games, the hitting, pitching, and fielding should become second nature for most players. Your first few games might be high scoring affairs. But with two experienced players at the controls, the outcome of the game will usually depend on one key hit or perhaps one fielding error that starts a rally for the team at bat.

I believe this baseball simulation creates many of the tensions and pressures of the real game. And for sure there is the thrill of victory and the agony of defeat. If you have never taken the time to key in a magazine listing before, thinking that it wasn't worth your effort because it didn't cost $15, this program will convince you otherwise.

```
  Initialization. A$(7) holds BLUE/RED,
  S(18) contains score for 18 innings,
  N(47) holds music tones for tune in
  scorecard routine

5 REM  ALLSTAR BASEBALL
6 REM by  David Bohlke
80 DIM A$(7),S(18),N(47):IN=1:NT=1
82 FOR I=1 TO 18:S(I)=0:NEXT I

  DATA for music routine

90 FOR I=1 TO 47:READ X:N(I)=X:NEXT I
92 DATA 67,67,34,41,46,54,46,46,61,61,61

93 DATA 67,67,34,41,46,54,46,46,46,46,46
,46
94 DATA 41,41,41,54,51,46,41,41,51,61,61
,61
95 DATA 41,41,41,41,43,41,36,36,46,61,61
,61

  Main Game loop. B,R designate team at
  bat and in the field, OT is number of
  outs, J,K,L:runner on base indicators,
  ST:strikes, BL:balls, E errors, H:
  batter-reached-base flag, P:number of
  runs scored in each inning

100 IF B=2 THEN B=1:R=2:GOTO 120
103 DATA ter-reached-base flag  P:number
 of      runs scored in each inning
115 B=2:R=1
120 P=0:OT=0:J=0:K=0:L=0

  Set flags, branch to pitch, hit, field
  routines

200 ST=0:BL=0:P1=P:E=0:H=0:GOSUB 800

  Sound for runs scored

210 IF P>P1 THEN FOR II=1 TO P-P1:FOR I=
1 TO 100:SOUND 0,140-I,14,12:NEXT I:NEXT
 II

  Add one to count if runner doesn't
  reach base

230 IF H=0 THEN OT=OT+1
240 IF B=2 THEN 250
```

```
  Save Blue's hits and errors

242 IF HK>9 THEN BA=BA+1
244 IF H>0 AND HK<5 THEN BH=BH+1
246 IF E=1 THEN RE=RE+1:BH=BH-1
248 GOTO 290

  Save Red's hits and errors

250 IF HK>9 THEN RA=RA+1
252 IF H>0 AND HK<5 THEN RH=RH+1
254 IF E=1 THEN BE=BE+1:RH=RH-1

  Get another pitch if less than three
  outs

290 IF OT<3 THEN 200

  else save runs scored

300 S(IN)=P

  Display scoreboard

400 GRAPHICS 0:SETCOLOR 2,1,4:SETCOLOR 4
,8,10:POKE 752,1
405 ? :? "          ALLSTAR BASEBALL ":?
 :?
410 PRINT "INNING";? :? :? " RED ";? :?
" BLUE  "
415 FOR I=1 TO 9:POSITION I%3+9,4:PRINT
I;:NEXT I
420 BS=0:RS=0:FOR I=1 TO IN
422 IF I/2=INT(I/2) THEN 430
424 RS=RS+S(I):POSITION (I/2)%3+10,7
426 PRINT S(I);:GOTO 440
430 BS=BS+S(I):POSITION (I/2)%3+9,9
432 PRINT S(I);
440 NEXT I
450 POSITION 1,14:PRINT "Boxscore:  Runs
  Hits  Errors  Hit %";
452 POSITION 2,16:PRINT " Red ":POSITION
 2,18:PRINT " Blue "
460 POSITION 13,16:PRINT RS:POSITION 19,
16:PRINT RH:POSITION 26,16:PRINT RE
462 PE=INT(RH/RA%1000):POSITION 33,16:PR
INT PE
464 POSITION 13,18:PRINT BS:POSITION 19,
18:PRINT BH:POSITION 26,18:PRINT BE
466 IF BA=0 THEN 479
468 PE=INT(BH/BA%1000):POSITION 33,18:PR
INT PE
479 POSITION 0,23:PRINT "Press  Fire  to
 continue . . . ";
480 IF STRIG(1)=0 OR STRIG(2)=0 THEN GOT
O 485
482 GOSUB 950:GOTO 480
485 SOUND 1,0,0,0:IN=IN+1
486 IF IN=19 THEN 491
487 IF IN=18 AND BS>RS THEN 491
490 GOTO 100

  Prompt to begin next game

491 FOR I=1 TO 100:NEXT I:POSITION 0,23:
PRINT "    Press  FIRE  for next game ?"
;
492 IF STRIG(1)=0 OR STRIG(2)=0 THEN RUN

493 GOSUB 950:GOTO 492

  Advance runners on base, J,K,L equal
  zero if no runner on 1st, 2nd, or
  3rd else they equal one if base is oc-
  cupied

600 IF HK<1 OR H>4 THEN RETURN
602 FOR I=1 TO H%2:SETCOLOR 4,RND(0)%16,
12
603 SOUND 0,100,8,10:FOR II=1 TO 100:NEX
T II:NEXT I
606 GOTO H%10+600

  Advance runners if single (or error)

610 IF L=1 THEN L=0:P=P+1
612 IF K=1 THEN K=0:L=1
614 IF J=1 THEN K=1
616 J=1:RETURN

  Advance runners if double

620 IF L=1 THEN L=0:P=P+1
622 IF K=1 THEN P=P+1
624 IF J=1 THEN J=0:L=1
626 K=1:RETURN

  Advance runners if triple

630 IF L=1 THEN P=P+1
632 IF K=1 THEN P=P+1:K=0
634 IF J=1 THEN P=P+1:J=0
636 L=1:RETURN

  Advance runners if home run

640 IF J=1 THEN J=0:P=P+1
642 IF K=1 THEN K=0:P=P+1
644 IF L=1 THEN L=0:P=P+1
646 P=P+1:RETURN

  Advance runners on walk

650 FOR I=1 TO 200:NEXT I
651 IF J=0 THEN J=1:RETURN
652 IF K=0 THEN K=1:RETURN
654 IF L=0 THEN L=1:RETURN
656 P=P+1:RETURN

  Special situation plays:

  Ground out

660 PRINT " OUT ":SETCOLOR 4,6,12:SOUND
0,100,6,8:FOR I=1 TO 200:NEXT I
661 IF J=0 OR OT>1 OR RND(0)<0.5 THEN RE
TURN

  Double play

662 PRINT " DOUBLE PLAY !!! ":SOUND 0,20
0,10,8:FOR I=1 TO 250:NEXT I
664 IF OT=0 THEN 670
666 OT=OT+1:RETURN
670 OT=OT+1:IF K=1 AND L=0 THEN K=0:J=1:
RETURN
672 IF L=0 AND K=0 THEN J=0:RETURN
674 IF L=1 AND K=0 THEN P=P+1:J=0:L=0:RE
TURN
676 J=0:RETURN

  Sacrifice fly

680 SETCOLOR 4,4,12:SOUND 0,100,6,8:FOR
I=1 TO 100:NEXT I
681 IF OT>1 OR L=0 OR RND(0)<0.4 THEN RE
TURN
682 PRINT " SACRIFICE Run Scores !!! "
683 SETCOLOR 4,11,12:SOUND 0,200,6,8:FOR
 I=1 TO 200:NEXT I
684 P=P+1:L=0:OT=OT+1:H=9:RETURN

  Fielding routines

700 GRAPHICS 5:SETCOLOR 4,13,6:SETCOLOR
0,0,12:SETCOLOR B,9,8:SETCOLOR R,14,4:PO
KE 752,1:DU=0
702 IF RND(0)<0.5 THEN 750

  Infield ground ball

703 PRINT " Infield groundball !! ":?
704 SETCOLOR 4,1,10
705 X=INT(RND(0)%25)%2+10:Y=3:COLOR 3:GO
SUB 980
708 A=RND(0)%40+20:D=39:C=(RND(0)-0.5):E
=-(RND(0)+2)
720 COLOR 0:GOSUB 980
722 IF STICK(B)>4 AND STICK(B)<8 THEN X=
X+2:IF STRIG(B)=0 THEN DU=1:GOSUB 995:GO
TO 728
723 IF STICK(B)>8 AND STICK(B)<12 THEN X
=X-2:IF STRIG(B)=0 THEN DU=1:GOSUB 992:G
OTO 728
724 IF X<2 THEN X=2
725 IF X>74 THEN X=74
726 COLOR 3:GOSUB 980
728 IF A<3 OR A>76 THEN 745
730 LOCATE A,D-1,Z:IF Z=3 THEN GOTO 660
734 COLOR 0:PLOT A,D
735 A=A+C:D=D+E:COLOR 1:PLOT A,D:IF D<3
THEN GOTO 740
737 SOUND 0,D%5,10,5:IF DU>0 THEN 728
739 GOTO 720
740 IF ABS(X-A)>9 THEN GOTO 747
742 IF RND(0)<0.5 AND ABS(X+1-A)<5 THEN
E=1:H=1:PRINT " ERROR  # % @ & !!":SOUND
 0,150,10,6:GOTO 600
745 H=1:PRINT " SINGLE ":GOTO 600
747 H=2:PRINT " DOUBLE ":GOTO 600

  Fly ball to outfield

750 X=INT(RND(0)%25)%2+10:Y=34:COLOR 3:G
OSUB 980
751 PRINT " Flyball to the outfield !! "
:?
752 A=INT(RND(0)%20):D=INT(RND(0)%5):C=R
ND(0)+1:E=RND(0)+0.6
755 COLOR 1:PLOT 77,30:DRAWTO 77,39:PLOT
 A,D
760 COLOR 0:GOSUB 980
761 IF STRIG(B)=0 AND STICK(B)=15 THEN Y
=Y-2-RND(0)%6:DU=1:GOTO 766
762 IF STICK(B)>4 AND STICK(B)<8 THEN X=
X+1:IF STRIG(B)=0 THEN DU=1:GOSUB 995:GO
TO 767
763 IF STICK(B)>8 AND STICK(B)<12 THEN X
=X-1:IF STRIG(B)=0 THEN DU=1:GOSUB 992:G
OTO 767
764 IF X<2 THEN X=2
765 IF X>74 THEN X=74
766 COLOR 3:GOSUB 980
767 IF A+C>76 AND D<29 THEN GOTO 785
769 IF A+C>76 THEN GOTO 786
770 LOCATE A,D+1,Z:IF Z=3 THEN PRINT "OU
T":SOUND 0,40,4,10:GOTO 680
774 COLOR 0:PLOT A,D
775 A=A+C:D=D+E:COLOR 1:PLOT A,D:IF D>37
 THEN GOTO 790
780 SOUND 0,A+C+X+Y,10,5:IF DU>0 THEN GO
TO 767
783 GOTO 760
785 H=4:PRINT " HOME RUN ":GOTO 600
786 H=3:PRINT " TRIPLE ":GOTO 600
790 IF A>55 THEN GOTO 747
794 GOTO 742

  Field display
```

```
800 GRAPHICS 5:SETCOLOR 4,13,6:SETCOLOR
0,1,10:SETCOLOR B,9,8:SETCOLOR R,14,4:PO
KE 752,1

  Messages

805 PRINT " Runs   ";P;"      Outs     "
;OT
806 PRINT " BALLS  ";BL;"      STRIKES
";ST:?

  Display field and runners

810 COLOR 1:PLOT 35,31:DRAWTO 4,0
811 PLOT 44,31:DRAWTO 75,0
814 Z=19:FOR I=55 TO 60:PLOT I,Z:DRAWTO
40,60-I:DRAWTO I,Z-1:Z=Z-1:NEXT I
817 Z=14:FOR I=19 TO 24:PLOT I,Z:DRAWTO
39,I-19:DRAWTO I,Z-1:Z=Z+1:NEXT I
820 COLOR 3:B1=39:B2=5:GOSUB 990
822 B1=22:B2=17:GOSUB 990
824 B1=56:B2=17:GOSUB 990
825 PLOT 39,33:DRAWTO 41,33
826 PLOT 39,34:PLOT 41,34:PLOT 40,35
830 PLOT 38,10:DRAWTO 41,10
836 COLOR 2:PLOT 37,33:DRAWTO 37,37
840 IF J>0 THEN X=54:Y=11:GOSUB 980
842 IF K>0 THEN X=33:Y=2:GOSUB 980
844 IF L>0 THEN X=19:Y=19:GOSUB 980

  Pitch and swing routine; X,Y is the
  location of the ball

850 Y=11:X=38+INT(RND(0)%4):SW=0
852 A$=" RED ":IF B=2 THEN A$=" BLUE "
854 PRINT A$;"'S  PITCH  ???    ";

  Check for release of ball

855 S=STICK(B):IF S=15 THEN SOUND 0,RND(
0)%200,10,2:GOTO 855

  Speed of pitch

856 S=S/6
```

```
  Darken ball

860 COLOR 4:PLOT X,Y:SOUND 0,Y,10,8

  Curve on ball

862 IF STICK(B)=7 AND X<33 THEN X=X+0.3:
IF X>43 THEN X=43

863 IF STICK(B)=11 AND X<33 THEN X=X-0.3
:IF X<38 THEN X=38

  Move ball down, check for contact with
  bat

865 Y=Y+S:LOCATE X,Y,Z:IF Z=2 THEN 890
866 LOCATE X,Y+1,Z:IF Z=2 THEN 890
867 LOCATE X,Y+2,Z:IF Z=2 THEN 890

  Display ball
```

```
870 COLOR 1:PLOT X,Y

  Check if bat was swung

871 IF SW>0 THEN GOSUB 900+SW:SW=SW+1:GO
TO 873

  Begin swing

872 IF STICK(R)<>15 THEN SW=1

  Loop until ball passes home plate

873 IF Y<38 THEN 860

  Pitch was a ball

874 IF SWK1 AND (X<39 OR X>41) THEN BL=B
L+1:SETCOLOR 4,12,10:SOUND 0,200,6,4:FOR
 I=1 TO 30:NEXT I:GOTO 877

  Pitch was a strike

875 ST=ST+1:SETCOLOR 4,8,10:SOUND 0,100,
10,8:FOR I=1 TO 30:NEXT I

  Walk or strikeout

877 IF BL=4 THEN 884
878 IF ST=3 THEN 885

  Get another pitch

879 GOTO 800
884 PRINT " WALK":H=9:SETCOLOR 4,12,10:S
OUND 0,100,6,8:GOTO 650
885 PRINT "STRIKE OUT":SETCOLOR 4,8,10:F
OR I=1 TO 100:SOUND 0,200,10,8:NEXT I:RE
TURN

  Move hit ball up screen

890 D=RND(0):IF RND(0)<0.5 THEN D=-D
891 SOUND 0,S,4,14
892 COLOR 0:PLOT X,Y:X=X+D:Y=Y-1
894 IF Y<1 THEN 700
896 COLOR 1:PLOT X,Y:SOUND 0,X+2*Y,4,14:
GOTO 892

  Displays swinging bat

901 COLOR 4:PLOT 37,33:DRAWTO 37,37:COLO
R 2:PLOT 37,33:DRAWTO 41,37:RETURN
902 COLOR 4:PLOT 37,33:DRAWTO 41,37:COLO
R 2:PLOT 37,33:DRAWTO 42,33:RETURN
903 COLOR 4:PLOT 37,33:DRAWTO 42,33:COLO
R 2:PLOT 37,33:DRAWTO 41,29:RETURN
904 COLOR 4:PLOT 37,33:DRAWTO 41,29:RETU
RN
905 SW=4:COLOR 2:PLOT 37,33:DRAWTO 37,29
:RETURN

  Sound for song

950 SOUND 0,NK(NT),10,8
952 FOR I=1 TO 10:NEXT I
954 NT=NT+1:IF NT>47 THEN NT=1
956 RETURN

  Displays base runner

980 PLOT X+1,Y:PLOT X,Y+1:DRAWTO X+2,Y+1
:PLOT X+1,Y+2
982 PLOT X,Y+3:PLOT X,Y+4:PLOT X+2,Y+3:P
LOT X+2,Y+4:RETURN

  Displays base runner

980 PLOT X+1,Y:PLOT X,Y+1:DRAWTO X+2,Y+1
:PLOT X+1,Y+2
982 PLOT X,Y+3:PLOT X,Y+4:PLOT X+2,Y+3:P
LOT X+2,Y+4:RETURN

  Displays base pads

990 PLOT B1,B2:PLOT B1+1,B2:PLOT B1,B2+1
:PLOT B1+1,B2+1:RETURN

  Displays fielder diving left or right

992 COLOR 3:X=X-RND(0)*9:IF X<1 THEN X=1

993 PLOT X,Y+1:PLOT X+1,Y+2:DRAWTO X+1,Y
+4:PLOT X,Y+3:PLOT X+2,Y+3:PLOT X+3,Y+2:
PLOT X+4,Y+2
994 PLOT X+3,Y+4:PLOT X+4,Y+4:RETURN
995 COLOR 3:X=X+RND(0)*9:IF X>70 THEN X=
70
996 PLOT X,Y+2:PLOT X+1,Y+2:PLOT X+2,Y+3
:DRAWTO X+4,Y+3:PLOT X+3,Y+2:PLOT X+3,Y+
4:PLOT X+4,Y+1
997 PLOT X,Y+4:PLOT X+1,Y+4:RETURN
```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SAY YOHO

by Scott Adams

A monthly column on Compunovels.

Yes, there is a Scott Adams, and in the upcoming months I will be talking on many things, but basically I'll be covering topics and items having to do with role-playing fantasy games, hereafter referred to as "Compunovels." I will touch on some of the following items:

1. What makes a good Compunovel.
2. Bugs and problems in current programs.
3. Hints on how to play Compunovels and strategies to take.
4. How to write a good Compunovel.
5. Some history on Compunovels.

Today I'll start with number 2 above, Bugs & Problems.

There have been many complaints that the Radio Shack debounce routine KBFIX would not work with my Adventure series on a 16K Level II. This was due to Adventure's extremely large size; the program actually runs from 4300 (hex) to 7FFF, which is the top of memory in 16K!

Since there really was no room for even a ten-word patch anywhere in Adventure, I didn't even consider trying to put in any sort of key debounce. (Remember that KBFIX uses approximately 55 bytes!)

In early February, 1980, I received a letter fron Vince Pepe of Seattle, Washington, that laid out a clever little program which would run in conjunction with Adventure and supply the needed key debounce. This was done by using the 23 bytes that are available at the beginning of Adventure. Adventure starts at 4300 (hex) but it turns out RAM is free from 42F9, thereby giving me a much-needed patch area.

I implemented Vince's patch and found it worked well, but my old companion, the blinking cursor, was now stationary. This was due to the longer delay put into my key in routine. "Aha," I said. "I will just have this patch also change the delay counter built into Adventure." Unfortunately, I found that no matter how I tried I was always two bytes oversized! Then I made my discovery.

I found that I already had a delay loop in Adventure which counted down from 500 before blinking the cursor. If I could change the one-byte address so it just continued decrementing the counter instead of rereading the keyboard, I would have it. And so I tried modifying the location, and it worked! Now I could provide key debounce. Then another problem arose.

How to have previous owners patch their copy of Adventure?

The solution I came up with was simple. Upon powering up their TRS-80s, they would set the stack so it was within a large buffer which is in Adventure; then, using a simple BASIC POKE statement, they could modify the required two bytes. (While I was at it I changed the cursor character too).

Here then is the procedure to use in patching Adventure version 8.2 on tape to have key debounce: (Note this will not work with any version earlier than 8.2)

1. Power up system
2. Answer MEMORY SIZE with 22736
3. Type: SYSTEM
4. Rewind Adventure tape and hit play
5. Type: ADVENT. This will load the Adventure as usual.
6. When the *? returns, instead of hitting "/" as usual, just hit the (ENTER) key instead. You will get back the message ?SN ERROR. This is normal. BASIC now has set its stack within Adventure's internal buffer area. (SYSTEM uses its stack inside of the BASIC input buffer.)
7. Type: POKE 18364,251 (ENTER) This will change the address inside of Adventure as needed.
8. Type: POKE 18348,93 (ENTER) This will change the cursor character.
9. Type: SYSTEM (ENTER) Re-enter system so we can start Adventure.
10. Type: / 17232 (ENTER) Adventure will now start running, and the cursor will be blinking, though much faster than before, and all keybouncing should disappear!

Next month, a look at the new ODYSSEY series.

'Til then . . . . May all your Adventures be stimulating!

ATARI PROGRAMMING HINTS

Most Atari programs make use of graphics. While you are still perfecting your graphic masterpiece, it is necessary to alternate between graphics (to see how the picture is progressing) and text, to continue editing the program. It can become tiring to constantly type GR.0:L.nnn,mmm (where nnn and mmm are the beginning and ending line numbers you are currently working on). Here is an alternative:Let's say that the first line number in your program is 10. Add the following lines:

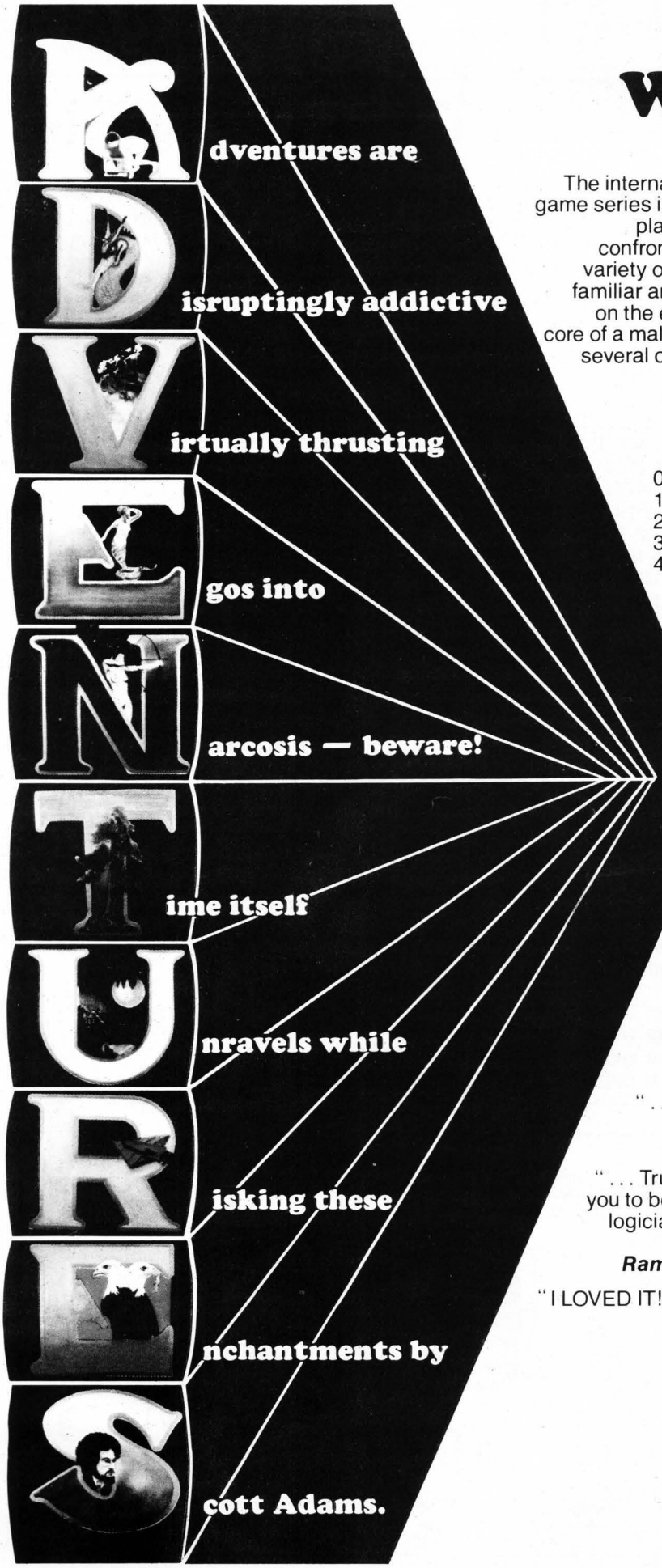
```
0 G.10
1 GR.0:L.nnn,mmm:END
```

(where nnn and mmm are the above-mentioned line numbers). Now, when you are ready to edit your program, you can simply type:

G.1

and the graphics will magically give way to the appropriate listing of your program. From there, you may continue editing the program. When you move on to a different graphic section of your program, just change nnn and mmm in line 1.

James Garon
Milford, New Hampshire



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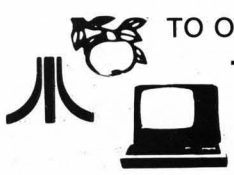

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SOUND FOR YOUR COMPUTER

SOUND FOR YOUR COMPUTER is a program for Apple, Atari, and S-80.

by James Hagani, James Garon, Rich Bouchard, and Mark Pelczarski

It has often been said that the young are more easily influenced than the old. This has been quite true pertaining to the home computer field and nothing has had quite the impact upon it as has the box-office bonanza **Star Wars**. This motion picture has enhanced the whole genre of computer space games. These programs have become so popular that now a **Star Trek** program is more mandatory for a complete game library than an Inventory Controller is for a general ledger package. Therefore, it seems only fitting to center all of this month's column on the movie that started it all.

This movie has one of the most interesting and difficult sound effects to reproduce: the swishing of the "light sabers" with which Obi-Wan Kenobi battled Darth Vader. The creation of this sound effect requires a very low humming tone followed by an increasing then decreasing pitch of a similar hum. On the three computers covered, the Atari, Apple and S-80 Model I, a very high pitch was more easily obtained than a low one. In fact, the highest tone possible is too high for the human ear to recognize! This interesting quirk in the machines' generation of sounds makes the "saber sound" very difficult to perfect.

Following are short subroutines that generate this sound effect. If you have any suggestions for possible sound effects or have one you think would be of general interest, please feel free to send them to one of us in care of this magazine.

Apple Version

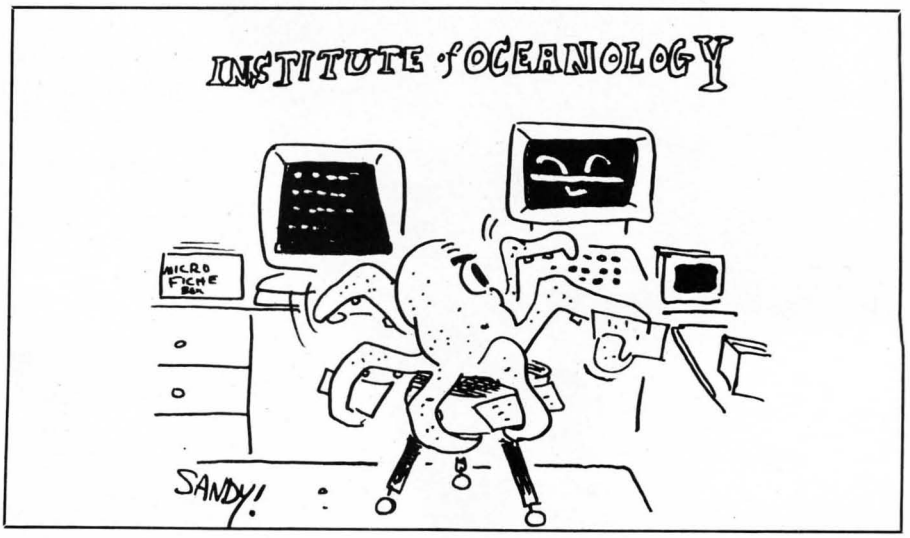
```
150  GOSUB 480
210  FOR I = 1 TO 200
220  & T255,1
225  FOR P = 1 TO 8
226  NEXT P
230  NEXT I
240  FOR P = 250 TO 50 STEP  - 2
250  & TP,2
260  NEXT P
270  FOR P = 50 TO 250 STEP 2
280  & TP,2
290  NEXT P
300  GOTO 210
470  END
480  FOR I = 768 TO 833: READ P: POKE
     I,P: NEXT I
500  DATA 201,84,208,15,32,177,0,
     32,248,230,138,72,32,183,0,2
     01,44,240,3,76,201,222,32,17
     7,0,32,248,230
520  DATA 104,134,3,134,1,133,0,1
     70,160,1,132,2,173,48,192,13
     6,208,4,198
530  DATA   1,240,7,202,208,246,1
     66,0,208,239,165,3,133,1,198
     ,2,208,241,96
580  POKE 1013,76: POKE 1014,0: POKE
     1015,3
590  RETURN
```

Atari Version

```
10 SOUND 0,255,10,8
20 SOUND 1,254,10,8
30 SOUND 2,253,10,8
40 SOUND 3,252,10,8
50 GOSUB 120:GOSUB 120:GOSUB 120
60 SOUND 0,246,10,15
70 SOUND 1,247,10,15
80 SOUND 2,248,10,15
90 SOUND 3,249,10,15
100 GOSUB 120
110 GOTO 10
120 FOR X=1 TO 100:NEXT X
130 RETURN
```

S-80 Version

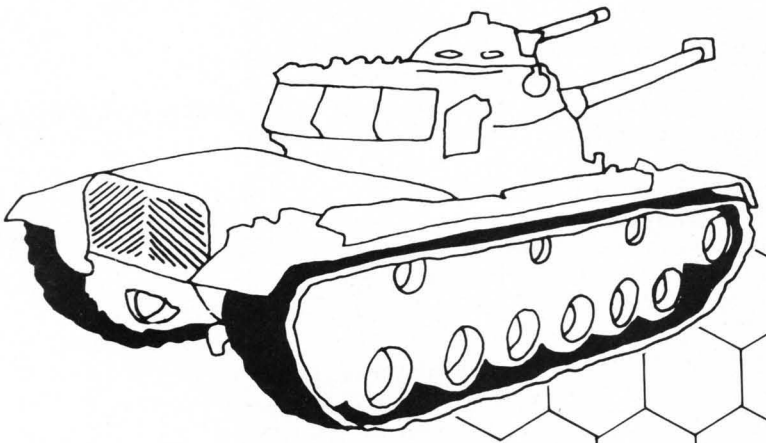
```
10 MM$="BE SURE THERE ARE 27 SPACES
20 I=VARPTR(MM$):J=PEEK(I+1)+256*PEEK(I+2)
30 FOR K=J TO J+26:READ X:POKE K,X:NEXT
40 IF PEEK(16396)=201 POKE16526,PEEK(I+1):POKE16527,PEEK(I+2)ELS
E CMD"T":DEFUSR0=J:POKE14308,1
50 DATA 205,127,10,77,68,62,1,105,211,255,45,32,253,60,105,211,2
55,45,32,253,13,16,238,175,211,255,201
60 CLS
70 FOR XX=1 TO 99:X=USR(256):NEXT XX
80 FOR XX=512 TO 320 STEP -6:X=USR(XX):NEXT
90 FOR XX=325 TO 512 STEP 6:X=USR(XX):NEXT:GOTO70
```



Three from Potkin.

Wargamers delight!

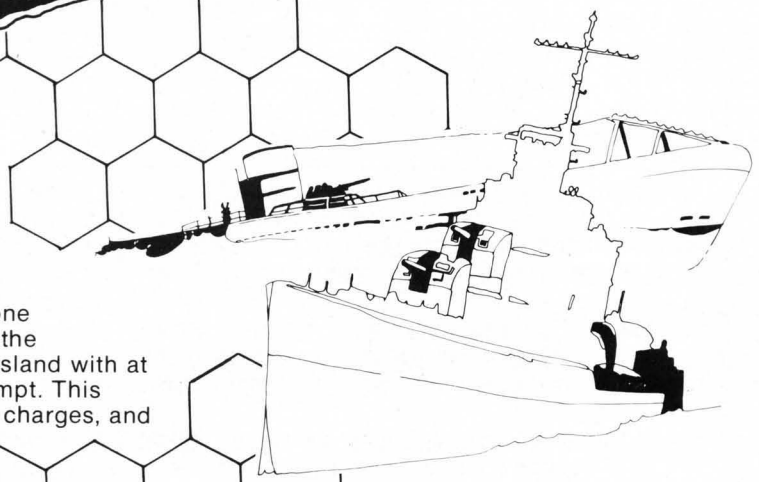
1). Kriegspiel II.



A much improved two-player version of the original. Kriegspiel II is a war-gamer's delight. Choose the number of mountains (up to 200) and pick a scenario from the 9,999 possible, and then watch the computer set up the pieces, towns, mountains and a river. To win, you must enter the capital city of your opponent or reduce his fighting strength to below half of your own

S-80 Level II, 16K cassette $14.95

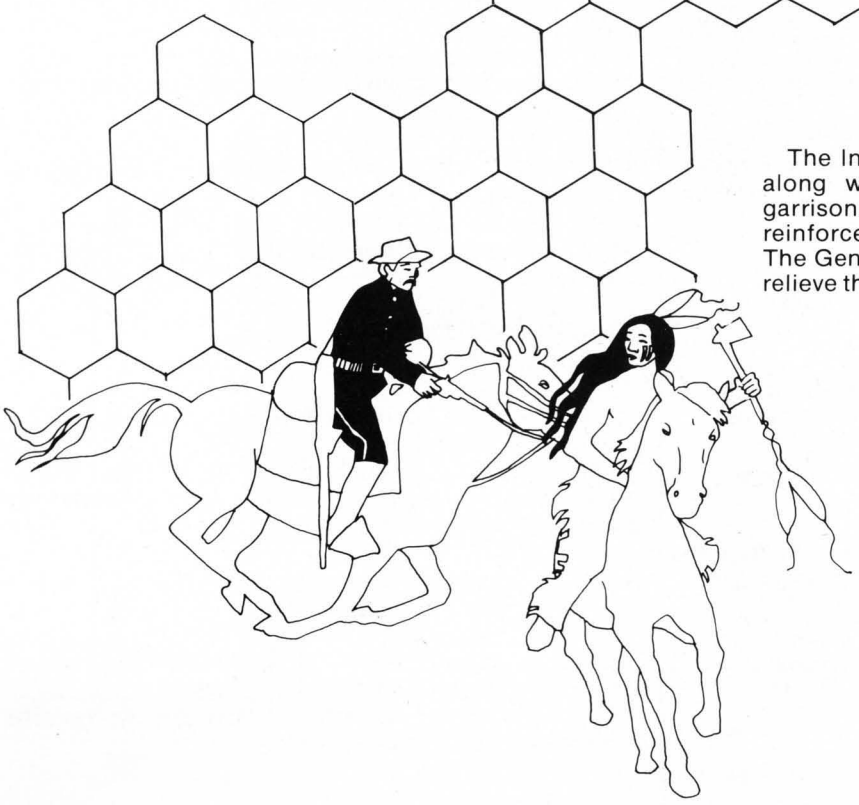
2). Up Periscope



The author of the popular Kriegspiel II has done it again. This time the action takes place at sea with one player controlling the submarines while the other attempts to sail around RADSHA Island with at least three of his fleet surviving the attempt. This realistic wargame includes sonar, depth charges, and torpedoes.

S-80 Level II, 16K cassette $14.95

3). Warpath.



The Indians are on the warpath! The Chief, along with 24 braves, is out to take the garrison at the fort, or at least to stop reinforcements from entering the stockade. The General, with his 14 troopers, is trying to relieve the garrison before the flag is captured.

The player determines the scenario through placement of boulders that provide both shelter and obstacles. Favorite scenarios may be replayed.

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ESCAPE

ESCAPE is an S-80 program requiring 16K.

by Joel Mick

In ESCAPE, you are shown a maze being generated. After the maze is complete, you are shown your starting position on the left side of the maze, and the exit on the right side. About ten seconds later, the screen will clear and you will be shown a view as if you were standing in the maze. You will be facing right (towards the exit). To move forward, use the F key or the up arrow. To turn right, use the R key or the right arrow, and to turn left, use the L key or the left arrow. The A key or down arrow does an about face. Only forward actually moves you. The other commands only change the direction you are facing. If you are lost, pressing the H key will give you a bird's-eye view of the maze, your position, and the exit. When you escape, your score will be shown on a scale of 1 to 100.

Following is a list of the major variables used:

Z$ (12) Stores the picture of the maze.

L$ (15) Stores the picture of the X so that it doesn't have to be set each time it is drawn.

Z$ Used to draw the grid in line 9. When saving the screen, it is used as a dummy string. (See note above).

M(273) Stores the status of each cell of the maze. (Whether there is a wall in each direction).

X, Y Are the coordinates of the player's position in the maze.

DX, DY Are the directions the player is facing.

EX, EY Are the coordinates of the exit from the maze.

Z4 Is the current score.

```
   Lines 1-7: Initialize arrays and print instructions.

1 CLEAR2999:DEFINTA-Z:ONERRORGOTO130:DIMZ$(12),L$(15)
2 CLS:PRINTTAB(29)"ESCAPE":PRINTTAB(16)"COPYRIGHT (C) 1980 - BY
JOEL MICK"
3 PRINT"IN ESCAPE, YOU ARE SHOWN A MAZE BEING GENERATED. AFTER T
HE MAZE IS COMPLETE, YOU ARE SHOWN YOUR STARTING POSITION ON THE
 LEFT   SIDE OF THE MAZE, AND THE EXIT ON THE RIGHT SIDE. ABOUT
TEN"
4 PRINT"SECONDS LATER, THE SCREEN WILL CLEAR AND YOU WILL BE SHO
WN A    VIEW AS IF YOU WERE STANDING IN THE MAZE. YOU WILL BE FA
CING    RIGHT (TOWARD THE EXIT). TO MOVE FORWARD, USE THE F KEY
OR THE"
5 PRINT"UP ARROW. TO TURN RIGHT, USE THE R KEY OR THE RIGHT ARRO
W, AND  TO TURN LEFT, USE THE L KEY OR THE LEFT ARROW. THE A KEY
 OR     DOWN ARROW DOES AN ABOUT FACE. ONLY FORWARD ACTUALLY MOV
ES YOU."
6 PRINT"THE OTHER COMMANDS ONLY CHANGE THE DIRECTION YOU ARE FAC
ING. IF YOU ARE LOST, PRESSING THE H KEY WILL GIVE YOU A BIRDS E
YE VIEW OF THE MAZE, YOUR POSITION, AND THE EXIT. WHEN YOU ESCAP
E, YOUR SCORE WILL BE SHOWN ON A SCALE OF 1 TO 100."
7 PRINTTAB(21)"PRESS <ENTER> TO PLAY";

   Line 8: Wait for ENTER key.  Flash message if ENTER hasn't
       been hit for a while.

8 FORZ=1TO100:A$=INKEY$:IFA$=CHR$(13)THEN9ELSENEXT:IFPEEK(16347)
=32PRINT@987,"<ENTER>";:GOTO8ELSEPRINT@987,"       ";:GOTO8

   Line 9: Clear screen.  Compose grid in Z$.  Print the grid
       upon which the maze will be drawn.

9 CLS:Z$=CHR$(191)+STRING$(2,131):Z$=Z$+Z$+Z$+Z$+Z$+Z$+Z$:Z$=Z$+
Z$+Z$+CHR$(191):FORI=1TO13:PRINTZ$;:NEXT:PRINTSTRING$(64,131);

   Lines 10-33: Draw the maze at random.  When a wall is taken
       away, reset it on the screen and save the change in the
       array M.

10 DIMM(273)
11 FORI=1TO273:M(I)=11:NEXT
12 X=RND(21):Y=RND(13):C=273
13 IFC=1THEN34
14 Z4=0:Z3=0:Z5=0:Z2=0:K=X+21*(Y-1):M(K)=-ABS(M(K)):C=C-1
15 IFX<>21THENZ4=M(K+1)>0
16 IFY<>13THENZ3=M(K+21)>0
17 IFX<>1THENZ5=M(K-1)>0
18 IFY<>1THENZ2=M(K-21)>0
19 Z1=-Z4-Z3-Z5-Z2
20 IF(Z1<3ANDRND(15)<3)ORZ1=0THEN31
21 PO=RND(4)
22 ONPOGOTO23,25,27,29
23 IFNOTZ4THEN21ELSEM(K)=M(K)+1:X=X+1
24 RESET(6*X-6,3*Y-2):RESET(6*X-6,3*Y-1):RESET(6*X-5,3*Y-2):RESE
T(6*X-5,3*Y-1):GOTO13
25 IFNOTZ3THEN21ELSEM(K)=M(K)+10:Y=Y+1
26 RESET(6*X-4,3*Y-3):RESET(6*X-3,3*Y-3):RESET(6*X-2,3*Y-3):RESE
T(6*X-1,3*Y-3):GOTO13
27 IFNOTZ5THEN21ELSEM(K-1)=M(K-1)-1:X=X-1
28 RESET(6*X,3*Y-2):RESET(6*X,3*Y-1):RESET(6*X+1,3*Y-2):RESET(6*
X+1,3*Y-1):GOTO13
29 IFNOTZ2THEN21ELSEM(K-21)=M(K-21)-10:Y=Y-1
30 RESET(6*X-4,3*Y):RESET(6*X-3,3*Y):RESET(6*X-2,3*Y):RESET(6*X-
1,3*Y):GOTO13
31 X=RND(21):Y=RND(13)
32 IFM(X+21*(Y-1))>0THEN31
33 C=C+1:GOTO13

   Line 34: Pick the initial position and exit and draw them.

34 X=1:Y=RND(13):EX=21:EY=RND(13):RESET(127,EY*3-2):RESET(127,EY
*3-1):RESET(126,EY*3-2):RESET(126,EY*3-1):FORX1=X*6-4TOX*6-1:SET
(X1,Y*3-2):SET(X1,Y*3-1):NEXT

   Line 35: Set up the initial direction and save the picture
       of the maze in array Z$ (see note).

35 DX=1:DY=0:FORZ5=0TO12:POKEVARPTR(Z$)+1,(Z5-INT(Z5/4)*4)*64:PO
KEVARPTR(Z$)+2,60+INT(Z5/4):Z$(Z5)=Z$:NEXT:Z$(Y-1)=CHR$(191)+STR
ING$(2,131)+RIGHT$(Z$(Y-1),61):IFM(Y*21-41)=-1ORM(Y*21-41)=0THEN
Z$(Y-1)=CHR$(191)+"  "+RIGHT$(Z$(Y-1),61)
```

Line 36: Let the player examine the completed maze for a little while, then erase it and draw the "X" (see line 131).

```
36 FORZ5=1TO3000:NEXT:CLS:GOSUB131:Z4=175
```

Lines 37-50: Get player's move. If it is not valid, such as moving into a wall, then ignore it. If it is valid, then change player's position or direction, and draw the new perspective.

```
37 GOSUB56
38 A$=INKEY$:IFA$=""THEN38
39 IFA$="R"ORA$=CHR$(9)THENIFDX=1THENDX=0:DY=1:GOTO37ELSEIFDY=1T
HENDY=0:DX=-1:GOTO37ELSEIFDX=-1THENDX=0:DY=-1:GOTO37ELSEDY=0:DX=
1:GOTO37
40 IFA$="L"ORA$=CHR$(8)THENIFDX=1THENDX=0:DY=-1:GOTO37ELSEIFDY=1
THENDY=0:DX=1:GOTO37ELSEIFDX=-1THENDX=0:DY=1:GOTO37ELSEDY=0:DX=-
1:GOTO37
41 IFA$="A"ORA$=CHR$(10)THENDX=-DX:DY=-DY:GOTO37
42 IFA$="H"THENZ4=Z4-10:GOTO51
43 IFA$<>"F"ANDA$<>CHR$(91)THEN38ELSEZ4=Z4-1
44 IF(DX=-1ANDX=1)OR(DY=-1ANDY=1)THEN38
45 IFDX=1ANDX=EXANDY=EYTHEN54
46 IFDX=1AND(M(P)=-1ORM(P)=-11)THEN38
47 IFDY=1AND(M(P)=-10ORM(P)=-11)THEN38
48 IFDX=-1AND(M(P-1)=-1ORM(P-1)=-11)THEN38
49 IFDY=-1AND(M(P-21)=-10ORM(P-21)=-11)THEN38
50 X=X+DX:Y=Y+DY:GOTO37
```

Lines 51-53: This routine draws the maze from Z$.

```
51 CLS:FORC=0TO12:PRINTZ$(C);:NEXT:PRINTSTRING$(64,131);
52 FORX1=X*6-4TOX*6-1:SET(X1,Y*3-2):SET(X1,Y*3-1):NEXT:PRINT@980
,"PRESS ENTER TO CONTINUE";:PRINT@919,"I AM FACING ";:IFDX=1THEN
PRINT"EAST";ELSEIFDX=-1THENPRINT"WEST";ELSEIFDY=1THENPRINT"SOUTH
";ELSEPRINT"NORTH";
53 A$=INKEY$:IFA$<>CHR$(13)THEN53ELSE37
```

Lines 54-55: Print the score and wait for player to press ENTER before starting a new game.

```
54 PRINT@282,"YOU MADE IT!";:PRINT@403,"PRESS ENTER TO PLAY AGAI
N";:PRINT@339,"YOUR PERFORMANCE RATES";:IFZ4<1THENZ4=1:PRINT@361
,Z4;ELSEIFZ4>100THENZ4=100:PRINT@361,Z4;ELSEPRINT@361,Z4;
55 A$=INKEY$:IFA$<>CHR$(13)THEN55ELSERUN
```

Lines 56-129: This routine draws the perspective view of the maze by checking what direction the player is facing, and whether certain walls exist or not.

```
56 M=4:P=X+Y*21-21:PRINT@0;:FORZ5=0TO15:PRINTL$(Z5);:NEXT:POKE16
383,164
57 IFDX=1ANDX=EXANDY=EYTHENM=0:FORX1=28TO99:RESET(X1,X1*47/127):
RESET(X1,47-X1*47/127):NEXT:GOTO88
58 IFDX=1AND(M(P)=-1ORM(P)=-11)THENGOSUB126:GOTO88
59 IFDY=1AND(M(P)=-10ORM(P)=-11)THENGOSUB126:GOTO88
60 IFX=1THENIFDX=-1THENGOSUB126:GOTO88ELSEGOTO62
61 IFDX=-1AND(M(P-1)=-1ORM(P-1)=-11)THENGOSUB126:GOTO88
62 IFY=1THENIFDY=-1THENGOSUB126:GOTO88ELSEGOTO64
63 IFDY=-1AND(M(P-21)=-10ORM(P-21)=-11)THENGOSUB126:GOTO88
64 IFX=21THENIFDX=1THENGOSUB127:GOTO88ELSEGOTO66
65 IFDX=1AND(M(P+1)=-1ORM(P+1)=-11)THENGOSUB127:GOTO88
66 IFY=13THENIFDY=1THENGOSUB127:GOTO88ELSE68
67 IFDY=1AND(M(P+21)=-10ORM(P+21)=-11)THENGOSUB127:GOTO88
68 IFX<3THENIFDX=-1THENGOSUB127:GOTO88ELSEGOTO70
69 IFDX=-1AND(M(P-2)=-1ORM(P-2)=-11)THENGOSUB127:GOTO88
70 IFY<3THENIFDY=-1THENGOSUB127:GOTO88ELSEGOTO72
71 IFDY=-1AND(M(P-42)=-10ORM(P-42)=-11)THENGOSUB127:GOTO88
72 IFX>19THENIFDX=1THENGOSUB128:GOTO88ELSEGOTO74
73 IFDX=1AND(M(P+2)=-1ORM(P+2)=-11)THENGOSUB128:GOTO88
74 IFY>11THENIFDY=1THENGOSUB128:GOTO88ELSEGOTO76
75 IFDY=1AND(M(P+42)=-10ORM(P+42)=-11)THENGOSUB128:GOTO88
76 IFX<4THENIFDX=-1THENGOSUB128:GOTO88ELSEGOTO78
77 IFDX=-1AND(M(P-3)=-1ORM(P-3)=-11)THENGOSUB128:GOTO88
78 IFY<4THENIFDY=-1THENGOSUB128:GOTO88ELSE80
79 IFDY=-1AND(M(P-63)=-10ORM(P-63)=-11)THENGOSUB128:GOTO88
80 IFX>18THENIFDX=1THENGOSUB129:GOTO88ELSE82
81 IFDX=1AND(M(P+3)=-1ORM(P+3)=-11)THENGOSUB129:GOTO88
82 IFY>10THENIFDY=1THENGOSUB129:GOTO88ELSE84
83 IFDY=1AND(M(P+63)=-10ORM(P+63)=-11)THENGOSUB129:GOTO88
84 IFX<5THENIFDX=-1THENGOSUB129:GOTO88ELSE86
85 IFDX=-1AND(M(P-4)=-1ORM(P-4)=-11)THENGOSUB129:GOTO88
86 IFY<5THENIFDY=-1THENGOSUB129:GOTO88ELSEGOTO88
87 IFDY=-1AND(M(P-84)=-10ORM(P-84)=-11)THENGOSUB129
88 IFX=EXANDY=EYANDDX=1THENPRINT@206,CHR$(170)STRING$(14,191)" E
XIT "STRING$(14,191)CHR$(149);:FORC=256TO768STEP64:PRINT@C+14,CH
R$(170)STRING$(3,191);:PRINT@C+46,STRING$(3,191)CHR$(149);:NEXT
89 IF(DX=-1ANDY=1)OR(DY=1ANDX=1)THEN94
90 IF(DX=1AND(M(P)=-10ORM(P)=-11))OR(DY=-1AND(M(P)=-1ORM(P)=-11)
)THEN94
91 IFDY=1AND(M(P-1)=-1ORM(P-1)=-11)THEN94
92 IFDX=-1AND(M(P-21)=-10ORM(P-21)=-11)THEN94
93 FORX1=0TO14:PRINT@64*X1+50,CHR$(206);:NEXT:PRINT@1010,STRING$
(13,32);:POKE16383,32:A$=STRING$(14,191):FORC=242TO818STEP64:PRI
NT@C,A$;:NEXT
94 IF(DX=1ANDY=1)OR(DY=-1ANDX=1)THEN99
95 IF(DY=1AND(M(P)=-1ORM(P)=-11))OR(DX=-1AND(M(P)=-10ORM(P)=-11)
)THEN99
96 IFDX=1AND(M(P-21)=-10ORM(P-21)=-11)THEN99
97 IFDY=-1AND(M(P-1)=-1ORM(P-1)=-11)THEN99
98 FORX1=0TO15:PRINT@64*X1,CHR$(206);:NEXT:A$=STRING$(14,191):FO
RC=192TO768STEP64:PRINT@C,A$;:NEXT
99 IFM=0THENRETURN
100 IF(DX=-1ANDY=1)OR(DY=1ANDX=1)THEN106
101 IFDX=1AND(M(P+1)=-10ORM(P+1)=-11)THEN106
102 IFDY=1AND(M(P+20)=-1ORM(P+20)=-11)THEN106
103 IFDX=-1AND(M(P-22)=-10ORM(P-22)=-11)THEN106
104 IFDY=-1AND(M(P-21)=-1ORM(P-21)=-11)THEN106
105 FORX1=84TO93:RESET(X1,X1*47/127):RESET(X1,47-X1*47/127):NEXT
:PRINT@362,STRING$(5,188);:PRINT@682,STRING$(5,131);:FORC=426TO6
18STEP64:PRINT@C,STRING$(6,191);:NEXT:PRINT@303,CHR$(191);:PRINT
@367,CHR$(191);:PRINT@687,CHR$(191);:PRINT@751,CHR$(191);
106 IF(DX=1ANDY=1)OR(DY=-1ANDX=1)THEN112
107 IFDX=1AND(M(P-20)=-10ORM(P-20)=-11)THEN112
108 IFDY=1AND(M(P+21)=-1ORM(P+21)=-11)THEN112
109 IFDX=-1AND(M(P-1)=-10ORM(P-1)=-11)THEN112
110 IFDY=-1AND(M(P-22)=-1ORM(P-22)=-11)THEN112
111 FORX1=34TO43:RESET(X1,X1*47/127):RESET(X1,47-X1*47/127):NEXT
:PRINT@337,STRING$(5,188);:PRINT@657,STRING$(5,131);:FORC=400TO5
92STEP64:PRINT@C,STRING$(6,191);:NEXT:PRINT@272,CHR$(191);:PRINT
@336,CHR$(191);:PRINT@656,CHR$(191);:PRINT@720,CHR$(191);
112 IFM=1THENRETURN
113 IF(DX=-1ANDY=1)OR(DY=1ANDX=1)THEN119
114 IFDX=1AND(M(P+2)=-10ORM(P+2)=-11)THEN119
115 IFDY=1AND(M(P+41)=-1ORM(P+41)=-11)THEN119
116 IFDX=-1AND(M(P-23)=-10ORM(P-23)=-11)THEN119
117 IFDY=-1AND(M(P-42)=-1ORM(P-42)=-11)THEN119
118 FORX1=73TO79:RESET(X1,X1*47/127):RESET(X1,47-X1*47/127):NEXT
:PRINT@421,STRING$(3,176);CHR$(191);:PRINT@485,STRING$(4,191);:P
RINT@549,STRING$(4,191);:PRINT@613,"   ";CHR$(191);
119 IF(DX=1ANDY=1)OR(DY=-1ANDX=1)THEN125
120 IFDX=1AND(M(P-19)=-10ORM(P-19)=-11)THEN125
121 IFDY=1AND(M(P+42)=-1ORM(P+42)=-11)THEN125
122 IFDX=-1AND(M(P-2)=-10ORM(P-2)=-11)THEN125
123 IFDY=-1AND(M(P-43)=-1ORM(P-43)=-11)THEN125
124 FORX1=48TO54:RESET(X1,X1*47/127):RESET(X1,47-X1*47/127):NEXT
```

continued on page 86

MONSTER MAZE WITH SOUND

MONSTER MAZE is an S-80 program requiring 16K.

by Joel Mick

Welcome to Monster Maze. You will study a maze as I create it, but when it's complete, I'll erase the picture. Then the only way to see the walls is to move into them, which costs points. To move, use the arrow keys, or if you wish, use 'U' for up, 'D' for down, 'R' for right, and 'L' for left. Your object is to escape the maze without getting eaten by the monster (letting him land on you). You will start on the left side of the maze, and the monster will enter the maze upon your initial move. You and the monster are both displayed as white boxes so you should keep aware of your position. You lose one point every time you hit a wall, which will then appear to help you find your way out.

```
   Lines 1-11: Initialize machine language sound routine;
       print heading; wait for ENTER.

1 CLEAR500:DEFINTA-Z:DATA205,127,10,77,68,62,1,105,211,255,45,32
,253,60,105,211,255,45,32,253,13,16,238,175,211,255,201
2 M$="HERE'S WHERE THE SOUND GOES"
3 I=VARPTR(M$):J=PEEK(I+1)+256*PEEK(I+2):FORK=JTOJ+26:READX:POKE
K,X:NEXT
4 IFPEEK(16396)=201POKE16526,PEEK(I+1):POKE16527,PEEK(I+2)ELSECM
D"T":DEFUSR0=J:POKE14308,0
5 CLS:PRINTTAB(20)"MONSTER MAZE WITH SOUND":PRINTTAB(15)"COPYRIG
HT (C) 1980 - BY JOEL MICK
10 PRINT@981,"PRESS <ENTER> TO BEGIN";
11 FORZ=1TO125:A$=INKEY$:IFA$=CHR$(13)THEN12ELSENEXT:IFPEEK(1634
7)=32THENPRINT@987,"<ENTER>";:GOTO11ELSEPRINT@987,"       ";:GOT
O11

   Lines 12-13: Create the grid upon which maze will be drawn.

12 S=1001:CLS:A$=CHR$(191)+STRING$(2,131):A$=A$+A$+A$+A$+A$+A$+A
$:A$=A$+A$+A$+CHR$(191):FORI=1TO13:PRINTA$;:NEXT:PRINTSTRING$(64
,131);
13 PRINT"MONSTER MAZE"TAB(52)"BY JOEL MICK";

   Lines 14-37: Draw the maze at random.  When a wall is taken
       away, reset (erase) it on the screen and note change in
       the array.

14 DIMW(273),T(273)
15 FORI=1TO273:W(I)=11:NEXT
16 AA=RND(21):BB=RND(13):C=273
17 IFC=1THEN38
18 Z1=0:Z4=0:Z2=0:Z3=0:K=AA+21*(BB-1):W(K)=-ABS(W(K)):C=C-1
19 IFAA<>21THENZ1=W(K+1)>0
20 IFBB<>13THENZ4=W(K+21)>0
21 IFAA<>1THENZ2=W(K-1)>0
22 IFBB<>1THENZ3=W(K-21)>0
23 Z5=-Z1-Z4-Z2-Z3
24 IF(Z5<3ANDRND(15)<3)ORZ5=0THEN35
25 H=RND(4)
26 ONHGOTO27,29,31,33
27 IFNOTZ1THEN25ELSEW(K)=W(K)+1:AA=AA+1
28 Z=USR(900):RESET(6*AA-6,3*BB-2):RESET(6*AA-6,3*BB-1):RESET(6*
AA-5,3*BB-2):RESET(6*AA-5,3*BB-1):GOTO17
29 IFNOTZ4THEN25ELSEW(K)=W(K)+10:BB=BB+1
30 Z=USR(900):RESET(6*AA-4,3*BB-3):RESET(6*AA-3,3*BB-3):RESET(6*
AA-2,3*BB-3):RESET(6*AA-1,3*BB-3):GOTO17
31 IFNOTZ2THEN25ELSEW(K-1)=W(K-1)-1:AA=AA-1
32 Z=USR(900):RESET(6*AA,3*BB-2):RESET(6*AA,3*BB-1):RESET(6*AA+1
,3*BB-2):RESET(6*AA+1,3*BB-1):GOTO17
33 IFNOTZ3THEN25ELSEW(K-21)=W(K-21)-10:BB=BB-1
34 Z=USR(900):RESET(6*AA-4,3*BB):RESET(6*AA-3,3*BB):RESET(6*AA-2
,3*BB):RESET(6*AA-1,3*BB):GOTO17
35 AA=RND(21):BB=RND(13)
36 IFW(AA+21*(BB-1))>0THEN35
37 C=C+1:GOTO17

   Line 38: Let the player examine the maze for a while, then
       initialize score.

38 PRINTTAB(24)"THE MAZE IS READY";:FORI=1TO5000:NEXT:S=1000:CLS
:PRINT@896,"DRAGON MAZE"TAB(51)"SCORE : 1000";

   Line 39: Draw the outline of the maze.

39 PRINT@0,STRING$(64,131);:PRINT@832,STRING$(64,131);:FORZ=0TO7
68STEP64:PRINT@Z,CHR$(191);:PRINT@Z+63,CHR$(191);:NEXT

   Lines 40-45: Initialize the starting position of player and
       monster and draw them.

40 AA=1:BB=RND(13):SET(2,BB*3-2):SET(3,BB*3-2):SET(4,BB*3-2):SET
(5,BB*3-2):SET(2,BB*3-1):SET(3,BB*3-1):SET(4,BB*3-1):SET(5,BB*3-
1)
41 Q=6*AA-4:P=3*BB-2
42 WY=RND(13)
43 RESET(126,3*WY-2):RESET(127,3*WY-2):RESET(126,3*WY-1):RESET(1
27,3*WY-1)
44 JJ=21:KK=WY
45 QX=6*JJ-4:QY=3*KK-2

   Line 46: Start of game loop.  Checks if monster is in same
       location as player.

46 IFJJ=AAANDKK=BBTHEN100ELSEPRINT@984,"ENTER DIRECTION ? ";

   LIne 47: Get player's move.

47 A$=INKEY$:IFA$=""THEN47ELSEIFA$>="A"ANDA$<="Z"PRINTA$;

   Line 48: Call the routine to move the monster.

48 GOSUB83

   Line 49: Check if monster just moved where you are.

49 IFJJ=AAANDKK=BBTHEN100
```

```
   Lines 50-53: Go to the routines for up, down, right and
      left.

50 IFA$="R"ORA$=CHR$(9)THENPRINT"R";:GOTO55
51 IFA$="L"ORA$=CHR$(8)THENPRINT"L";:GOTO64
52 IFA$="U"ORA$=CHR$(91)THENPRINT"U";:GOTO68
53 IFA$="D"ORA$=CHR$(10)THENPRINT"D";:GOTO72

   Line 54: Player hit invalid key, so call routine to sub-
      tract from score and make sound.

54 GOSUB79:GOTO46

   Lines 55-63: Move-player-right-routine.  If he hit a
      wall, go to the routine to draw the wall.

55 O1=2:O2=0
56 IFRIGHT$(STR$(W(AA+21*(BB-1))),1)="1"THEN75
57 E=6*AA-4:F=3*BB-2:FORI=1TO3
58 E=E+O1:F=F+O2




59 FORK=0TO3:FORZ2=0TO1:RESET(Q+K,P+Z2):NEXTZ2,K:FORK=0TO3:FORZ2
=0TO1:SET(E+K,F+Z2):NEXTZ2,K:Q=E:P=F
60 NEXTI
61 AA=AA+O1/2:BB=BB+O2
62 IFAA=21ANDBB=WYTHEN80
63 GOTO46

   Lines 64-67: Move-player-left-routine.

64 O1=-2:O2=0
65 IFAA=1THEN76
66 IFRIGHT$(STR$(W(AA+21*(BB-1)-1)),1)="1"THEN76
67 GOTO57

   Lines 68-71: Move-player-up-routine.

68 O1=0:O2=-1
69 IFBB=1THEN77
70 IFFIX(W(AA+21*(BB-2))/10)=-1THEN77
71 GOTO57

   Lines 72-74: Move-player-down-routine.

72 O1=0:O2=1
73 IFFIX(W(AA+21*(BB-1))/10)=-1THEN78
74 GOTO57

   Lines 75-78: The four routines that draw the wall when hit.

75 GOSUB79:Y1=3*BB-3:Y2=3*BB:X1=AA*6:GOSUB101:X1=X1+1:GOSUB101:G
OTO46
76 GOSUB79:Y1=3*BB-3:Y2=3*BB:X1=6*AA-6:GOSUB101:X1=X1+1:GOSUB101
:GOTO46
77 GOSUB79:X1=6*AA-6:X2=6*AA+1:Y1=3*BB-3:GOSUB102:GOTO46
78 GOSUB79:X1=6*AA-6:X2=6*AA+1:Y1=3*BB:GOSUB102:GOTO46

   Line 79: Make some sound and subtract from player's score.

79 FORZ=775TO900:I=USR(Z):NEXT:S=S-1:PRINT@954,S;:RETURN

   Line 80: Routine for player won.

80 PRINT@960,;:PRINTTAB(28)"YOU WIN"TAB(62);:AA=USR(0):AA=USR(0)
:AA=USR(0)

   Lines 81-82: Prompt player for next game.

81 PRINT@916,"PRESS ENTER TO PLAY AGAIN";
82 A$=INKEY$:IFA$<>CHR$(13)THEN82ELSERUN

   Lines 83-99: Routine to move monster.

83 IFAA>JJTHEN85ELSEIFBB>KKTHEN94
84 IFAA<JJTHEN96ELSEIFBB<KKTHEN98
85 IFJJ=21THEN94ELSEIFT(JJ+21*(KK-1))>9THEN86ELSEIFRIGHT$(STR$(W
(JJ+21*(KK-1))),1)="1"THEN94
86 O1=2:O2=0
87 RX=6*JJ-4:RY=3*KK-2
88 FORI=1TO3:RX=RX+O1:RY=RY+O2
89 FORK=0TO3:FORZ2=0TO1:RESET(QX+K,QY+Z2):NEXTZ2,K:FORK=0TO3:FOR
Z2=0TO1:SET(RX+K,RY+Z2):NEXTZ2,K:QX=RX:QY=RY
90 NEXTI
91 JJ=JJ+O1/2:KK=KK+O2
92 T(JJ+21*(KK-1))=T(JJ+21*(KK-1))+1
93 RETURN
94 IFKK=21THEN96ELSEIFT(JJ+21*(KK-1))>9THEN95ELSEIFFIX(W(JJ+21*(
KK-1))/10)=-1THEN96
95 O1=0:O2=1:GOTO87
96 IFJJ=1THEN98ELSEIFT(JJ+21*(KK-1))>9THEN97ELSEIFRIGHT$(STR$(W(
JJ+21*(KK-1)-1)),1)="1"THEN98
97 O1=-2:O2=0:GOTO87
98 IFKK=1THEN85ELSEIFT(JJ+21*(KK-1))!9THEN99ELSEIFFIX(W(JJ+21*(K
K-2))/10)=-1THEN85
99 O1=0:O2=-1:GOTO87

   Line 100: Routine for player lost.

100 FORZ=10050TO10150:I=USR(Z):NEXT:PRINT@960,;:PRINTTAB(23)"THE
 DRAGON GOT YOU !!!";:S=1:GOSUB79:GOTO81

   Line 101: Routine to draw a vertical line.

101 FORYY=Y1TOY2:SET(X1,YY):NEXT:RETURN

   Line 102: Routine to draw a horizontal line.

102 FORXX=X1TOX2:SET(XX,Y1):NEXT:RETURN
```

An S-80 One Liner

```
1 CLEAR 195:R=RND(159)+32:A$=STRING$(64,R):FOR X=0 TO 1023 STEP
64:PRINT@X,A$;:NEXT X:S=RND(159)+32:C$=STRING$(64,S):FOR X=960 T
O 0 STEP -64:PRINT@X,C$;:NEXT X:RUN
```

Joe Hilman
Crowley, Texas

An S-80 One Liner

```
1 CLS:PRINT CHR$(23):FOR P=15360 TO 16383 STEP RND(79):POKE P,RN
D(94):NEXT P:CLS:FOR P=16383 TO 15360 STEP -RND(79):POKE P,RND(9
4):NEXT P:GOTO 1
```

Shane Causer
Brunswick, Georgia

TRS-80 LEVEL II

Board Games-1, CS-3001 (16K)

• Mugwump $7.95

Mugwump is a board game which uses a 10x10 grid on which four friendly Mugwumps are hiding. Your mission is to locate these mysterious animals and capture them.

• Flip Disc

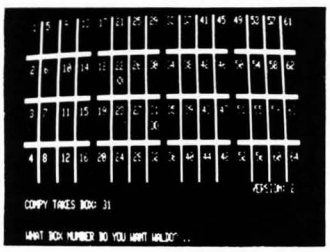
Are you an Othello freak? Flip Disc is a program which will turn your computer into an excellent opponent. Three different skill levels, (good, expert, and genius), provide an introduction for the novice and continuing interest for the experienced player.

• Wumpus

In game 1, you scour a network of underground caves in search of the prized Wumpus. Bagging a Wumpus wins the game, but if you accidentally stumble into his cave, the Wumpus will enjoy a tasty dinner of sauteed computer freak.

• Wumpus 2

If you master the dodecahedron cave network in Wumpus 1, you may proceed to Wumpus 2 which allows you to choose from five different caves, or you can design your own.



• Qubic

Qubic is a three dimensional Tic Tac Toe game. The game is played in a 3 dimensional cube (4x4x4). The object is to outwit the computer and place four pieces in any straight line.

• Backgammon

This is the TRS-80 adaptation of the popular board game. Backgammon uses graphics and all the standard backgammon rules, not a strange computer variation. The computer is your opponent in this version, written by Scott Adams of "Adventure" fame.

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• Ultra-Trek $7.95

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• Star Lanes

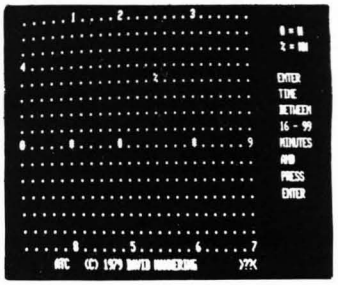
Imagine yourself the president of an intergalactic shipping company. If you're successful, you may be named Imperial Advisor on Economic Affairs. Entrepreneurs: to your ships.

• Star Wars

If you hate Darth Vader, you'll love Star Wars. This real time game is fun for aliens of all ages. May the Force be with you!

• Romulan

Your mission is to destroy an invading Romulan space craft. Maneuver through space and around stars looking for the deadly enemy, but be careful! The nasty Romulans fire back.



Air Traffic Controller, CS-3006 (16K) $7.95

This real time machine language program puts you in the chair of an air traffic controller. There are 27 airplanes — jets and prop planes — which must be controlled as they land, take off and fly over your air space. You give the orders to change altitude, turn, maintain a holding pattern, clear for approach, and land at your two airports. This realistic simulation includes navigational beacons, and requires planes to take off and land into the wind. Air Traffic Controller was written by an air traffic controller and is a favorite of the Creative Computing staff!

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- **Evasion**

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- **Jigsaw**

Jigsaw is a computer-age puzzle game making extensive use of TRS-80 graphics. The computer generates a random puzzle and puzzle board. Using a combination of deductive reasoning and luck you must fit the graphically represented puzzle piece into place.

- **The Masters**

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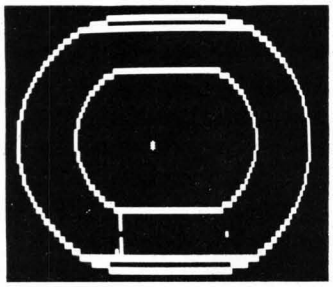

- **Motor Racing**

Motor Racing combines real time racing action with advanced graphics functions. The graphics and animation make Motor Racing fun to watch as well as play.

Pursuit Games, CS-3004 (16K)

- **Stock Car Race** $7.95

Stock Car Race is a real time racing game on a road race circuit.

- **Maze**

You are timed throughout your run and rated on the basis of elapsed time and the number of moves required to escape. Nine skill levels.

- **Indy Racer**

Indy Racer is a real time racing game for the TRS-80. Similar to the popular arcade-style driving games.

- **Depth Charge**

As commander of a destroyer, your mission is to destroy as many enemy subs as possible in this re-creation of the Battle of the Atlantic.

- **Kaleidoscope**

This graphics demonstration program turns your TRS-80 into a computer age kaleidoscope.

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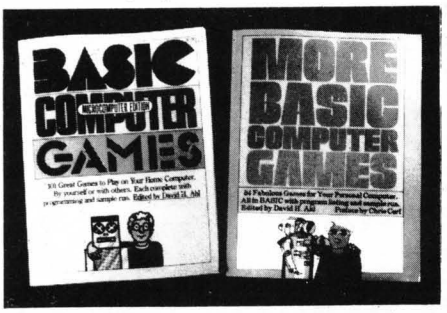

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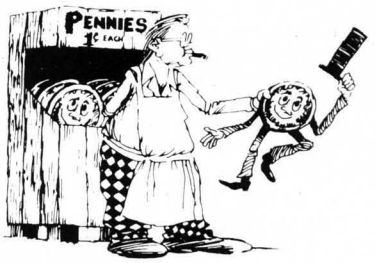

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OCTADRAW

This program is designed for an Atari with 8K and at least one joystick.

by James Garon

The other day I was happily engrossed in the wonders of Atari's Video Easel cartridge, when it occurred to me that it might be fun to write my own drawing program. One of the most fascinating things about the cartridge was the "quad" mode in which everything drawn is repeated in four-fold symmetry. I decided to improve on this and create eight-fold symmetry (hence the name, OCTADRAW).

RUN the program, then press the START button at the right of the keyboard. You will see a blinking cursor in the center of the screen. Using the joystick in slot #1, you may move the cursor around the screen. With the fire-button pressed, the cursor will leave a trail of color as it moves. Seven mirror images of the line will also appear, three will match the cursor color, and four will be a different color.

Pressing the SELECT button (just above START at the right of the keyboard) will select the computer to do the drawing, while you sit back and watch. When you wish to continue drawing, just move joystick #1 and hold it until the computer finishes the line it is currently drawing. You may then add to the computer's drawing.

Pressing the button with the word CLEAR on it will erase the current picture no matter who was drawing.

If a joystick is placed in slot #2, you can control the colors that OCTADRAW uses. Pressing forward will change the background color; pressing left changes one of the drawing colors while pressing right changes the other. Holding the fire-button down during any of these three operations will change not the color but the luminance of the corresponding color. With eight shades of 16 colors for each of the three parts of the drawing, there are over two million possible color combinations!

VARIABLES USED

A=32: Added to x-value to center drawing

C=3: COLOR value

H1, H2, H4: Colors used in SETCOLOR x,Hx,Ly statements

I: Loop variable

KEY=764: PEEK address to determine which key has been pressed

L: Used in line 10 to create mixed mode display

Used in line 820 to determine length of line to be drawn by the computer

L1, L2, L4: Luminances used in SETCOLOR x,Hx,Ly statements

P=95: Used to calculate reflections across X-axis

Q=127: Used to calculate reflections across Y-axis

S: In line 100 S is the value of STICK(0). This determines the direction in which the cursor will move.

In line 800, the computer "makes up" a value for S, and this value determines the direction of cursor movement.

START=53279: PEEKing at this location reveals which of the START, SELECT, or OPTION buttons are pressed.

T: In line 500, T gives the status of the fire-button: 0 if pressed, 1 if not. This determines whether a line will be drawn or not.

Similarly, in lines 800 and 810 the computer "pretends" to press the fire-button about 9/10ths of the time. You may change this fraction by changing "0.1" in line 810 to some other fraction between 0 and 1.

V: Reflects any activity from joystick #2. This changes the colors of the drawing.

W: Tests for the fire-button on joystick #2. This affects the brightness of the colors.

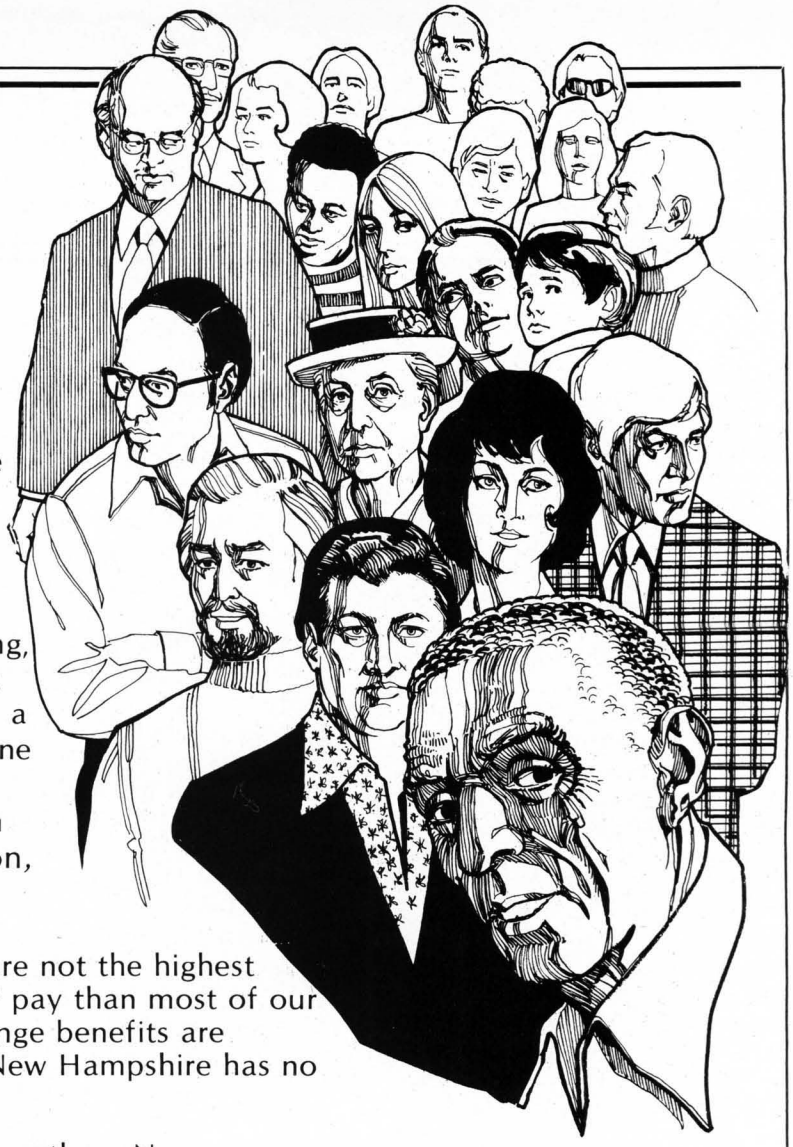
X,Y: The coordinates of the point to be PLOTted

Z: Temporary storage used when X and Y are switched at the end of the drawing subroutine in line 900

```
  Lines 10-20: Clear screen; turn off
  cursor; set address (L) of display
  list for mixed graphic mode title
  page; print title page.
10 GRAPHICS 0:POKE 752,1:L=6+PEEK(741)+2
56*PEEK(742):POSITION 3,4:? "oCtA-dRaW":
POSITION 23,4:? "BY JAMES GARON"
20 POSITION 6,9:? "Press START"
  Line 30: Set colors for title page;
  change fourth line to GRAPHICS 2
  (Giant letters) and fifth line to
  GRAPHICS 1 (MEDIUM letters). Define
  KEY and START locations.
30 SETCOLOR 2,2,4:SETCOLOR 4,2,4:SETCOLO
R 0,2,8:POKE L+4,7:POKE L+5,6:KEY=764:ST
ART=53279
  Line 40: Wait until START button is
  pressed.
40 IF PEEK(START)=7 THEN 40
  Line 50: X and Y are the coordinates
  of the cursor - place it in the cen-
  ter of the screen (47,47); select full
  screen graphics mode 7+16; C=3 used
  in later COLOR commands; H1, H2, H4
  are initial hues; L1, L2, L4 are
  luminances of the background and the 2
  drawing colors. A is the offset used
  to center the picture in the X direc-
  tion; P and Q are used to reflect the
  drawing across the X-axis, Y-axis and
  the two diagonals.
50 X=47:Y=X:GRAPHICS 23:C=3:H1=12:L1=8:H
2=L1:L2=2:H4=L2:L4=H2:GOSUB 700:A=32:P=9
5:Q=127
  Line 100: Get status of joystick #1
  (S); check for SELECT button (START
  actually reflects the status of the
  START, SELECT, and OPTION buttons by
  returning a 6, 5, and 3 respectively;
  if none are pressed START will con-
  tain a 7.) If SELECT is pressed, let
  the computer take over at line 800
100 S=STICK(0):GOSUB 500:IF PEEK(START)=
5 THEN 800
110 GOTO 100
  Lines 500-580: Move cursor in re-
  sponse to motions of joystick #1;
  Line 500 blinks the cursor by alter-
  nating the current color (C=3) with
  color 1 (set to black in line 700).
  Check for fire button (T=0 if
  pressed).
500 PLOT X+A,Y:COLOR 1:PLOT X+A,Y:T=STRI
G(0)
  Line 520: If button is pressed, then
  C-C*T will equal C (which is 3), and
  we draw in COLOR 3; otherwise (T=1),
  C-C*T will be zero so we won't draw
  as the cursor moves. Subroutine 900
  draws four of the eight lines and
  swaps X with Y in preparation for
  drawing the other four, which are
  drawn (if T=0) in COLOR 2.
520 COLOR C-C*T:GOSUB 900:COLOR 2-T-T:GO
SUB 900
  Line 540: Here, we see if the CLEAR
  key has been pressed (actually, the
  "<" key). If so, we clear the screen,
  re-center the cursor and jump to line
  700 which preserves any color changes
  that have been made.
540 IF PEEK(KEY)=54 THEN POKE KEY,0:GRAP
HICS 23:X=47:Y=X:GOTO 700
  Lines 550-580: Takes care of movement
  in all eight directions. Line 550
  checks for an even number from Joy-
  stick #1 (S); this indicates that the
  stick is pressed forward (possibly di-
  agonally). The cursor is then moved
```

continued on page 68

Positions Available!



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While New Hampshire wages are not the highest around, we offer a better scale of pay than most of our competitors. Furthermore, our fringe benefits are excellent. Another bonus is that New Hampshire has no personal income tax or sales tax.

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If you are a hard-working, skilled person with experience in the fields of computing and magazines, and if you enjoy the relaxed country lifestyle with the convenience and cultural opportunities of major urban centers nearby, drop us a line. We might be good for each other.

If you don't fit any of the aforementioned descriptions, don't despair. You might have a skill we could use. If you think that is the case, please contact us. A formal resume isn't necessary, just send a letter describing your skills, qualifications, and experience to:

George Blank,
P.O. Box 68,
Milford, N.H. 03055
re: Personnel Department

INTERNA- MAZE

INTERNA-MAZE is for a 16K Apple with Integer Basic.

by Dennis Ward

Here's a maze with a unique point of view: worm's-eye. Rather than the usual view from above, Interna-Maze lets the user try to escape from the maze by trial and error, with the perspective of one actually inside the maze itself. The user can elect to leave footprints to show direction in which he is facing, or employ an aerial view map of the maze with color differentiation to show where he has been. Furthermore, Interna-Maze lets the user select from ten levels of difficulty, providing anyone from the novice to the homing pigeon with a challenge.

VARIABLES
(in order of occurrence)

The variables described as "Boolean" simply have a value of 1 for yes, 2 for no.

- G$ General input string
- H$ Compass directions ("North East South West")
- C(K) Array [0 to 3121] of map positions
  If C(K) = 0 then you can't go there (color = black)
  If C(K) = 1 then you've already been there (color = red)
  If C(K) = 3 then it is part of the maze (color = violet)
- F Which foot you step with (−1 is left, +1 is right)
- MC Map color (constant; = 3) (see C)
- TC Trail color (constant; = 1) (see C)
- FTS Boolean input; "has selected footsteps option?"
- MAP Boolean input; "has selected map option?"
- COMP Boolean input; "has selected compass option?"
- DIR Direction of travel (1 = North, 2 = East, 3 = South, 4 = West)
- A Random Integer (0 − 18) used to compute X for plotting
- B Random Integer (0 − 18) used to compute Y for plotting
- X Horizontal position for plotting (1 − 37) (= A*2 + 1)
- Y Vertical position for plotting (1 − 37) (= B*2 + 1)
- SC Score (initialized at 360; termination at 0)
- S Input; Level of Difficulty; determines maze complexity
- L Boolean; "can go left?" also, in lines 1570-1630, random index to one of 4 corners in finding starting point.
- R Boolean; "can go right?"
- U Boolean; "can go up?"
- D Boolean; "can go down?"
- I lines 300-470 temporary counter variable
  lines 490-750 tells how far away turn is (0-5)
  lines 770-1150 counter to look "I" spaces away
- Q Temporary counter variable for plotting
- IN Same as Q
- Z ASCII code of keyboard input
- TX Temporary horizontal pointer to keep track where you look from
- TY Same as TX, but is the vertical pointer
- K A computed variable; for every possible TX, TY K is unique
- XX Constant; horizontal pointer (Remember where you are) also used to produce a tone variable (0-216)
- YY Constant; vertical pointer (Remember where you are)
- E temporary horizontal pointer
- G temporary vertical pointer
- QWQ Temporary variable; line number for gosub

```
]LIST
    2 REM **  INTERNA-MAZE          **
    4 REM **   DENNIS WARD          **
    6 REM **  WRITTEN JULY,1979     **
   90 REM
       DIMENSION VARIABLES
  100 DIM G$(4),H$(21),C(3121):F=
      1
  110 GOTO 1440
  120 REM
       DRAW MAZE
  130 GR :MC=3
  140 COLOR=3:A= RND (19):B= RND
      (19):X=A*2+1:Y=B*2+1: PLOT
      X,Y:SC=360
  150 IF RND (100)<S*3 THEN 260
  160 L=0: IF A<1 THEN 170: IF SCRN(
      X-2,Y)=0 THEN L=1
  170 R=0: IF A>17 THEN 180: IF SCRN(
      X+2,Y)=0 THEN R=1
  180 U=0: IF B<1 THEN 190: IF SCRN(
      X,Y-2)=0 THEN U=1
  190 D=0: IF B>17 THEN 200: IF SCRN(
      X,Y+2)=0 THEN D=1
  200 IF L+R+U+D=0 THEN 260
  210 GOTO 220+( RND (4)*10)
  220 IF L=0 THEN 210:A=A-1:X=X-2
      :SC=SC-1: HLIN X,X+1 AT Y: GOTO
      150
  230 IF R=0 THEN 210:A=A+1:X=X+2
      :SC=SC-1: HLIN X-1,X AT Y: GOTO
      150
  240 IF U=0 THEN 210:B=B-1:Y=Y-2
      :SC=SC-1: VLIN Y,Y+1 AT X: GOTO
      150
  250 IF D=0 THEN 210:B=B+1:Y=Y+2
      :SC=SC-1: VLIN Y-1,Y AT X: GOTO
      150
  260 IF SC=0 THEN 1550
  270 A= RND (19):B= RND (19):X=A*
      2+1:Y=B*2+1: IF SCRN(X,Y)=0
       THEN 270: GOTO 160
  280 RETURN
  290 REM
       DRAW CEILING
  300 COLOR=7: FOR I=1 TO 18
  310 HLIN 19-I,19+I AT 19-I
  320 NEXT I
  330 REM
       DRAW FLOOR
  340 COLOR=6
  350 FOR I=1 TO 19
  360 HLIN 20-I,18+I AT 18+I
  370 NEXT I
  380 REM
       DRAW WALLS
  390 COLOR=12
  400 FOR I=1 TO 18
  410 REM
       LEFT WALL
  420 VLIN 19-I,18+I AT 19-I
  430 REM
       RIGHT WALL
  440 VLIN 19-I,18+I AT 19+I
  450 NEXT I
  460 GOSUB 1230: IF MAP#1 THEN 470
      : CALL -936: GOSUB 1230: PRINT
      "PUSH 'M' FOR MAP"
  470 RETURN
  480 REM
       MAKE RIGHT TURN
  490 GOTO 500+I*10
  500 FOR Q=1 TO 5: COLOR=4: VLIN
      Q,38-Q AT 38-Q: COLOR=7: HLIN
      37-Q,37 AT Q: COLOR=6: HLIN
      37-Q,37 AT 38-Q: NEXT Q: RETURN
  510 FOR Q=6 TO 10: COLOR=4: VLIN
      Q,38-Q AT 38-Q: COLOR=7: HLIN
```

continued on page 64

MOONLANDING

MOONLANDING is written in Applesoft and requires at least 16K.

by Herb Sandy

You are in command of the 'Eagle' lunar lander! Select the minimum acceptable landing spot size, and the craft's onboard guidance system will find and bring you within a reasonable distance of a landing spot within your specifications. From there you must control the ship manually. The main rocket is controlled by paddle one while the side thrusters are controlled by paddle zero. A word of caution — you must land at a horizontal and vertical speed of ten or less.

A$ - Used to accept keyboard entries.

T% - Thrust, a number from 1 to 7, represents the rocket thrust being applied.

SI% - Landing spot size.

H - Horizontal speed.

V - Vertical speed.

X, Y - Lander's position on the screen

F% - Fuel remaining

G1, J, J8, B, P - Loop index variables.

R, T - Used to hold paddle values.

R% - Direction of horizontal thrust.

X1 - Variable used to compute horizontal speed.

Y1 - Variable used to compute vertical speed.

B3 - Landing spot y-coordinate.

B2 - Center point x-coordinate of landing spot.

B1 - Y-coordinate used in plotting random moon surface.

```
2  REM  *   MOON LANDING   *
4  REM  *        BY        *
6  REM  *    HERB SANDY    *
8  REM  *    (C) 1980      *
 Title and jump to subroutine that
 pokes in machine language.

100  HOME : VTAB 11: HTAB 16: FLASH
     : PRINT "MOON";: NORMAL : PRINT
     " ";: FLASH : PRINT "LANDING
     ": NORMAL
120  GOSUB 5000

 Clear hi-res screen from last run,
 return to text screen.

1000  HGR : TEXT

 Input the size of the landing spot.

1020  HOME :T% = 1: VTAB 12: INPUT
     "INPUT LANDING SPOT SIZE (15
     -100) ";SI%
1030  IF SI% < 15 OR SI% > 100 THEN
     1020
1035  VTAB 20: PRINT "        ONE
      MOMENT PLEASE"

 Jump to subroutine to draw random
 moon surface.

1038  HCOLOR= 3: GOSUB 1800

 Initialize variables.

1100 H = 10:V = 4:A = 300:X = 20:
     Y = 20:F% = 20000

 Set up bottom four lines of screen.

1120  VTAB 23: PRINT "VERT. SPEED
     =";: PRINT "      HORIZ. SP
     EED ="
1140  PRINT : PRINT "FUEL ";: PRINT
     "          ALTITUDE = "
1180  HCOLOR= 3

 Draw lander and related shapes at
 x,y coordinates.

1200  SCALE= 1: HCOLOR= 3: ROT= 0
     : DRAW 1 AT X,Y

1220  IF T% > 1 THEN  FOR G1 = 1 TO
     T%: HCOLOR= 5: DRAW 2 AT X,Y
      + 3 * G1: NEXT

1222  IF T% > 1 AND R% = 54 THEN
      HCOLOR= 3: FOR G1 = 1 TO T%
     : HPLOT X + 8 + G1 * 1.8,Y -
     1: NEXT
1224  IF T% > 1 AND R% = 10 THEN
      HCOLOR= 3: FOR G1 = 1 TO T%
     : HPLOT X - 8 - G1 * 1.8,Y -
     1: NEXT

 Make some noise.

1240  POKE 7623, ABS (200 - Y): POKE
     7624,10: CALL 7625: IF T% >
     1 THEN  FOR Y8 = 1 TO 6 * T%
     : CALL 7648: NEXT

 Check proximity of moon surface.

1260  IF Y > ( PEEK (7912 + X)) -
     6 THEN  GOSUB 2000

 Black out lander and related
 shapes.

1265  IF T% > 1 AND R% = 54 THEN
      HCOLOR= 0: FOR G1 = 1 TO T%
     : HPLOT X + 8 + G1 * 1.8,Y -
     1: NEXT : GOTO 1280
1268  IF T% > 1 AND R% = 10 THEN
      HCOLOR= 0: FOR G1 = 1 TO T%
     : HPLOT X - 8 - G1 * 1.8,Y -
     1: NEXT
1280  SCALE= 1: HCOLOR= 0: ROT= 0
     : DRAW 1 AT X,Y
1300  FOR G1 = 1 TO T%: HCOLOR= 0
     : DRAW 2 AT X,Y + 3 * G1: NEXT

 Redraw the landing spot if the
 lander is close to the surface.

1320  IF Y > ( PEEK (7912 + X)) -
     20 THEN  HCOLOR= 3: HPLOT B2
      - SI% / 2,B3 TO B2 + SI% /
     2,B3

 Jump to subroutine to print present
 status.

1340  GOSUB 1680
```

```
 Get paddle values.

1360  IF F% > 1 THEN T =  PDL (1)
     :T% = T / 35: SCALE= T%: IF
     T% = 0 THEN T% = 1
1380 R =  PDL (0): IF R < 70 THEN
     R% = 10: GOTO 1440
1400  IF R > 130 THEN R% = 54: GOTO
     1440
1420 R% = 0

 Jump to subroutine to compute next
 position on the screen, then go
 back to main loop at 1200.

1440  GOSUB 1580:X = X + H:Y = Y +
     V: IF Y <  = 11 THEN Y = 11
1460  IF X < 21 THEN X = 21
1480  IF X > 259 THEN X = 259
1560  GOTO 1200

 Subroutine to compute next position
 of lander.

1580  IF R% = 0 THEN X1 = 0:Y1 =
      - .5: GOTO 1640
1600  IF R% = 10 THEN X1 = .8:Y1 =
      - .5: GOTO 1640
1620  IF R% = 54 THEN X1 =  - .8:
     Y1 =  - .5: GOTO 1640
1640 H = H + (T% * X1 / 3.5):V =
     V + (T% * Y1 / 3.5) + .42857
     1429: RETURN

 Subroutine to print present status.

1680  VTAB (21): POKE 36,13: PRINT
      INT (V * 10);" ";
1700  VTAB (21): POKE 36,34: IF H
     > 0 THEN  PRINT ">"; INT (H
      * 10);" ": GOTO 1740
1720  PRINT "<"; ABS ( INT (H * 1
     0));" "
1740  VTAB (23): POKE 36,5: PRINT
     F%;"   ";:F% = F% - 40 * (T%
      - 1): IF F% <  = 1 THEN T% =
     1:F% = 0
1760  VTAB (23): POKE 36,25: PRINT
      INT (B3 - Y - 5);" ";
1780  RETURN

 Subroutine to draw random moon
 surface.

1800 B2 =  INT ( RND (1) * 280): IF
     B2 < SI% / 2 + 2 OR B2 > 279
      - SI% / 2 - 2 THEN 1800
1820 B3 = 159 - ( INT ( RND (1) *
     30))
1840  FOR J = B2 - SI% / 2 TO B2 +
     SI% / 2: HPLOT J,B3: POKE 79
     12 + J,B3: NEXT
1860 B1 = B3
1880  FOR J = B2 - SI% / 2 - 1 TO
     0 STEP  - 1: GOSUB 1940: NEXT

1900 B1 = B3
1920  FOR J = B2 + SI% / 2 + 1 TO
     279: GOSUB 1940: NEXT : POKE
      - 16304,0: RETURN
1940  IF  RND (1) > .6 THEN B1 =
     B1 + 1.3: GOTO 1980
1960 B1 = B1 - 1.3
1980  HPLOT J,B1: POKE 7912 + J,B
     1: RETURN

 Check to see if successful landing
 was made.

2000  IF V < 1 AND X > B2 - SI% /
     2 + 3 AND X < B2 + SI% / 2 -
     3 THEN  GOTO 2060

 Unsuccessful landing, black out
 lander, jump to explosion
 subroutine, jump to ending.

2020  HCOLOR= 0: DRAW 1 AT X,Y: GOSUB
     6510
2033  FOR J8 = 1 TO 2000: NEXT
2035  TEXT : HOME : VTAB 10: PRINT
     "YOU HAVE JUST DESTROYED A F
     IFTY MILLION DOLLAR SPACECRA
     FT!! "
2040  GOTO 10000

 Successful landing, draw lander on
 surface, rate player as pilot, jump
 to ending.

2060  FOR G1 = 1 TO T%: HCOLOR= 0
     : DRAW 2 AT X,Y + 3 * G1: NEXT
     : FOR B = 1 TO 3000: NEXT
2062  TEXT : HOME : VTAB 10: PRINT
     "THE EAGLE HAS LANDED. CONGR
     ATULATIONS!!"
2063  PRINT : PRINT "YOUR RATING
     AS A PILOT IS "; INT ((F% /
     500) * (10 - V) * ((101 - SI
     %) / 20 + 1))
2070  GOTO 10000

 Subroutine to poke shape table and
 sound subroutine into memory.

 5000  FOR P = 7424 TO 7666: READ
      N: POKE P,N: NEXT
 5005  POKE 232,0: POKE 233,29
 5010  DATA  5,0,12,0,84,0,91,0,9
      3,0,133,0
 5020  DATA 45,45,45,54,54,46,39,6
      0,28,36,63,63,63,63,63,54,54
      ,62,37,44,12,36,39,45,45,45,
      45,45,60,63,63,63,63,63,40,4
      5,45,45,45,45
 5030  DATA  37,63,63,63,63,63,63,
      44,45,45,45,45,45,229,255,59
      ,255,59,12,45,13,13,45,28,63
      ,63,63,12,45,45,6,0
 5040  DATA 18,12,31,28,77,57,0
 5050  DATA  7,0
 5051  DATA  99,177,223,63,1,32,12
      ,104,13,21,182,183,109,28,12
      ,228,100,28,223,223,31,254,5
      0,174,254,142,42,44,85,41,77
      ,109,5,40,56,32
 5052  DATA  44,32,0
 5054  DATA  219,219,219,219,219,2
      19,27,5,32,193,193,32,53,69,
      65,32,63,73,65,65,37,77,9,77
      ,73,13,13,21,141,141,50,109,
      137,18,150,146
 5055  DATA  18,86,49,150,18,54,15
      0,26,183,146,223,250,219,27,
      63,255,219,219,59,223,31,31,
      223,27,32,32,3,96,67,5,0
 5060  DATA 0,0,173,48,192,136,208
      ,5,206,200,29,240,9,202,208,
      245,174,199,29,76,201,29,96,
      215,203,173,48,192,232,236,2
      22,29,240,29,76,242,29,200,2
      04,223,29,240,238,96

   Explosion subroutine.

6510  HCOLOR= 3: DRAW 4 AT X,Y -
     3: FOR B = 1 TO 40: NEXT : HCOLOR=
0: DRAW 4 AT X,Y - 3
6520  HCOLOR= 3: DRAW 5 AT X,Y -
    17: FOR B = 1 TO 40: NEXT : HCOLOR=
 0: DRAW 5 AT X,Y - 17
6530  SCALE= 2: HCOLOR= 3: DRAW 5
      AT X,Y - 34: FOR B = 1 TO 4
     0: NEXT : HCOLOR= 0: DRAW 5 AT
     X,Y - 34: SCALE= 1: RETURN

 Ending routine.
 ...

10000  VTAB 20: HTAB 1: PRINT "PL
     AY AGAIN ?  (Y OR N)";: GET
     A$
10005  IF A$ = "Y" THEN 1000
10010  IF A$ <  > "N" THEN 10000
10100  HOME : END
```

EARTH–PORT II

EARTHPORT II is an S-80 program requiring 16K.

by Phillip Case

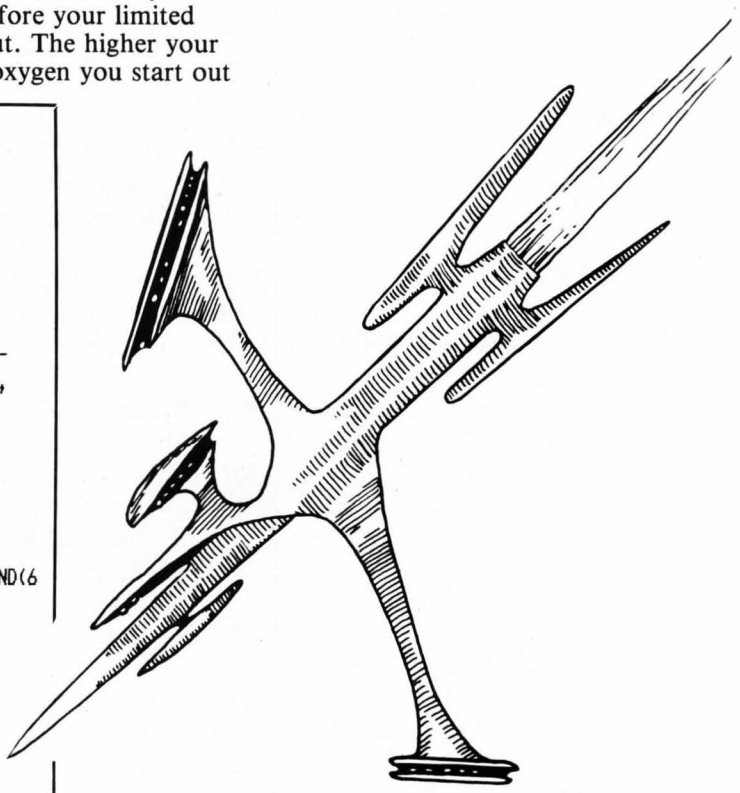
When this simulation begins, you will find yourself at the controls of a real-time spaceship lander. In the initial phase of the game you enter your military rank. The higher your rank, the harder it is to safely land at the spaceport.

You control the motion of your ship by the use of the four arrow-keys. For instance: To reduce your downward momentum, depress the up-arrow. This program will respond to two keys pressed at the same time, i.e. the down and left arrows together.

Once you safely guide your ship to within a certain proximity of the landing pad, your on-board computer will automatically switch your view screen to your close-up scanner.

Your goal is to land safely in the landing bay before your limited oxygen runs out. The higher your rank, the less oxygen you start out with. Also, upon a successful landing, you will be scored for your flight performance. Your score is based on the amount of remaining oxygen and your rank. Caution: The higher your rank, the greater your initial momentum. At a rank of General, you have only seconds to prevent a fatal crash into the alien mountainside.

```
0 '*********************************
  *         EARTH-PORT II         *
  *-------------------------------*
  *      (C) COPYRIGHT 1980       *
  *-------------------------------*
  * BY WILLIAM PHILLIP CASE, JR. *
1 '*********************************

    Lines 3-4: Clears memory, screen, sets variables to int-
         eger for speed, displays title, and builds A$, B$,
         and C$ which are used in the destruction routine.

3 CLEAR1000:CLS:DEFINTA,X-Y:PRINTCHR$(23);"


        EARTH-PORT II"
4 CLEAR1000:FORX=1TO128:B$=B$+CHR$(RND(60)+130):A$=A$+CHR$(RND(6
0)+130):C$=C$+CHR$(RND(60)+130):NEXT

    Line 5: Inputs rank.

5 CLS:INPUT"ENTER YOUR RANK:

       1. PRIVATE FIRST CLASS
       2. CORPORAL
       3. CAPTAIN
       4. MAJOR
       5. COLONEL
       6. GENERAL";SL:CLS:IFSL<1ORSL>6THEN5

    Lines 20-30: Creates outlines and displays rank on screen.

20 FORX=0TO127:SET(X,38):SET(X,0):SET(X,47):NEXT:FORY=0TO47:SET(
0,Y):SET(1,Y):SET(126,Y):SET(127,Y):NEXT:FORY=39TO46:SET(38,Y):S
ET(39,Y):SET(69,Y):SET(68,Y):NEXT:PRINT@877,"RANK:";:ONSLGOTO21,
22,23,24,25,26
21 R$="PRIVATE FIRST CLASS":GOTO30
22 R$="      CORPORAL":GOTO30
23 R$="      CAPTAIN":GOTO30
24 R$="       MAJOR":GOTO30
25 R$="      COLONEL":GOTO30
26 R$="      GENERAL":GOTO30
30 PRINT@934,R$;
```



```
    Lines 35-45: Sets variables for primary approach, then
         branches to that routine at line 11000.

35 X1=54:Y1=32
40 HS=SL*2:VS=-SL:O=30+(60-(SL*10)):X=10:Y=10
45 GOSUB11000: ' PERFORM PRIMARY APPROACH ROUTINE

    lines 46-51: After successfully approaching the landing
         bay, this routine puts the close-up view on the
         screen.

46 PRINT@769,STRING$(60,191)+CHR$(190)+CHR$(189);:PRINT@705,STRI
NG$(22,191)+" LANDING BAY "+STRING$(22,191)+CHR$(188)+CHR$(176);
:PRINT@641,STRING$(25,191)+CHR$(181)+STRING$(6,176)+STRING$(22,1
91)+CHR$(188)+CHR$(176);
47 PRINT@577,STRING$(25,191)+CHR$(149)+STRING$(6,32)+STRING$(20,
```

```
191)+CHR$(180);:PRINT@513,STRING$(25,191)+CHR$(149)+STRING$(6,32
)+CHR$(168)+STRING$(17,191)+CHR$(180);
48 PRINT@449,STRING$(25,191)+CHR$(144)+STRING$(7,32)+CHR$(184)+S
TRING$(14,191)+CHR$(189);:PRINT@385,STRING$(24,191)+CHR$(181)+ST
RING$(9,32)+CHR$(186)+STRING$(10,191)+CHR$(181)+CHR$(144)+CHR$(1
76);
49 PRINT@321,STRING$(24,191)+CHR$(149)+STRING$(10,32)+CHR$(176)+
CHR$(180)+CHR$(184)+STRING$(7,191)+CHR$(148);:PRINT@257,STRING$(
24,191)+CHR$(148)+STRING$(13,32)+CHR$(170)+STRING$(3,191)+CHR$(1
76)+CHR$(160)+CHR$(144);
50 PRINT@193,STRING$(22,191)+CHR$(190)+CHR$(189)+STRING$(15,32)+
STRING$(2,191)+CHR$(148);:PRINT@129,STRING$(19,191)+CHR$(189)+CH
R$(176)+STRING$(18,32)+CHR$(160)+CHR$(180);
51 PRINT@65,STRING$(19,191)+CHR$(149);:PRINT@1,STRING$(19,191)+C
HR$(147);
53 X=50:Y=4
```

Lines 55-100: Command routine; this routine calls all the other routines as needed. It also reduces and checks the amount of oxygen (variable O).

```
55 GOSUB1000:' GET REPORTS
60 GOSUB2000:'   INPUT VALUES
65 O=O-1
70 IFO<0GOTO200
75 GOSUB3000
78 GOSUB7000
80 GOSUB4000
100 GOTO55
```

Line 200: Out of oxygen routine.

```
200 PRINT@968,"YOU HAVE RUN OUT OF OXYGEN,";:PRINT@937,"YOU ARE
DEAD!!!";:FORA=1TO1900:NEXT:GOTO5
```

Lines 1000-1010: Displays speed, also shows oxygen low message if needed.

```
1000 PRINT@834,"V. SPEED =";INT(VS*100);" ";:PRINT@898,"H. SPEED
 =";INT(HS*100);" ";:PRINT@853,"OXYGEN =";O;:IFO<20PRINT@917,"OX
YGEN LOW!!!";
1010 RETURN
```

Lines 2000-2099: Get input routine. Peeks keyboard memory to see which combination of arrows are being pressed; then, depending upon the peeked value, another subroutine is called to adjust the appropriate variables.

```
2000 IFPEEK(14400)=8THENVS=VS+1ELSEIFPEEK(14400)=16THENVS=VS-1
2005 IFPEEK(14400)=32THENHS=HS-1ELSEIFPEEK(14400)=64THENHS=HS+1
2010 IFPEEK(14400)=40GOSUB2100
2015 IFPEEK(14400)=72GOSUB2105
2020 IFPEEK(14400)=48GOSUB2110
2025 IFPEEK(14400)=80GOSUB2115
2099 RETURN
```

Lines 2100-2115: Called by the above routine to adjust the ship's movement and speed.

```
2100 HS=HS-1:VS=VS+1:RETURN
2105 HS=HS+1:VS=VS+1:RETURN
2110 HS=HS-1:VS=VS-1:RETURN
2115 HS=HS+1:VS=VS-1:RETURN
```

Lines 3000-3020: RESETs ship's position, updates position, SETs new position, then checks for crash.

```
3000 RESET(X,Y):RESET(X+2,Y):RESET(X+1,Y-1):X=X+HS:Y=Y-VS:IFX>12
2THENX=122ELSEIFX<3THENX=3
3010 IFY<3THENY=3ELSEIFY>36THENY=36
3015 IFPOINT(X+1,Y-1)ORPOINT(X+1,Y)ORPOINT(X+2,Y)THEN6000
3020 SET(X,Y):SET(X+2,Y):SET(X+1,Y-1):RETURN
```

Lines 4000-4500: Checks ship's position and speed for successful landing.

```
4000 IFPOINT(X,Y+1)ANDPOINT(X+1,Y+1)ANDPOINT(X+2,Y+1)ANDHS<3ANDH
S>-3ANDVS>-5ANDVS<5THENGOSUB5000:'SUCCESSFUL LANDING
4500 RETURN
```

Lines 5000-5040: Successful landing; displays landing message, figures points awarded based upon remaining oxygen and difficulty level.

```
5000 PRINT@868,"SUCCESS!!! YOU'VE LANDED!!";:PRINT@932,STRING$(2
5,32);
5005 PRINT@834,"V. SPEED = 0  ";:PRINT@898,"H. SPEED = 0  ";
5010 FORA=1TO6:READP,Q,R,S:SET(X1+P,Y1-Q):SET(X1+R,Y1-S):FORB=1T
O50:NEXTB,A:RESTORE
5020 O=INT(((O*15)*SL/2)):R=O/100:FORA=1TO100:PRINT@932,"POINTS
="A*R;:NEXTA:PRINT@932,"POINTS ="O;".........";
5030 PRINT@867,"PRESS ENTER TO PLAY AGAIN";
5040 INPUTA:GOTO5
5500 GOTO5
```

Lines 6000-6010: Crash routine. Displays crash graphics and message, then returns to beginning of program.

```
6000 CLS:FORX=1TO4:FORY=1TO8:PRINTA$;:NEXT:PRINTCHR$(28);:FORY=1
TO8:PRINTB$;:NEXT:PRINTCHR$(28);:FORY=1TO8:PRINTC$;:NEXTY:PRINTC
HR$(28);:NEXTX
6010 PRINT@460,"YOU CRASHED!!!!     YOU ARE DEAD!!!!";:FORA=1TO1
900:NEXT:GOTO5
```

Line 7000: Checks (using POINT function) to determine if crash has taken place.

```
7000 IFPOINT(X,Y-1)ORPOINT(X+1,Y)ORPOINT(X+2,Y-1)ORPOINT(X-1,Y)O
RPOINT(X+3,Y)GOSUB6000ELSERETURN
```

Lines 8999-9000: Data for building the dome after successful landing.

```
8999 '   DOME DATA = 24 ELEMENTS
9000 DATA0,1,10,1,1,2,9,2,2,3,8,3,3,4,7,4,4,5,6,5,5,5,5,5
```

Lines 11000-11020: Builds wide angle graphic display.

```
11000 '         MAJOR APPROACH

11010 PRINT@641,STRING$(10,191)+CHR$(149);
11011 PRINT@705,STRING$(11,191)+CHR$(188)+STRING$(50,191);:PRINT
@769,STRING$(62,191);:PRINT@653,CHR$(190)+STRING$(29,191)+CHR$(1
89)+CHR$(180)+CHR$(184)+CHR$(188)+STRING$(16,191);
11012 PRINT@577,STRING$(9,191)+CHR$(188)+CHR$(148)+STRING$(2,32)
+CHR$(160)+CHR$(190)+STRING$(25,191)+CHR$(181)+CHR$(176)+CHR$(14
4)+STRING$(3,32)+CHR$(176)+CHR$(184)+STRING$(14,191);
11013 PRINT@513,STRING$(7,191)+CHR$(188)+CHR$(180)+STRING$(6,32)
+CHR$(176)+CHR$(190)+STRING$(17,191)+CHR$(181)+STRING$(2,176)+CH
R$(190)+CHR$(191)+CHR$(180)+STRING$(9,32)+CHR$(184)+STRING$(12,1
91);
11014 PRINT@449,STRING$(3,191)+CHR$(188)+CHR$(176)+CHR$(144)+STR
ING$(11,32)+CHR$(160)+CHR$(184)+STRING$(14,191)+CHR$(188)+STRING
$(3,32)+CHR$(160)+CHR$(180)+STRING$(12,32)+CHR$(168)+CHR$(190)+S
TRING$(9,191);
11015 PRINT@385,CHR$(188)+STRING$(19,32)+CHR$(176)+CHR$(190)+STR
```

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PREPACK

PREPACK is an S-80 article for disk users.

by John R. Olsen Jr.

There are currently several packing programs available from different sources. Basically, what each does is to shorten your program so that it will run faster and consume fewer bytes of memory. This is accomplished by removing unnecessary spaces, REM statements, and by combining your program lines into multiple line statements wherever the program logic permits.

There are two disadvantages in the packing programs that I have used. Before packing your program, you must be sure that each print statement ends in a quotation mark. Frequently the programmer leaves it off (example: PRINT "BYE) because it is unnecessary and saves a byte. However, when these lines are packed into multiple line statements, the end quote becomes mandatory. If it is missing, the program will crash.

Another disadvantage of the packing programs I have used is that they do not remove any unnecessary semicolons. In many places, the semicolon can be removed without harming the program, while in others, it's required (see figure 1). If the unneeded ones could be removed, it would result in additional memory savings.

I would hate to count the time spent editing lines and adding quotes to them before packing. And I gave up trying to edit out all the unnecessary semicolons. It just wasn't worth the time. But finally, my soul revolted! I wasn't going to put up with this! Let the computer do the work for me (after all, it is supposed to be my slave)! So I wrote a program which will take care of these tasks.

I call the utility program PREPACK because it is used before packing. It will remove all unnecessary semicolons, and add any required quotes to your program which can then be packed without worry. The result will be a completely packed program that is more efficient.

The PREPACK utility program uses ASCII disk files. The program to be PREPACKed must be saved on disk in ASCII format. In that way, the PREPACK utility can read one program line at a time (using the LINEINPUT No. statement), modify it, and write it back on disk.

The one BIG disadvantage of this program is that it is in BASIC and therefore is slow! It can take 10 minutes to PREPACK a fairly long program. And comparing this with less than two minutes to pack the program (using a machine language pack), it seems like a snail's pace. But it is certainly faster than I could do by hand - and without errors! So give it a try and make your programs pack properly the first time, with additional saving of memory!

```
10 CLEAR1000
20 CLS
30 A$=CHR$(34)
40 PRINT@24,"PREPACK"
50 PRINT
60 PRINT"USE THIS UTILITY BEFORE PACKING YOUR PROGRAM.  IT ADDS
MISSING"
70 PRINT"QUOTES (LEFT OFF AT THE END OF PRINT STATEMENTS).  IT A
LSO"
80 PRINT"ELIMINATES UNNECESSARY SEMICOLONS AND SPACES."
90 PRINT
100 PRINT"1.  LOAD YOUR PROGRAM."
110 PRINT"2.  SAVE YOUR PROGRAM BACK ON DISK IN ASCII ("A$"FILES
PEC"A$",A)."
120 PRINT"3.  THE DISK MUST HAVE ENOUGH SPACE FREE FOR A 2ND ASC
II COPY."
130 PRINT"4.  RUN THIS PROGRAM."
140 PRINT
150 PRINT"THIS PROGRAM CAN ALSO BE USED AFTER PACKING, AS LONG A
S THE"
160 PRINT"LENGTH OF EACH PROGRAM LINE DOESN'T EXCEED 240 BYTES."
170 INPUT"
ARE YOU READY FOR STEP 4";D$
180 IFLEFT$(D$,1)<>"Y"THENEND
190 CLS
200 INPUT"WHAT IS THE FILESPEC";B$
210 PRINT"
THE MODIFIED PROGRAM WILL BE SAVED BACK ON DISK IN ASCII.
"
220 INPUT"WHAT WILL BE THE NEW FILESPEC";C$
230 IFC$=B$PRINT"-> FILESPECS MUST BE DIFFERENT.":GOTO220
240 OPEN"I",1,B$
250 OPEN"O",2,C$
260 CLS
270 PRINT"MODIFYING"
280 IFEOF(1)THENCLOSE:PRINT:PRINT:PRINT"THE MODIFIED PROGRAM IS
NOW BEING LOADED.  YOU SHOULD THEN SAVE":PRINT"IT BACK ON DISK (
SO IT WILL LOAD FASTER THAN THE ASCII VERSION).":PRINT"THEN RUN
OR PACK THE PROGRAM.":PRINT:LOADC$
290 PRINT"* ";
300 LINEINPUT#1,D$
310 E=1
320 P=2
330 M$=MID$(D$,P,1)
340 IFM$=A$THENE=-E:GOTO360
350 IFE=1ANDM$=" "THEND$=LEFT$(D$,P-1)+RIGHT$(D$,LEN(D$)-P):P=P-
1
360 IFP<LEN(D$)THENP=P+1:GOTO330
370 IFE=1THEN400
380 IFRIGHT$(D$,1)=" "THEND$=LEFT$(D$,LEN(D$)-1):GOTO380
```

continued on page 87

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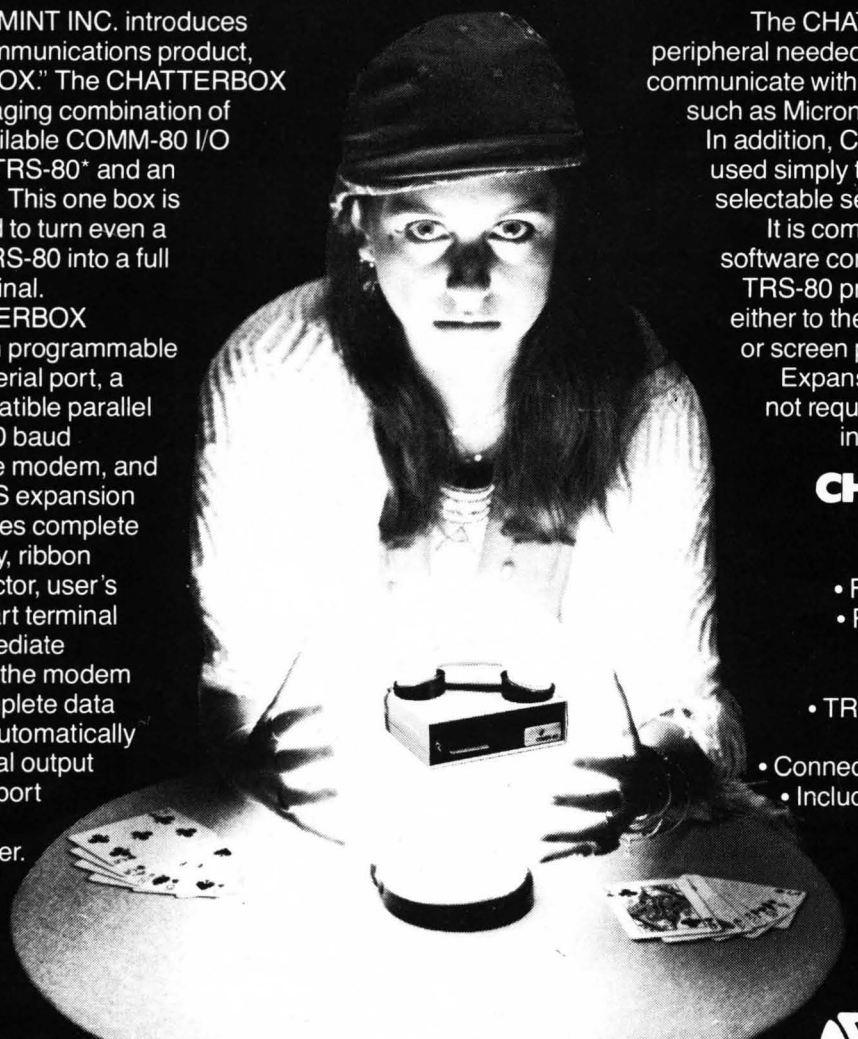

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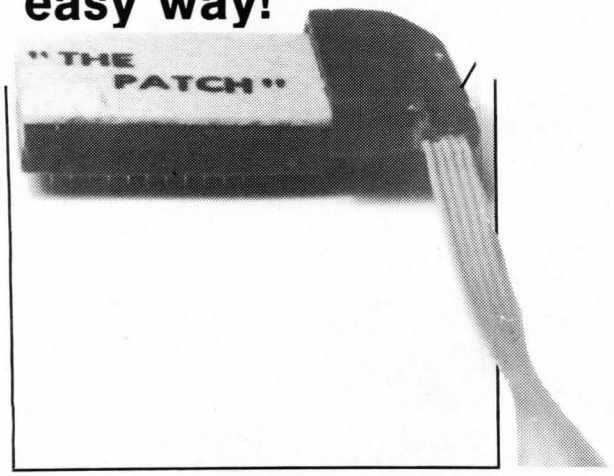

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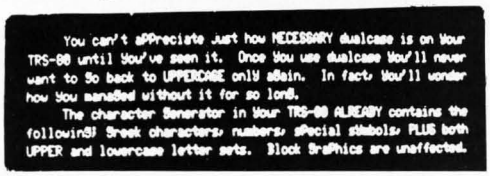

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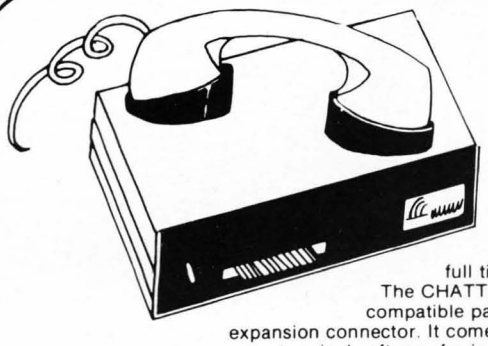

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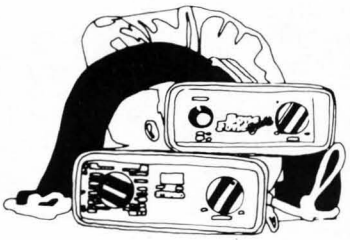

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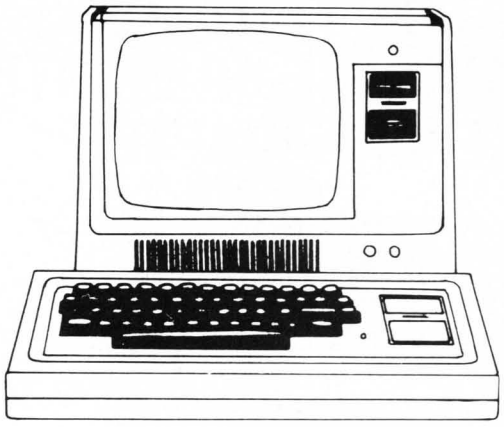

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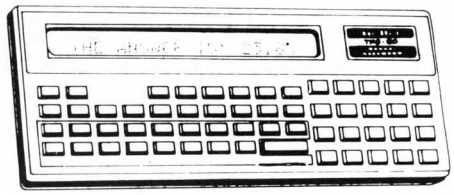

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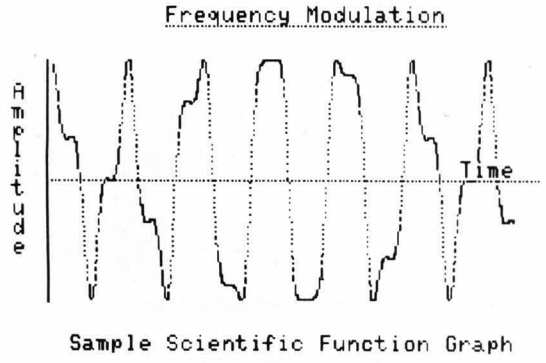

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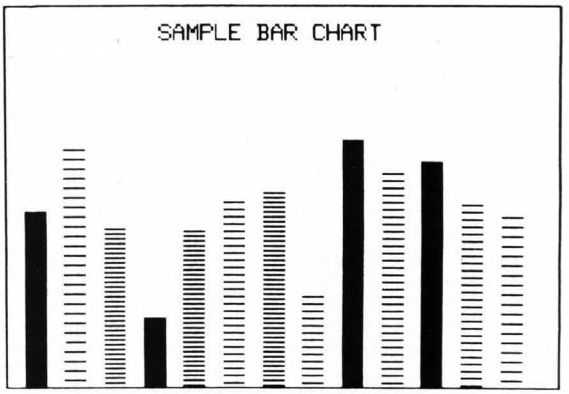

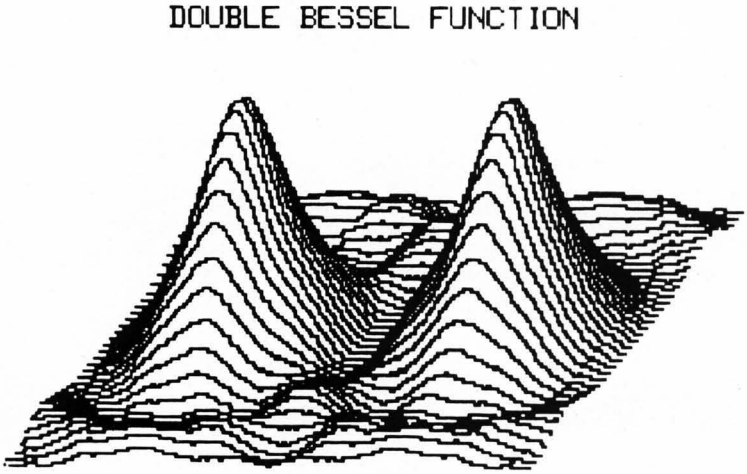

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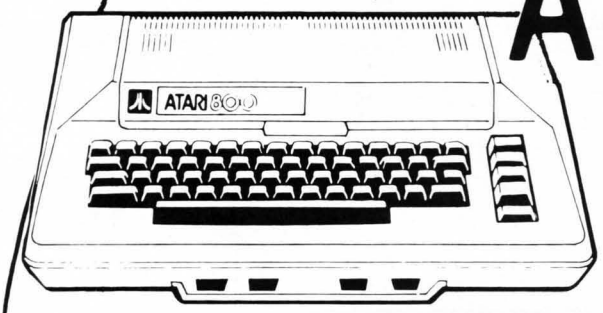

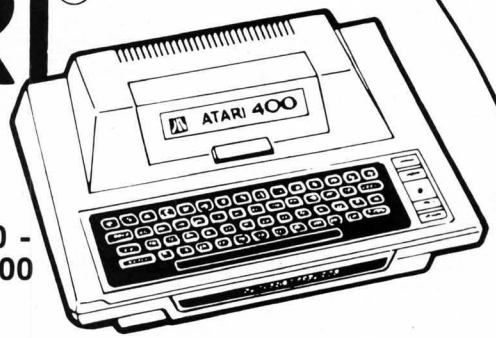

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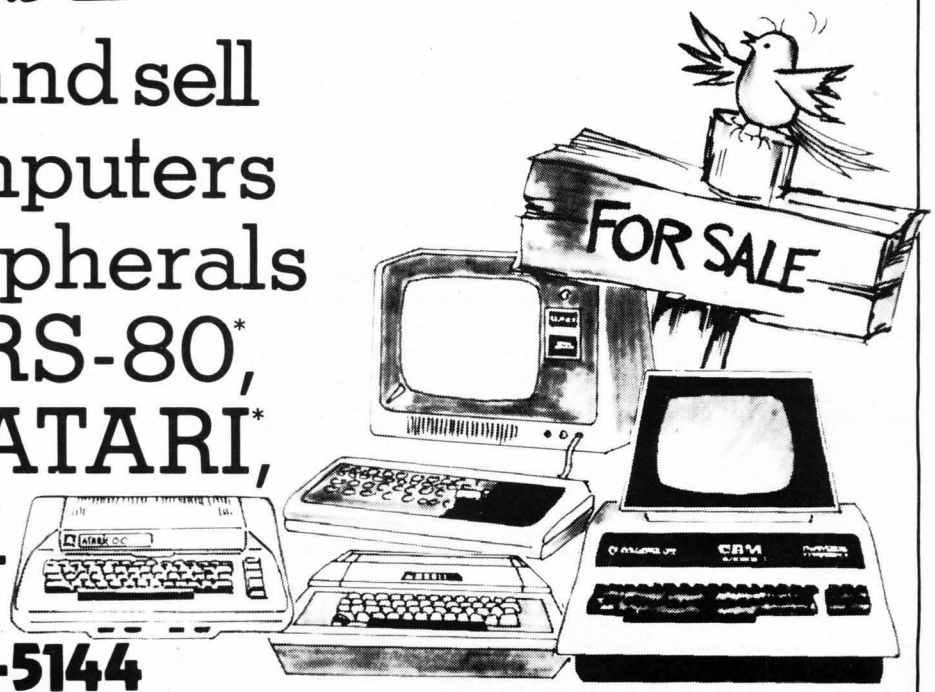

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DATAPOKE

The following article will be of interest to Level II users who do not have a disk.

by William K. Mason

Here is a program, written in BASIC, that converts SYSTEM tapes into BASIC tapes. It solves what I think is a common dilemma. Suppose you have a BASIC program that calls a machine language subroutine via the USR command. The subroutine is on a SYSTEM tape. Thus, to use the program, you must set memory size, load the SYSTEM tape, then load the BASIC tape. If your SYSTEM tapes are like mine, they don't always load the first time. This procedure is a nuisance and may lead to profanity, insanity, or divorce.

You would like to put the machine language subroutine in DATA statements as part of the main BASIC program. Then the BASIC program could POKE it into place. But putting the subroutine in DATA statements is not so easy, at least if it's a long one. (One of mine takes 1500 memory locations.) You must:

1. Get the machine language instructions in decimal form. I do this by loading the SYSTEM tape and then using the PEEK instruction. I don't have a printer so the decimals must be copied by hand.
2. Type the numbers from step 1 onto DATA statements. Even a printer won't do this for you.
3. Preface the DATA statements by BASIC commands, which set the proper memory size, and then POKE the data into protected memory.

Fortunately, this tedious procedure can be avoided. The DATAPOKE program listed in this article does steps 1-3 for you. You load your SYSTEM tape, and then CLOAD and RUN DATAPOKE. When the run is finished, the DATA statements, prefaced by the proper POKE instructions, are in memory. You can CSAVE them on tape or add more instructions.

If you use DATAPOKE on a program that must be linked into BASIC, for example, Radio Shack's KBFIX, you might add an instruction that prints, "To link into BASIC, enter SYSTEM, then /X", where X is the program's starting address. (This suggestion is printed on the screen by DATAPOKE.)

The DATAPOKE program itself contains no DATA statements; they are created by the subroutine in lines 440-460. Also, notice that line 10 looks rather strange. (Be sure you type it in exactly as shown, without extra blanks.) Line 10 is modified as DATAPOKE runs.

A simple illustration of a program that modifies one of its own lines is:

```
10 GOTO20:PRINT"HI MA"
20 PRINT"HI PA"
30 FOR K = 0 TO 3:POKE
17133 + K,32:NEXT
```

If you are careful to type in line 10 exactly as shown, then the first time you run it the program will print "HI PA." The second time you run it, it will print "HI MA HI PA." This happens because GOTO20: is stored in locations 17133-17136, and line 30 overwrites these locations with blanks (32 is ASCII code for blank). For a fuller exposition of how BASIC programs are stored in memory, see the fine article by Dick Straw in the **80-US Journal**, Sept.-Oct. 1979 issue.

DATAPOKE is written for 16K Level II. If you have more memory, you must make a few changes because POKE requires that locations higher than 32767 be represented as negative numbers. Delete DEFINTA-Z from lines 40 and 80. Change lines 130-145. Replace line 10 by:

```
10 GOTO20:*POKE16561,
*** :POKE16562,***:CLEAR50:
FORK = *****TO*****:
READN
12 IFK < = 32767THEN
POKEK,N ELSEPOKE32767-K,N
14 NEXT
```

I haven't tested these changes because I only have 16K.

Finally, I'll describe the procedure for using DATAPOKE in more detail.

1. Set memory size as required by the SYSTEM program.
2. Enter 'SYSTEM' and the filename in the usual way.
3. When the tape has finished loading and the second *? appears, enter /6681 (or, if you're like me and can't remember a number like 6681, enter /1 and set memory size again). Do NOT enter /(starting address) or / alone. You don't want the SYSTEM program to run because it might modify itself.
4. CLOAD and RUN DATAPOKE.
5. Answer the two questions about the memory locations you want saved.
6. When the run is finished, prepare cassette and CSAVE your converted SYSTEM program.

A$ Keyboard input. Appears in lines 130, 140.

C Count of DATA statements filled up plus one. Appears in lines 150, 400, 410.

DN Line number of DATA statement currently being filled. Appears in lines 150, 250, 290, 300, 400, 450.

EN Memory location for start of DATA statement currently being filled. Appears in lines 40, 50, 60, 80, 190, 210, 320, 330, 340, 350, 400, 440, 450, 460.

I General loop index. Appears in lines 180, 190, 200, 380, 520.

K Index number of memory location to be saved. Appears in lines 160, 170, 220, 400.

L Final memory location to be saved. Appears in lines 140, 145, 240, 500.

L! (single precision) used to test if final memory location too large. Appears in line 140.

LY Least significant byte of integer Y. Appears in lines 50, 60, 340, 360, 430, 440, 450, 470.

M Smallest memory location to be saved. Appears in lines 110, 120, 130, 145, 170, 240, 250, 470, 490.

MY Most significant byte of integer Y. Appears in lines 50, 60, 340, 360, 430, 440, 450, 480.

N Two uses: (1) The number of memory locations to be saved. Appears in lines 150, 160, 400. (2) Length of string to be Poked into

continued on page 88

DOUBLE CANNON

by David Bolkhe

DOUBLE CANNON is an Atari program requiring 8K.

DOUBLE CANNON is a shoot-em-up (or down) game for one or two players. A sharp eye is needed to judge when the randomly moving target crosses the path of your laser cannon. But you can't waste time waiting for the perfect shot, as the game is also timed. Yet, it is important that you not waste any shots, either, since your cannon has just enough energy for twenty shots.

To fire, the player on the left need only press the Z key, while the player on the right should press the M key. A green box will indicate the time remaining in the game and a blue box for each cannon will show the number of shots you have used. Hits are recorded by red blocks above each cannon's blue box. For two players, the winner is the shooter with the most hits. When there is just one player, the object is to get as many hits as possible using both cannons.

Included with the line listing are definitions of the major variables. Also, a line-by-line description of the main game loop is presented. Perhaps of interest to programmers is the movement of the target. The target location for the PLOT commands is X,Y. This is adjusted each move by the variable X1 and Y1 (line numbers 302, 307). For example; if X=30, Y=10, X1=1 and Y1=1, then after line number 307 has been executed, X=31 and Y=11 — so the target is moving down and to the right.

When the target reaches the right edge of the screen, X1 will be changed to -X1 (X1=-1), since in line 302 the test for X greater than 57 is true. Now the X value will decrease by one as Y increases — so the target will move down and to the left. A similar change in direction for the target occurs whenever X or Y reaches the edge of the target area, as defined in line numbers 302 and 305.

```
5 REM DAVE BOHLKE     COGGON, IA
6 REM  DOUBLE CANNONS
 Lines 10,20: Colors used (May need to
 be adjusted for your TV)
10 GRAPHICS 5:SETCOLOR 0,6,7
20 SETCOLOR 2,4,7:SETCOLOR 4,15,8

  Lines 100-106: Plots for the two
  cannons

100 COLOR 1:PLOT 8,31:DRAWTO 0,39
102 PLOT 9,32:DRAWTO 2,39
104 PLOT 71,31:DRAWTO 79,39
106 PLOT 70,32:DRAWTO 77,39

  Lines 110-114: X,Y is the location of
  the target

110 X1=1:Y1=1
112 X=INT(RND(1)*25)+25
114 Y=INT(RND(1)*15)+3

  Lines 119-126: Messages

119 PRINT
120 PRINT " LEFT  press  Z  , and  RIGHT
   M "
122 PRINT "Each side has 20 shots, shown
 in BLUE"
124 PRINT "HITS are displayed in RED.  "

126 PRINT "Time left is indicated in GRE
EN. ";

  Lines 150-164: Plots blue boxes

150 PLOT 9,39:DRAWTO 31,39
152 PLOT 9,37:DRAWTO 31,37
154 PLOT 9,38:PLOT 31,38
160 PLOT 69,39:DRAWTO 47,39
162 PLOT 69,37:DRAWTO 47,37
164 PLOT 69,38:PLOT 47,38

  Line 170: LH, RH are PLOT locations
  for left hits, right hits:  LS,RS
  indicate the number of shots taken by
  each side; T is the time remaining

170 LH=9:RH=69:LS=10:RS=68:T=32

  Lines 172-176: Plots green box

172 COLOR 2:PLOT 31,31:DRAWTO 47,31
174 PLOT 31,33:DRAWTO 47,33
176 PLOT 31,32:PLOT 47,32

  Lines 200-350: Main Game Loop

  Line 200: Plot target

200 COLOR 3:GOSUB 900

  Lines 202-245: Check for shot and hit
  with left cannon
  Line 202: If 'Z' is pressed, then
  PEEK(764) will equal 23

202 P=PEEK(764):POKE 764,0

  Line 220: If 'Z' is not pressed,
  branch to 250

220 IF P<>23 THEN 250

  Line 221: Set background color; check
  if left has any shots remaining

221 SETCOLOR 4,7,8:IF LS>30 THEN 290

  Line 222: Draw laser beam

222 COLOR 2:PLOT 1,39:DRAWTO 40,0

  Line 223: Make sound for laser
223 GOSUB 850

  Line 224: Plot shot used for left

224 PLOT LS,38:LS=LS+1

  Line 225: Check for hit: If hit then
  plot hit, increment count, GOSUB 860

225 H=40-X-Y:IF (H>0) AND (H<4) THEN COL
OR 3:PLOT LH,35:LH=LH+2:GOSUB 860

  Line 245: Blank laser beam

245 COLOR 4:PLOT 1,39:DRAWTO 40,0:GOTO 2
90
  Lines 250-288: Same as 202-245, except
  with respect to the cannon on the
  right

250 IF P<>37 THEN 290
251 SETCOLOR 4,7,8:IF RS<48 THEN 290
252 COLOR 2:PLOT 78,39:DRAWTO 39,0
253 GOSUB 850
254 PLOT RS,38:RS=RS-1
255 H=41-X+Y:IF (H>0) AND (H<4) THEN COL
OR 3:PLOT RH,35:RH=RH-2:GOSUB 860
288 COLOR 4:PLOT 78,39:DRAWTO 39,0
  Line 290: Check if either cannon has
  shots remaining

290 IF (LS>30) AND (RS<48) THEN 800

  Line 296: Check for end of time

296 IF T>45 THEN 800
  Lines 302,305: Check if target is
  boundary: adjust X1,Y1 if not: incre-
  ment time on Y1

300 COLOR 4:GOSUB 900
301 SETCOLOR 4,15,8
302 IF (X>57) OR (X<22) THEN X1=-X1:FOR
I=1 TO 15:SOUND 0,X+Y,10,7:NEXT I
305 IF (Y<1) OR (Y>20) THEN Y1=-Y1:T=T+0
.5:FOR I=1 TO 15:SOUND 0,X+Y,10,7:NEXT I
  Line 307: Adjust X,Y to new target lo-
  cation
307 X=X+X1:Y=Y+Y1

  Line 309: Plot time box

309 COLOR 3:PLOT T,32

  Line 320: Check for end of time
  (redundant as 296)

320 IF T>45 THEN 800

  Line 350: Continue main game loop

330 SOUND 0,0,0,0
350 GOTO 200

  Lines 800-820: End of game INPUT
  routine

599 GOTO 599
800 PRINT :PRINT "PRESS  RETURN  for nex
t game  ?  ";
810 P=PEEK(764):IF P=12 THEN RUN
815 SOUND 0,RND(1)*250,10,7
820 GOTO 810
  Lines 850-852: Laser sound
850 FOR I=X TO X+10:SOUND 0,I,10,11
852 NEXT I:SOUND 0,0,0,0:RETURN

  Lines 860-878: Sound for hit; blank
  target; set new target

860 SETCOLOR 4,3,9:FOR J=10 TO 190
864 SOUND 0,J,12,9:NEXT J
868 COLOR 4:GOSUB 900
870 X=INT(RND(1)*25)+25
872 Y=INT(RND(1)*15)+5
878 RETURN
  Lines 900,904: Plots target
900 PLOT X+1,Y:PLOT X+2,Y+1:PLOT X,Y+1
904 PLOT X+1,Y+2:PLOT X+1,Y+1:RETURN
```

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THE HARDER SIDE OF LIFE

by Bob Kinerk, interview with Joe Breton

Bob Kinerk is a professional writer with no computer experience. By means of extensive interviews with employees, he is writing a series of articles presenting the human side of SoftSide *and Robitaille & Sons.*

The merchants of Milford, two or three Saturdays back, hauled great quantities of their wares out of doors and carefully arranged them for display on rickety-looking card tables and on the dusty, grey sidewalk itself. A trend toward bazaar economics, I wondered. Some new fad sweeping in from the Middle East? Were my Yankee neighbors even now donning their burnooses and reading up on how to haggle?

I stood by the store window listening for the tintinnabulations of what I assumed would be the inevitable camel bells until a visitor disabused me of my mistaken notion. It was Milford's Sidewalk Sale Day, an annual merchandising extravaganza celebrated beneath the powerful midsummer sun.

Out came the cup and saucer sets, the racks of marked-down jerseys, the displays of silver jewelry and the unopened cartons of sweatshirts. Socks were going at three pairs for a buck, and you could buy attractive sandals fresh from the hands of a Korean cobbler for as little as a dollar ninety-nine.

Were I as quick-witted as some of my friends, I might have hustled a TRS-80 or two out of doors, a bit of peripheral paraphernalia, an Atari 800, perhaps, with its vivid color display, and waited for the tides of humanity Sidewalk Sale Day brings to flow in my direction, jingling and jangling their pocketfuls of change.

Ahhhhh, merchandising.

My immediate problem, however, was finding the Hardside cashbox. Any more elaborate pitch had to wait on that fundamental discovery. And I had in mind a letter that needed answering. A customer from Rhode Island had written to ask if Hardside was for real.

His letter, of course, was more complex than that. He had started with questions of a less penetrating nature: "Are you affiliated with Radio Shack? What guarantees do you offer? What local services are available?" Three easy pitches and then the curve ball. "In view of your prices, are you guys for real?" The Doubting Thomas question. The confirmed skeptic's question. "Is there a Santa Claus? Are you for real?"

He had seen our ad in **Popular Electronics**, the ad in which we offered the TRS-80 sold by Radio Shack for $889 at a price (modesty compels me to blush) of only $669.

It's not the exact TRS-80, needless to say. The numeric key pad won't be found on ours. Most people don't use it because the math operands are not there. If it's game playing or use as a calculator or checkbook balancing, the numeric key pad needn't come into play.

I took a seat on the maple stool behind the glass-topped counter and began more or less composing these thoughts into an answer (I had given up, temporarily, my search for the elusive cash box), when a man with "BIKE" written on his T-shirt stepped through the store's front door. "Health Yourself" the rest of his chest's message said. He was in the market for a computer, he told me, that would interface with his amateur radio station for antenna directions.

Would the TRS-80 do it?

He didn't want something from the (expletive deleted) Shack, he said, so we talked about three levels of Microtechtronics and the one level PET offers. I suspected we were getting either over his head or over mine. I'm not a ham operator myself. Two hams work in the other building, but I hardly ever see them at the store.

"Of course, you could go Apple so you don't have to do so much home brew," I suggested. He perked up appreciably at that, and it broke my heart to have to tell him we are primarily a mail order house and that, if mail order people try selling Apple products, the Apple brass threatens to step down on them. Next, of course, it does step down on them, and if that doesn't work they stir up the Chiricahua Apaches to ride out from their wattle hogans and burn the offender's trading post down.

The ham operator throught that over for a while, pulling out his wallet in the meantime and purchasing a copy of the latest **BYTE**. The shy and retiring cash box gave me a moment's concern, but I found it at last underneath a calculator on the shelf where it was supposed to be. While he thumbed through **BYTE**, I stepped to the front window again to see how my neighbor merchants were doing at their sidewalk sale. The ones with foresight had dragged lawn chairs out of their backyards and set them up behind their heaps of watchbands and plumbing supplies and neck scarves and so forth. They sat there, some of them with visors on, their feet up on cartons pulled conveniently close, keenly eyeing passers-by, ready to leap into action at the first sign of a possible sale.

Perhaps, I thought, it is not too late to hustle an Atari outside. Had I sounded, I wondered, apologetic when I said we were mostly a mail order house? Had I said 'mostly' or had I said 'merely?' Had I created an impression of second-class citizenship?

No need to apologize for that. It is the mail order concept with its low overhead and high volume that permits us to offer the kind of benefits we do.

"We're basically like a warehouse operation," I said. "We know how much we have to make on top of pricing and we don't really have to make more than that." My thoughts had returned with a triumphant yelp to the impertinent question posed by the Rhode Island letter writer. "Are you for real?"

The "Health Yourself" man, his nose buried in **BYTE**, was understandably alarmed — or possibly would have been if the store had not been filling up and my comments hadn't been drowned out. Someone wanted an

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Adventureland tape for an eagerly waiting, curly-haired boy. Someone came in for a chatterbox he had ordered. A man looking intently at the software display declined my offer of assistance. Less than half my attention had gone to him anyway. Several appropriate remarks to make to the man who wondered if we were for real were popping off like fireworks inside my head, and what you might call a splendid defense of doing business the way Hardside does business was in the process of being born.

We want to give a good price and we don't want to leave our customers out in the cold. We make a reasonable effort to help. We've got our own service unit here. There are some people out there with lower prices than Hardside. We don't claim to have the lowest price everywhere. Our intention is to offer the best possible price and still give good service. We give a 180-day warranty on the TRS-80. That's twice what Radio Shack offers, and when you bring a unit in for repair our expressions don't instantaneously freeze into masks of grief and pain the way expressions at Radio Shack do. (Repairs done under warranty at Radio Shack outlets are debits against the account of the dealer — hence the look of pain.) Radio Shack items we can't fix ourselves we ship to Radio Shack. If it's under warranty, then we pay the bill out of our own pockets. If it's something like a ROM problem (proprietary to Radio Shack), we are obliged to send it to Radio Shack to be repaired.

Now there are other companies out there offering basic units and various peripherals at prices comparable to Hardside — let us call them Pooped Out Peripherals or POPs for short — who will tell you the instant something goes wrong, "Well, that's too bad, but you have no recourse except to send it to the manufacturer." Our own service unit can fix almost any basic computer problem (85 to 90% of the TRS-80 problems), any basic printer problem, etc. We don't go beyond that, and there are some things (like disk drives, by nature very technical) we prefer not to touch.

Our biggest expense is advertising. A lot of times we'll introduce a product (the Atari line is a good example). When we took on the Atari 800, we had to say we liked the computer and we knew what its capabilities were. The question was would Atari advertise to let people know about those capabilities. It took three months from the time we advertised before we made a sale. A full page ad in a magazine like **BYTE** costs $3,000. We took that risk. Now we are selling Ataris at the rate of three to five units a week. So we can go back to the manufacturer and negotiate to get a better price. When we first introduced the Atari 800 we advertised a price of $875. Now we can sell it at $819 because of larger volume.

Are we for real?

Pah!

Take that, Rhode Island.

The man who wanted the chatterbox was helping set up Adventureland for the kid. The man who'd been looking at software selected a cassette. I don't recall what had become of the ham who wanted to interface. Bea Kimball came in with a fresh stack of **Pathways**, and when we tried to fit them in the display rack, the stack went sploosh (those slick stock covers), and copies of **Pathways** slithered hither and yon. Perhaps the man whose shirt said "BIKE" seized that moment to escape. The street, of course, continued to be enticing. Merchandising in its most rudimentary form was taking place out there. Heaps of bargains and hordes of bargain hunters. The tintinnabulations of the camel train's sweet bells. Ah, Free Enterprise, I thought as I glanced out the window, how varied are your forms. A philosophical notion, that, which deserved more attention, but I hadn't the time to pursue it. I climbed on my maple stool again and began mentally composing a brilliant answer to the skeptic from the Ocean State.

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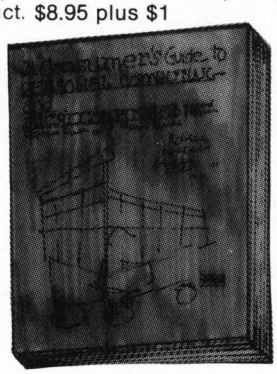

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Additional functions and features now available in both the IBM and Scientific Time Sharing implementations have been included in this edition, and the chapters on workspace management and function definition have been substantially rewritten providing additional graphic aids to the student. Where appropriate, sections have been included on distinctive features of the IBM 5100 Computer.

For this edition, nearly all the example functions in the text have been placed in a workspace named 1 CLASS. If your APL system lacks this workspace, it may be obtained from Scientific Time Sharing Corporation. $16.95 plus $3.

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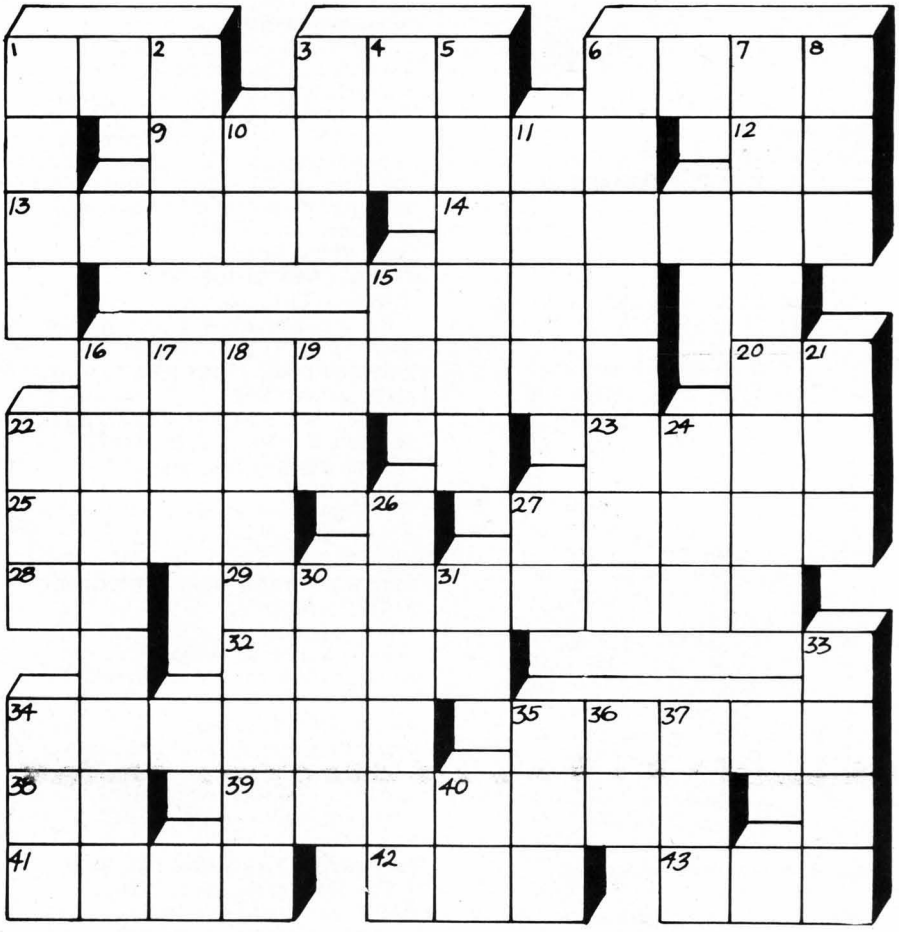
CROSSWORD PUZZLE



ACROSS

1. African antelope which erases programs

3. DATA is to READ as NEXT is to ---

6. Building this is just part of what you must do to solve the PIRATE'S COVE adventure

9. Sugar tablet which is good for whatever ails you

12. One of ten possible directions to travel in the Colossal Cave

13. Like GOTO, only more like a boomerang

14. Where we find the good Count Christo in VOODOO CASTLE

15. One of several things encountered in the chimney of VOODOO CASTLE

16. Wholesale counterpart of The Software Exchange

20. stnemurtsnI saxeT (abbr.)

22. Make fast while mountain climbing

23. ---- it. What I did to my program (2 words)

25. " . . .yneew yneet ystib ----"; type of bikini worn by the girl in the mirror

27. INTERLUDE is this kind of program

28. Julius Caesar's third to last word

29. You might be more than merely mildly suspicious of a poker-playing buddy who claimed to have this hand (2 words)

32. For best results, do not type with these when entering programs from SoftSide

34. Parts of the body

35. Type of energy

38. Chemical symbol for the 75th element

39. "-------body happy?"; famous Durante line (1 1/2 words)

41. Garden where programs run correctly the first time

42. Tree-like creature from Tolkien's trilogy

43. What the parrot likes to do to your crackers in the adventure mentioned in 6-across

DOWN:

1. Programmer's motto: "Garbage In, Garbage Out" (abbr.)

2. Method used by The Software Exchange to send your order (abbr.)

3. Contains lemon-freshened borax

4. ynapmoC (abbr.)

5. Piece of information stored on a tape or disk file

6. Your favorite software magazine

7. Use these when you are too tired to sign your name

8. We hope you are not using this to solve the puzzle!

10. The middle of clue

11. In PIRATE'S COVE, you may find a clue in one

15. Two thirds of a distress call

16. After executing the RESTORE command, your DATA list is -------- to the first item of DATA in your program

17. Key found on some older teletype machines, but not on the Apple, S-80, or Atari

18. Keep in good repair

19. The ends of way

21. Explosive

22. Word used to sign off the Atari and some time-sharing systems

24. Type this to see what a program does

26. One wears glasses to help ---- -- (2 words)

27. Anti abbreviation for "@"

30. Electrically charged atoms

31. Chemical symbol for the 99th element

33. Fraternity (slang)

34. Mineral deposit

35. Command used to light a graphics point on the S-80

36. Boolean operator
37. Not the best thing with which to clean your keyboard
40. yvne fo elddim ehT

	C	H	I	P		B	A	S	I	C	
	P	A	R	I	T	Y		A	C	H	E
C	U	R	E		A	T		F	E	E	L
O		D		A	B	E		E		S	F
L	O	W			L		P		O	S	
O	R	A	N	G	E		I	R	V		A
N		R	O	O		E	N	T	E	R	S
	A	E		D		A			R	O	C
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	I	M	P	U	T		N	E	W	S	

Solution to last month's puzzle

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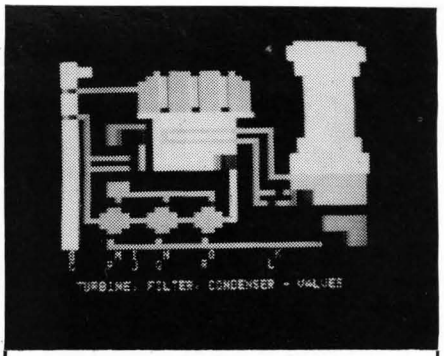

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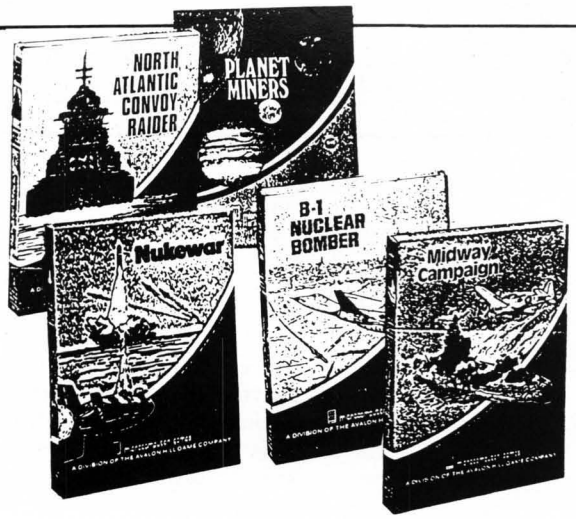

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From Avalon Hill

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This game is a computer simulation of the Bismarck convoy raid of 1941. The computer controls the British convoys and British battleships. Will the Bismarck sink the Hood, only to be sunk in turn by the Rodney and King George V, as in history? Or, will the Bismarck cripple or sink the British Home Fleet and go rampaging through the convoy lanes? Your decisions will determine the fate of the Bismarck.

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This SOLITAIRE game includes software and instructions for the following computers: TRS-80* Level II, 16K Memory. Apple II*, Applesoft* BASIC, 16K Memory beyond BASIC Pet*, 16K Memory.

PLANET MINERS ($15)

PLANET MINERS gives one to four players the chance to compete with each other and the computer to stake valuable mining claims throughout the solar system in the year 2050. Each player must decide which ships to send to which planets and when to try "dirty tricks" like sabotage and claim-jumping. If there are less than four players, the computer takes the other parts. (It can even play all by itself!) Thus, PLANET MINERS can either be played solitaire or with friends.

This 1-4 player game includes software and instructions for the following computers: TRS-80* Level II, 16K Memory Apple II*, Applesoft* BASIC, 16K Memory beyond BASIC Pet 2001*, 16K Memory.

B-1 NUCLEAR BOMBER ($15)

This game gives you an opportunity to be the pilot of a B-1 bomber on a mission over the Soviet Union. You must fly the plane through the stiff Russian defenses to the target city, bomb it, and return home. Your computer controls the Soviet air defense bases with their almost unlimited numbers of MiG's (fighters) and SAM's (surface-to-air missiles). Your only chance to get through is to rely on the superior technology of your sophisticated ECM (electronic counter measures) and self-defense missiles. When all else fails, you can try violent evasive maneuvers.

This SOLITAIRE game includes software and instructions for the following computers: TRS-80* Level II, 16K Memory Apple II*, Applesoft* BASIC, 16K Memory beyond BASIC Pet*, 16K Memory.

MIDWAY CAMPAIGN ($15)

MIDWAY CAMPAIGN is a computer simulation of the battle for Midway Island. Your microcomputer controls a huge force of Japanese ships whose objective is to invade and capture Midway Island. If the Japanese can win air superiority over Midway, the success of the invasion is virtually guaranteed. If not, they will be forced to turn back to prevent the loss of irreplaceable troops who would be totally vulnerable in their invasion craft. In the actual engagement, the Japanese made several tactical errors which cost them the battle. Your computer probably won't make the same mistakes! You command the badly outnumbered and outranged U.S. Navy forces. Your only advantage is surprise.

This SOLITAIRE game includes software and instructions for the following computers: TRS-80* Level II, 16K Memory Apple II*, Applesoft* BASIC, 16K Memory beyond BASIC Pet*, 16K Memory

STRINGS and THINGS

STRINGS AND THINGS is an article dealing with both S-80 and Atari graphics.

by Mark A. Ohlund

Many of us who own or have access to a personal computer are familiar with the term "super graphics." Various authors, especially Leo Christopherson, have mastered the technique and consequently add a new dimension to their programs and programming ability. In this article I will compare the technique between the TRS-80 and the Atari computers, and, in the process, discuss the means by which these two computers store strings in memory. Those of you who already know about "super graphics" on one of the computers might stick around to find how the other half of the world stores its strings.

The term "super graphics" refers to the use of a character string to print out some sort of specialized graphics display. This display is accomplished by determining the location of the string in memory and then POKEing the ASCII values of the graphics characters (including line feeds and backspaces) into those memory locations occupied by the string.

In the TRS-80, determining the place in memory at which a string is located is accomplished through the use of the function VARPTR(A$), in which "A$" is the string with the memory location we wish to find. VARPTR does not return the actual memory location of the string; rather, it returns a memory address which stores the location of the string in RAM. This system of storing one memory address within another is called a POINTER, hence the name VARPTR or variable pointer. The value stored in the location returned by VARPTR(A$) will tell us the length of A$. The next two locations store the place in memory where we can find A$, with the Least Significant Byte (LSB) in location VARPTR(A$)+1 and the Most Significant Byte (MSB) stored in location VARPTR(A$)+2. In order for us to obtain the actual memory location of A$ in memory, we must PEEK at these two locations, and through the proper arithmetic manipulations we can obtain A$'s location. The manipulations are as follows:

```
10 I=VARPTR(A$)
20 X=PEEK(I+1)+256*PEEK(I+2)
```

In this example, X will return the location of A$ in memory. This confusing sequence of operations is necessary because the TRS-80 allocates its string space dynamically. That is, the space in memory for a string is only allocated when the string is introduced in some expression in the program. Since at the beginning of a program the computer does not know just how much memory will be devoted to storing strings, it must use a POINTER system in order to keep track of where in memory the various strings are located. If the user tries to reference a numeric variable such as X, the function VARPTR(X) will NOT return a pointer to another address, but rather the actual address where the variable is stored. This is because numeric constants have a predefined range and occupy a specific number of bytes in memory. Whether two, four, or eight bytes are used is dependent on whether the constant is an integer, single precision or double precision number, respectively. One might wonder, "Why not just use direct addressing to store the string location — surely strings don't move around in memory?" This, however, is not the case. Those of us who have worked with a large data base program which manipulates hundreds or thousands of strings on our TRS-80 have experienced the phenomenon known as "string gathering." This is a term used to describe the re-allocation of memory when the computer has run out of the space in memory it originally allocated for strings. This is evidenced by an apparent "hanging up" of the TRS-80, in which the system appears to have crashed, and even the BREAK key produces no results. Fear not! The system has not crashed; it is merely re-allocating space for its strings, and is, in fact, moving the strings currently stored in memory to regions unknown. This is the primary reason for a pointer system, which is constantly updated, even when the strings are moved around in memory. When string space is filled in the TRS-80, the "string gathering" cleans up those strings no longer in use in the program. In this manner, as much memory as possible is freed for future string use. A direct addressing system would never function in a system like this.

In contrast to the TRS-80's pointer system, the Atari takes a very different approach. String space is reserved at the beginning of program execution through the use of the DIM function. In this manner, string length is limited only by the amount of available memory and not to the arbitrary 255 characters in a string that one finds with the TRS-80. Since string space is reserved in memory at the beginning of program execution, there is no need for a pointer system which will keep track of the string in memory. In this case, a direct addressing system will work because the string will remain in the same place in memory throughout program execution. Since strings always have enough space because space is reserved ahead of time, the user never experiences any "string gathering" with the Atari.

The memory location of a string constant can be determined directly through the use of the function ADR(A$) where A$ is the string whose location we wish to find. Just as with the TRS-80, once the memory address of the string in memory is found, the ASCII values of various graphics characters may be POKEd into those locations previously occupied by the string. Once this is done, a complex (or simple) graphics design may be displayed simply by PRINTing the string whose locations were POKEd with the graphics — in this case, A$.

The best way to demonstrate the

procedure of "super graphics" is through a program example. The following two short programs, one for the TRS-80 and the other for the Atari, will each produce a display of an open square with a dot in the middle. The actual POKEing routine is very similar in both segments; however, the method by which the string (A$) is set up in both of the programs does differ.

The numbers in the DATA statements are the ASCII values of the graphic characters which are being POKEd into the string's memory space. In the TRS-80 example, shown in figure 1, the values 176 and 191 are the actual graphics blocks. ASCII values of 26 and 24 are line feeds and backspaces respectively, and the ASCII 32 is a space. With the Atari, the ASCII character set is shifted to provide for other graphics characters. Thus different ASCII values must be used to produce the same results. The Atari listing is shown in figure 2.

In both these listings, the assignment of the slashes ("/") to A$ is completely arbitrary. You could use spaces or any alphanumeric characters; the choice is yours. With each computer, it is important to assign a string with a length equal to the number of characters that will be POKEd into it, including backspaces and line feeds (which is what the ASCII 30 and 29 are on the Atari). If too few characters are in the string, the graphic design will not be complete. If too many characters are set in the initial string, then some of the assigned characters will appear in the final design. What the user should remember is that by POKEing data into string space the user can only modify existing strings and not create new strings or extend previous strings.

You may have noticed that line 20 in the Atari listing is much shorter than the corresponding line 10 in the TRS-80 listing. Atari's line 20 does not really fill A$ with slashes; rather, it places a slash in the last byte of A$. There will be nothing particularly meaningful in the first 48 characters of A$ (usually hearts), but we have succeeded in convincing the computer that the string is really 49 characters long.

In this article I have tried to give a short tutorial and comparison of string handling between two of the more popular personal computers on the market. Each machine handles string organization within memory by a quite different method, and as a result, each encounters advantages and disadvantages not found in the other computer. The TRS-80 must allocate string space as strings are introduced and, consequently, has the problem of "string gathering" while the Atari does not have this problem since memory is reserved ahead of time. On the other hand, the Atari will not permit the DIMensioning of an array of strings such as A$(10,10) since this notation does not refer to ten strings of length ten; rather it is used within the program to specify a substring which begins at the 10th character and continues all the way to the 10th character (a complicated way of accessing just the 10th character of A$). Thus, to gain an array of strings with the Atari, the user must DIMension a large string and then assign various parts of it to smaller strings. The TRS-80 allows direct accessing of string arrays. Which system is better? I'll let you decide that question for yourself.

FIGURE ONE

```
10 A$="////////////////////////////////////"
20 CLS:I=VARPTR(A$)
30 J=PEEK(I+1)+256*PEEK(I+2)
40 FOR K=J TO J+36
50 READ X:POKE K,X
60 NEXT K
70 PRINT A$
80 GOTO 80
90 DATA 176,176,176,176,176,176,176,26,24,24,24,24,24
100 DATA 24,24,191,32,32,176,32,32,191,26,24,24,24,24
110 DATA 24,24,24,191,176,176,176,176,176,191
```

FIGURE TWO

```
10 GRAPHICS 0:DIM A$(49)
20 A$(49)="/"
30 I=ADR(A$)
40 FOR K=I TO I+48
50 READ X:POKE K,X
60 NEXT K
70 ? A$:?
80 END
90 DATA 160,160,160,160,160,29,30,30,30,
30,30,160,32
100 DATA 32,32,160,29,30,30,30,30,30,160
,32,160,32,160
110 DATA 29,30,30,30,30,30,160,32,32,32,
160,29,30,30
120 DATA 30,30,30,160,160,160,160,160
```

An Atari One Liner

Here is an Atari One Liner which requires a set of 2 paddles (to be plugged into slot #1). With a little practice, you can use the programs as a fancy 3-color "Etch-a-Sketch". One paddle controls horizontal movement; the other controls vertical movement. The two paddle buttons change the color of the line drawn. Unless your dexterity quotient is quite high, you may find it helpful to invite a friend to control one paddle.

```
10 GRAPHICS 23:PLOT 0,0:FOR T=1 TO 1E+12
:COLOR 2*PTRIG(0)+PTRIG(1):DRAWTO 159-PA
DDLE(0)/1.46,95-PADDLE(1)/2.43:NEXT T
```

Rich Bouchard
James Garon

An Atari One Liner

(Type the "4" and the word "flashes" in inverse mode.)

```
1 GRAPHICS 18:? #6;"4 FAST";" flickering
 flashes":FOR J=0 TO 1E+12:FOR I=706 TO
712:POKE I,RND(0)*255:NEXT I:NEXT J
```

by James "you-can-do-it-better" Garon

CHAINER

CHAINER is an article and program for S-80 disk users who have or are interested in NEWDOS 80.

by Frank R. Neal

Upon receiving my NEWDOS-80, after a delay of about a month, I could hardly wait to dig into those "new" commands. NEWDOS-80 is just about everything that I expected, but there are some problem areas.

The format command was a little disappointing because you have to use SUPERZAP to lock out any bad tracks. The FORMAT command will not do it for you! Another area that lacks documentation is the new file handling routines. If you are an expert at computer programming, you will have no problems, although, if you are like me, hmmmm. The sample programs that are included are not much help either.

One of the new features of NEWDOS-80 is the chaining command. The documentation that is included (about 3/4 of a page in the manual and a badly written instructional program) will hardly fill the bill for a new owner of NEWDOS-80.

If you examine the program "CHAINTST/BAS" on your NEWDOS-80 disk, you will note that there are no remark statements included. Also left out are definitions of several important program lines. No hint is given to what lines 400, 500 or 900 do in the program and I found nothing in the manual either.

Here are some important facts that for the most part are left out:

1. A "/JCL" extension is required on all chaining files. If this is left out, you will get a "PROGRAM NOT FOUND" error. For the chaining program to find your chaining file, this must be added.

2. Line 400 of the "CHAINTST/BAS" program refers to a "CHR$(130)." No real use for this command has been found other than for a sort of "REM" statement. When the chaining command finds this in the file, it simply passes over it, as far as I know. Any ideas? The statement that follows it is simply stored. Are these easy REM statements for SUPERZAP? The syntax is just as shown in line 400.

3. Line 500 contains a "CHR$(131)." This is just like a PRINT statement in BASIC but instead you follow the syntax of line 500 and when the CHAIN command encounters it, it will print it on the screen. This will keep the user updated during chaining.

4. Line 900 contains the "CHR$(129)" command. This command makes the chaining stop and wait for you to press ENTER. It will also print a message just like CHR$(131) along with a "CHAINING PAUSED" message.

The program that is included with NEWDOS-80 (CHAINTST/BAS) is of no real use unless it can be used in some way to help discern how the CHAIN command is being used. It will not actually build a chaining file for you. This is why I have written the "CHAINER." You can use it to build your own chaining files or modify it for your specific needs. The chaining done in NEWDOS-80 is referenced to the DOS operating system. In other words, if you want to CHAIN a BASIC program, the first thing you must do is enter BASIC. For example the first command might be: BASIC RUN "PROGRAM." Then after you are in BASIC and your program is running, you can continue with other chaining commands. Of course, the chainer will work equally well in DOS.

Referring to the chainer program listing in figure 1, lines 90-130 set up the file name and drive with the "/JCL EXTENDER." Lines 160-230 receive and print to disk your chaining commands. Lines 200-310 will add strings together where you might need several statements in one command. Lines 330 460 will add on the "CHR$(XXX)" statement to the command, if you wish.

Upon running the program, the first thing you will be asked for is the file name for the chaining file. Simply enter the BASIC filename. The program will add on the "/JCL" and the drive number you choose later. The second question you will be asked is what drive number you want to place the file on. The program will then ask for the number of commands that you will need to enter. Next, the "COMMAND FILE ADDITION?" question will appear. Simply answer yes or no. This will add multiple commands together if needed, but don't try to use it like BASIC. Only use this to keep the syntax correct. A little experimenting here will help. If you use the "COMMAND FILE ADDITION" when you are finished with that command, you will be asked if you want to include a "CHR$(XXX)" at the beginning of your statement. For example, if you want the CHAINER to print - PRESS ENTER TO CONTINUE -, you would first say yes to the "COMMAND FILE ADDITION" question. Then answer -PRESS ENTER TO CONTINUE- for the string question. You will then be asked "DO YOU WANT A CHR$(XXX) ADDED?" Reply "YES" You will receive a menu of the three possible CHR$$(XX) functions. Since we want CHAINER to pause, we use "CHR$(129)." When the program stores this, it will look like this in the program:

A$(X)+CHR$(129)+ "PRESS ENTER TO CONTINUE"

When the chaining reaches this point, it will pause and print "PRESS ENTER TO CONTINUE" along with a "CHAINING PAUSED" message. The chaining will then wait until you press ENTER and then continue on with the next CHAIN command.

You can run the "CHAINTST/BAS" program to get an idea of just what chaining can do. When you are ready to check your CHAIN file, use:

CMD"S+CHAIN, CHAINFILE"

for BASIC, or use:

CHAIN,CHAINFILE- for DOS.

Don't be afraid to experiment with this program, although I

suggest that you use a disk that contains no valuable data. CHAIN is a powerful command at your disposal and learning to use it can be of great value to any programmer.

```
10 REM   xx CHAINER xx
20 REM xx FOR NEWDOS-80 CHAINING COMMAND xx
30 REM       BY FRANK R. NEAL
40 REM          1358 BYRON AVE.
50 REM          COLUMBUS, OH    43227
60 REM          COPYRIGHT 1980 BY FRANK R. NEAL
70 REM          ALL RIGHTS RESERVED
80 CLS:CLEAR 1000
90 LINEINPUT"CHAIN FILENAME   ";FL$
100 INPUT"ENTER DRIVE TO STORE FILE";DN$
110 INPUT"ENTER NUMBER OF CHAIN COMMANDS TO BE ENTERED";CM
120 REM  ADD '/JCL' TO FILENAME
130 FL$=FL$+"/JCL:"+DN$
140 OPEN "O",1,FL$
150 REM START INPUTTING CHAINING COMMANDS
160 FOR X=1 TO CM
170 PRINT"COMMAND STRING ADDITION ?":GOSUB 250
180 IF IN$="Y" THEN 280
190 PRINT"ENTER COMAND #";X;"  ";:LINEINPUT A$(X)
200 REM SEND CHAINING COMMAND TO FILE
210 PRINT#1,A$(X)
220 NEXT X
230 CLOSE:END
240 REM INKEY ROUTINE
250 IN$=INKEY$:IF IN$="" THEN 250
260 IF IN$="Y" OR IN$="N" RETURN ELSE 250
270 REM STRING ADDITION
280 PRINT"ENTER A 'Z' TO TERMINATE ADDITION OF STRING.":A$(X)=""
290 LINEINPUT"STRING ? ";ST$
300 IF ST$="Z" THEN 330
310 A$(X)=A$(X)+ST$:GOTO 290
320 REM ADD CHAINING COMMAND ?
330 PRINT"DO YOU WANT A 'CHR$(X)' ADDED ?":GOSUB 250
340 IF IN$="N" THEN 210
350 PRINT"          MENU":PRINT
360 PRINT" 1.  CHR$(129)  'CHAINING PAUSE WITH MESSAGE'"
370 PRINT" 2.  CHR$(130)  'CHAINING REMARK STATEMENT'"
380 PRINT" 3.  CHR$(131)  'CHAINING PRINT STATEMENT'"
390 PRINT" 4.  RETURN TO NEXT COMMAND"
400 PRINT:INPUT"CHOICE  ";CO
410 REM ADDITION OF CHR$(XXX)
420 IF CO=1 THEN A$(X)=CHR$(129)+A$(X):GOTO 210
430 IF CO=2 THEN A$(X)=CHR$(130)+A$(X):GOTO 210
440 IF CO=3 THEN A$(X)=CHR$(131)+A$(X):GOTO 210
450 IF CO=4 THEN 210
460 PRINT"INVALID ENTRY":GOTO 400
```


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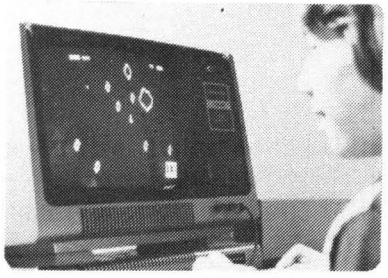

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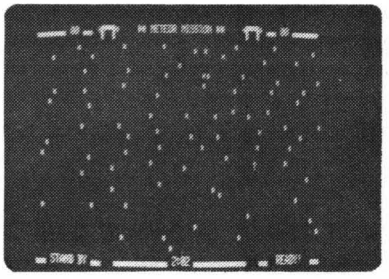

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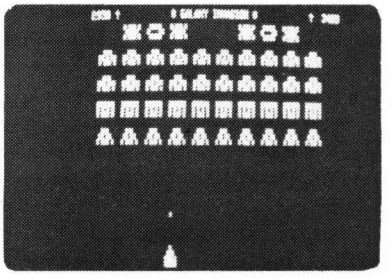

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INTERNA-MAZE
continued from page 43

```
   28,32 AT Q: COLOR=6: HLIN 28
   ,32 AT 38-Q: NEXT Q: RETURN
520 FOR Q=11 TO 14: COLOR=4: VLIN
   Q,38-Q AT 38-Q: COLOR=7: HLIN
   24,27 AT Q: COLOR=6: HLIN 24
   ,27 AT 38-Q: NEXT Q: RETURN
530 FOR IN=21 TO 22: COLOR=4: VLIN
   17,20 AT IN: NEXT IN: COLOR=
   7: PLOT 22,16: COLOR=6: PLOT
   22,21: RETURN
540 COLOR=4: PLOT 20,19: COLOR=
   7: PLOT 20,18: COLOR=6: PLOT
   20,20: RETURN
550 COLOR=4: PLOT 19,19: RETURN
560 REM
      MAKE LEFT TURN
570 GOTO 580+I*10
580 FOR Q=1 TO 5: COLOR=4: VLIN
   Q,38-Q AT Q: COLOR=7: HLIN
   1,Q AT Q: COLOR=6: HLIN 1,Q AT
   38-Q: NEXT Q: RETURN
590 FOR Q=6 TO 10: COLOR=4: VLIN
   Q,38-Q AT Q: COLOR=7: HLIN
   6,Q AT Q: COLOR=6: HLIN 6,Q AT
   38-Q: NEXT Q: RETURN
600 FOR Q=11 TO 14: COLOR=4: VLIN
   Q,38-Q AT Q: COLOR=7: HLIN
   11,Q AT Q: COLOR=6: HLIN 11
   ,Q AT 38-Q: NEXT Q: RETURN
610 FOR IN=16 TO 17: COLOR=4: VLIN
   17,20 AT IN: NEXT IN: COLOR=
   7: PLOT 16,16: COLOR=6: PLOT
   16,21: RETURN
620 COLOR=4: PLOT 18,19: COLOR=
   7: PLOT 18,18: COLOR=6: PLOT
   18,20: RETURN
630 COLOR=4: PLOT 19,19: RETURN
640 REM
      TURNING
650 COLOR=4: IF Z# ASC("B") THEN
   660: FOR Q=1 TO 37: HLIN 1,
   37 AT Q: NEXT Q: RETURN
660 IF Z# ASC("L") THEN 670: FOR
   Q=1 TO 37: VLIN 1,37 AT Q: NEXT
   Q: RETURN
670 IF Z# ASC("R") THEN RETURN
   : FOR Q=1 TO 37: VLIN 1,37 AT
   38-Q: NEXT Q: RETURN
680 REM
      DRAW DEAD-END
690 COLOR=4: IF C(K)=15 THEN COLOR=
   15: GOTO 700+I*10
700 FOR IN=2 TO 35: VLIN 2,35 AT
   IN: NEXT IN:I=6: RETURN
710 FOR IN=6 TO 32: VLIN 6,32 AT
   IN: NEXT IN:I=6: RETURN
720 FOR IN=11 TO 27: VLIN 11,27
    AT IN: NEXT IN:I=6: RETURN
730 FOR IN=15 TO 23: VLIN 15,23
    AT IN: NEXT IN:I=6: RETURN
740 FOR IN=18 TO 20: VLIN 17,20
    AT IN: NEXT IN:I=6: RETURN
750 PLOT 19,19:I=6: RETURN
760 REM
      HEADED SOUTH
770 FOR I=0 TO 5
780 TX=X-1:TY=Y+I: IF TX<1 OR TY>
   37 THEN 800:K=39*TX+41*TY
790 IF C(K)=MC OR C(K)=TC THEN
   GOSUB 490
800 TX=X+1: IF TX<1 THEN 820:K=
   39*TX+41*TY
810 IF C(K)=MC OR C(K)=TC THEN
   GOSUB 570
820 TX=X:TY=Y+I: IF TY>38 THEN
   850:K=39*TX+41*TY
830 IF C(K)#MC AND C(K)#TC THEN
   GOSUB 690
840 IF C(K)=TC AND FTS=1 THEN GOSUB
   1270
850 NEXT I: RETURN
860 REM
      HEADED WEST
870 FOR I=0 TO 5
880 TY=Y-1:TX=X-I: IF TX<1 OR TY<
   1 THEN 900:K=39*TX+41*TY
890 IF C(K)=MC OR C(K)=TC THEN
   GOSUB 490
900 TY=Y+1: IF TY>37 THEN 920:K=
   39*TX+41*TY
910 IF C(K)=MC OR C(K)=TC THEN
   GOSUB 570
920 TY=Y:TX=X-I: IF TX<0 THEN 950
   :K=39*TX+41*TY
930 IF C(K)#MC AND C(K)#TC THEN
   GOSUB 690
940 IF C(K)=TC AND FTS=1 THEN GOSUB
   1270
950 NEXT I: RETURN
960 REM
      HEADED EAST
970 FOR I=0 TO 5
980 TY=Y+1:TX=X+I: IF TX>37 OR
   TY>37 THEN 1000:K=39*TX+41*
   TY
990 IF C(K)=MC OR C(K)=TC THEN
   GOSUB 490
1000 TY=Y-1: IF TY<1 THEN 1020:K=
   39*TX+41*TY
1010 IF C(K)=MC OR C(K)=TC THEN
   GOSUB 570
1020 TY=Y:TX=X+I: IF TX>38 THEN
   1050:K=39*TX+41*TY
1030 IF C(K)#MC AND C(K)#TC THEN
   GOSUB 690
1040 IF C(K)=TC AND FTS=1 THEN GOSUB
   1270
1050 NEXT I: RETURN
1060 REM
      HEADED NORTH
1070 FOR I=0 TO 5
1080 TX=X+1:TY=Y-I: IF TX>37 OR
   TY<1 THEN 1100:K=39*TX+41*TY
1090 IF C(K)=MC OR C(K)=TC THEN
   GOSUB 490
1100 TX=X-1: IF TX<1 THEN 1120:K=
   39*TX+41*TY
1110 IF C(K)=MC OR C(K)=TC THEN
   GOSUB 570
1120 TX=X:TY=Y-I: IF TY<0 THEN 1150
   :K=39*TX+41*TY
1130 IF C(K)#MC AND C(K)#TC THEN
   GOSUB 690
1140 IF C(K)=TC AND FTS=1 THEN GOSUB
   1270
1150 NEXT I: RETURN
1160 REM
      DRAW MAP
1170 GR
1180 XX=X:YY=Y:SC=SC+5
1190 FOR X=0 TO 38: FOR Y=0 TO 38
1200 K=39*X+41*Y: COLOR=C(K): PLOT
   X,Y
1210 NEXT Y,X:X=XX:Y=YY: FOR I=1
    TO 1000: NEXT I: GOSUB 290
   : GOTO 1810
1220 REM
      COMPASS
1230 IF COMP#1 THEN RETURN
1240 H$="NORTH EASTSOUTH WEST": CALL
   -936: VTAB 24
1250 TAB 17: PRINT H$((DIR+1)*5-
   4,(DIR+1)*5): RETURN
1260 REM
      DRAW FOOTPRINTS
1270 IF FTS#1 THEN RETURN
1280 IF C(K)#TC THEN RETURN :F=-
   F
1290 COLOR=0: PLOT 19+F,37-I*3
1300 RETURN
1310 REM
      REMEMBER MAP
1320 FOR A=0 TO 38
1330 FOR B=0 TO 38
1340 K=39*A+41*B: IF A=19 AND B=
   19 THEN GOSUB 1410
1350 C(K)= SCRN(A,B): NEXT B,A: RETURN
1360 REM
      MACHINE LANGUAGE ROUTINE
          FOR NOISE BASE
1370 POKE 2,173: POKE 3,48: POKE
   4,192: POKE 5,136: POKE 6,208
   : POKE 7,4: POKE 8,198: POKE
   9,1: POKE 10,240
1380 POKE 11,8: POKE 12,202: POKE
   13,208: POKE 14,246: POKE 15
   ,166: POKE 16,0: POKE 17,76
   : POKE 18,2: POKE 19,0: POKE
   20,96
1390 RETURN
1400 REM
```

```
        INSTRUCTIONS
1410 PRINT "PUSH 'F' TO GO FORWARD, '
     L' TO TURN ": PRINT "LEFT, 'R' T
     O TURN RIGHT, AND 'B' TO ":
      PRINT "TURN BACK."
1420 FOR I=1 TO 2000: NEXT I: RETURN
1430 REM
              START
1440 TEXT : CALL -936: VTAB 9
1450 TAB 13: POKE 50,63: PRINT " INTE
     RNA-MAZE ": POKE 50,255: PRINT
     : TAB 19: PRINT "BY": TAB 13
     : PRINT "DENNIS G. WARD"
1460 FOR D=1 TO 1000: NEXT D: POKE
     -16298,0
1470 PRINT : TAB 5: PRINT "THE COMPUT
     ER WILL DRAW A MAZE AT": PRINT
     "RANDOM, AND PUT YOU INSIDE, AND
      YOU"
1480 PRINT "HAVE TO FIND THE WAY OUT.
     ": TAB 5: PRINT "IF YOU FEEL INS
     ECURE, YOU CAN"
1490 PRINT "CHOOSE SOME AIDS - COMPAS
     S, MAP,": PRINT "OR LEAVE FOOTPR
     INTS.": PRINT : TAB 5: PRINT
     "WOULD YOU LIKE TO LEAVE FOOTPRI
     NTS"
1500 INPUT "BEHIND (Y/N)?",G$:FTS=
     0: IF G$(1,1)="Y" THEN FTS=
     1
1510 INPUT "WOULD YOU LIKE A COMPASS(
     Y/N)?",G$:COMP=0: IF G$(1,1
     )="Y" THEN COMP=1
1520 INPUT "WOULD YOU LIKE A MAP (LOS
     E 5 POINTS EACH TIME YOU USE IT)
      (Y/N)?",G$:MAP=0: IF G$(1,
     1)="Y" THEN MAP=1
1530 PRINT "*** NOTE - YOU LOSE ONE P
     OINT EACH": PRINT "TIME YOU GO F
     ORWARD IF YOU'VE ALREADY": PRINT
     "BEEN THERE!"
1540 PRINT : TAB 9: INPUT "DIFFICULTY
     ? (1 TO 10)",S: CALL -936: VTAB
     24: TAB 5: PRINT "I AM CREATING
     YOUR MAZE NOW.": GOSUB 130
1550 CALL -936
1560 REM
        FIND START & END POINTS
1570 PRINT "YOU ARE RED, THE END IS W
     HITE.":TC=1:L= RND (4): IF
     L#0 THEN 1580: COLOR=15: PLOT
     1,37: COLOR=TC:X=37:Y=1: PLOT
     X,Y:E=1:G=37: GOTO 1610
1580 IF L#1 THEN 1590: COLOR=15:
      PLOT 1,1:X=37:Y=37: COLOR=
     TC: PLOT X,Y:E=1:G=1: GOTO
     1610
1590 IF L#2 THEN 1600: COLOR=15:
      PLOT 37,1:X=1:Y=37: COLOR=
     TC: PLOT X,Y:E=37:G=1: GOTO
     1610
1600 COLOR=15: PLOT 37,37:X=1:Y=
     1: COLOR=TC: PLOT X,Y:E=37:
     G=37: GOTO 1610
1610 GOSUB 1320: GOSUB 1370
1620 POKE -16368,0
1630 DIR= RND (4): GOSUB 290: GOTO
     1810
1640 REM
        READ KEYBOARD
1650 Z= PEEK (-16384): IF Z<127 THEN
     1650:XX=3*( ABS (X-E)+ ABS
     (Y-G)): POKE 0,XX: POKE 1,25
     : CALL 2
1660 REM
        COMPUTE NEW DIRECTION
1670 IF Z= ASC("F") THEN DIR=DIR MOD
     4: IF Z= ASC("R") THEN DIR=
     (DIR+1) MOD 4: IF Z= ASC("B"
     ) THEN DIR=(DIR+2) MOD 4: IF
     Z= ASC("L") THEN DIR=(DIR+3
     ) MOD 4
1680 IF MAP#1 THEN 1690: IF Z= ASC(
     "M") THEN GOTO 1170
1690 IF Z= ASC("F") THEN 1700: GOSUB
     640: GOSUB 290: GOTO 1810
1700 GOSUB 290: GOSUB 1360
1710 REM
        FIGURE OUT MOVE AND
        CODE IT ON MAP (K)
      DEDUCT POINT (SC) IF BOO-BOO
1720 IF DIR#0 THEN 1740
1730 Y=Y-1:K=39*X+41*Y: IF C(K)=
     0 OR C(K)=1 THEN SC=SC+1: IF
     C(K)=0 THEN Y=Y+1
1740 IF DIR#2 THEN 1760
1750 Y=Y+1:K=39*X+41*Y: IF C(K)=
     0 OR C(K)=1 THEN SC=SC+1: IF
     C(K)=0 THEN Y=Y-1
1760 IF DIR#3 THEN 1780
1770 X=X-1:K=39*X+41*Y: IF C(K)=
     0 OR C(K)=1 THEN SC=SC+1: IF
     C(K)=0 THEN X=X+1
1780 IF DIR#1 THEN 1800
1790 X=X+1:K=39*X+41*Y: IF C(K)=
     0 OR C(K)=1 THEN SC=SC+1: IF
     C(K)=0 THEN X=X-1
1800 K=39*X+41*Y: IF C(K)=15 THEN
     1850
1810 IF DIR=0 THEN QWQ=1070: IF
     DIR=1 THEN QWQ=970: IF DIR=
     2 THEN QWQ=770: IF DIR=3 THEN
     QWQ=870
1820 IF Z= ASC("F") THEN GOTO 1830
     : POKE -16368,0: GOSUB QWQ:
      GOTO 1650
1830 C(K)=TC: GOSUB QWQ: POKE -16368
     ,0: GOTO 1650
1840 REM
        YOU MADE IT!
1850 COLOR=15: FOR Q=0 TO 17: HLIN
     2,36 AT 19+Q: HLIN 2,36 AT
     19-Q: NEXT Q: POKE -16368,0
     : CALL -936
1860 COLOR=9: HLIN 16,19 AT 18: HLIN
     16,18 AT 20: HLIN 16,19 AT
     22: HLIN 22,23 AT 18: HLIN
     21,24 AT 20: VLIN 20,22 AT
     12: VLIN 18,22 AT 16: VLIN
     19,22 AT 21
1870 VLIN 19,22 AT 24: VLIN 17,20
      AT 27: PLOT 10,18: PLOT 11
     ,19: PLOT 14,18: PLOT 13,19
     : PLOT 27,22: GOSUB 1360: GOSUB
     1910
1880 FOR D=1 TO 4000: NEXT D
1890 GOTO 1440
1900 REM
        SOUND "CHARGE"
1910 POKE 0,250: POKE 1,50: CALL
     2
1920 POKE 0,200: POKE 1,50: CALL
     2
1930 POKE 0,160: POKE 1,50: CALL
     2
1940 POKE 0,130: POKE 1,120: CALL
     2
1950 POKE 0,160: POKE 1,50: CALL
     2
1960 POKE 0,130: POKE 1,255: CALL
     2
1970 REM
        PRINT FINAL SCORE
1980 TAB 10: PRINT "YOUR SCORE = "
     ;(100-SC)
1990 RETURN
2000 REM
2010 REM
        HAVE FUN!
2020 REM DENNIS WARD/13520 #7 SW ELEC
     TRIC/BEAVERTON,OR/97005/(503)641
     -8538
```

"Our next speaker's topic is 'seven ways not to use your company's computer?!"

COMPUTER GRAPHICS

by Joan Truckenbrod

The programs written here are in Applesoft, but can be translated easily to the Atari, and also to the S-80 with some help. For some hints, see the September issue of SoftSide.

Contemporary television graphics and film animation frequently use computer-aided color graphic systems to produce both still and changing images. These color graphic systems have the potential for creating exciting visual effects. Animated sequences can be created by continually implementing slight changes in the size, position, and/or orientation of a figure and by drawing the new figures in rapid succession. During this process figures can be moved around the screen and can be increased or decreased in size. Scaling operations provide a valuable, easy-to-use technique for creating sophisticated effects for video, film, television applications, and computer programs.

You can simulate animation of objects in three-dimensional space on low cost computer graphic systems through scaling. Movement of an object toward or away from the viewer can be simulated by gradually changing the size of the object. As figures increase in size they appear to move closer to the viewer. Figures appear to recede in space as they are reduced in size.

The use of scaling eliminates the need for constructing three-dimensional perspective spaces. Examples of this technique are found in popular animated films such as the **Star Wars** series. Stars and spaceships appear to move out of deep space towards the viewer as they gradually increase in size. In television, animated sequences are now being used for station identification shorts in which the station name appears to move out from the background towards the viewer. A close analysis of these sequences reveals that the words or letters are merely changing size and possibly position on the screen. The sense of depth on the screen is an illusion created by employing scaling techniques.

The following programs illustrate the use of a scaling formula (see **SoftSide**, September, 1980) in creating the illusion of motion in a three-dimensional space. In the first example a rectangle appears to move back into space. This is accomplished by reducing the size of the rectangle and redrawing it on the same center point. This program will draw a series of progressively smaller rectangles and then erase them, beginning with the largest, to create the sense that they are disappearing into space. Each rectangle can be erased prior to drawing the next one by changing the location of the "S" FOR-NEXT loop. In order to do this the S loop must be put inside the R loop by exchanging lines 1000 and 1025, and lines 1110 and 1115. In this example, the size of the rectangle is changed according to a regular increment giving an even flow in the animated sequence. The increment of change can be varied by using different step values in the R loop in line 1025.

The next example illustrates the use of progressive increments for determining the size changes. Any figure that is defined in X and Y coordinates can be substituted for the rectangle. The number of points in the figure must be specified in line 30. The X and Y coordinates defining the figure are listed sequentially in the DATA statement in line 60. Whenever scaling programs are used, the animated sequence must be planned within the resolution limits of the computer graphics system. Check statements can be inserted into the program to continually evaluate the X and Y values to keep them within the range of the system. This example introduces the combination of scaling and translation (see **SoftSide, Apple**, July, 1980) techniques to enhance the illusion of a figure in three-dimensional space. This program moves a figure from the background in the lower left hand corner, to a central foreground position, and then to the background at the lower right hand corner of the screen. The scaling factor in this example is not a regular interval as in the first example. The scaling is calculated according to a series of progressive increments found in the DATA statement in line 220. These values were derived from the Fibonacci Series, a proportional set of values. (The third number is the sum of the first and second, the fourth is the sum of the second and third, etc.) Using this series of numbers produces an apparent acceleration of the figure. The same series of numbers are also used for determining the translation factors listed in the DATA statement in line 230. Both the changes in size and the changes in the location of the figure are determined by progressively increasing or decreasing intervals rather than regular intervals. As is evident from these two examples, there is significant potential for experimentation in creating seemingly three-dimensional, animated sequences with scaling techniques.

Listing #1

```
10  HCOLOR= 7
20  REM  VARIABLES :
21  REM  XC IS THE X COORDINATEOF
      THE CENTER POINT OF THE FIG
      URE
22  REM  YC IS THE Y COORDINATEOF
      THE CENTER POINT OF THE FIG
      URE
23  REM  NPTS IS THE NUMBER OF PO
      INTS USED TO DEFINE THE FIGU
      RE
24  REM  SF( )IS AN ARRAY THAT CO
      NTAINS A SERIES OF NUMBERS U
      SED SEQUENTIALLY AS SCALING
      FACTORS TO PRODUCE PROGRESSI
      VE SIZE CHANGES IN THE FIGUR
      E
25  REM  TF( )IS AN ARRAY THAT CO
      NTAINS A PROGRESSIVE SERIES
      OF NUMBERSUSED AS TRANSLATIO
      N FACTORS TO MOVE THE FIGURE
```

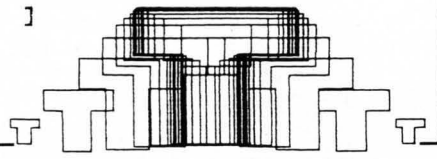
```
     TO DIFFERENT POSITIONS ON T
    HE SCREEN . A REGULAR SERIES
     OF NUMBERS CAN ALSO BE USED
     AS IN EX.1
30  DIM SF(11),TF(11)
40 NPTS = 9
55  HGR2
60  HCOLOR= 7
80  FOR I = 1 TO NPTS: READ X(I),
    Y(I): NEXT I
90  GOSUB 6000
100  FOR I = 1 TO 11: READ SF(I):
     NEXT I
110  FOR I = 1 TO 11: READ TF(I):
     NEXT I
209  REM  THE FOLLOWING DATA STAT
     EMENT CONTAINS THE X AND Y C
     OORDINATES THAT DESCRIBE THE
      FIGURE.
210  DATA  129,0,141,0,141,4,137,
     4,137,12,132,12,132,4,129,4,
     129,0
219  REM  THE FOLLOWING DATA STAT
     EMENT CONTAINS THE SCALING F
     ACTORS USED TO DEVELOP A SER
     IES OF DIFFERENT SIZE FIGURE
     S.
220  DATA   1.5,3.831,5.58,6.66,7
     .33,7.75,8,8.16,8.25,8.33,8.
     4
229  REM  THE FOLLOWING DATA STAT
     EMENT CONTAINS THE TRANSLATI
     ON FACTORS USED TO DETERMINE
      THE DISTANCE THAT EACH FIGU
     RE IS MOVED ON THE SCREEN.
230  DATA  124,89,55,34,21,13,8,5
     ,3,2,1
420  REM  SUBROUTINE 3000 MOVES T
     HE FIGURE FROM THE LEFT HAND
      CORNER OF THE SCREEN TO A C
     ENTRAL LOCATION WHILE PROGRE
     SSIVELY INCREASING THE SIZE
     OF THE FIGURE.
425  GOSUB 3000
440  REM  SUBROUTINE 2000 MOVES T
     HE FIGURE FROM A CENTRAL POS
     ITION TO THE LOWER RIGHT HAN
     D CORNER OF THE SCREEN WHILE
      PROGRESSIVELY DECREASING TH
     E SIZE OF THE FIGURE.
450  GOSUB 2000
500  END
2000  FOR R = 11 TO 1 STEP  - 1
2010  HCOLOR= 7
2020  REM  SUBROUTINE 4500 GENERA
     TES A NEW X COORDINATE THAT
     HAS BEEN MOVED TO THE RIGHT
     AS WELL AS ENLARGED.
2030 I = 1: GOSUB 4500
2035  REM  SUBROUTINE 4000 GENERA
     TES A NEW Y COORDINATE REFLE
     CTING CHANGES IN SIZE AND LO
     CATION.
2040  GOSUB 4000
2050  HPLOT NX,NY
2060  FOR I = 2 TO 9
2070  GOSUB 4500
2080  GOSUB 4000
2090  HPLOT  TO NX,NY
2095  NEXT I
2100  NEXT R
2200  RETURN
3000  HCOLOR= 7
3010  FOR R = 1 TO 11
3020  REM  SUBROUTINE 5000 GENERA
     TES A NEW X COORDINATE THAT
     HAS BEEN MOVED AND REDUCED I
     N SIZE.
3030 I = 1: GOSUB 5000
3040  GOSUB 4000
3050  HPLOT NX,NY
3060  FOR I = 2 TO 9
3070  GOSUB 5000
3080  GOSUB 4000
3090  HPLOT  TO NX,NY
3095  NEXT I
3100  NEXT R
3200  RETURN
4000 NY = (Y(I) + YC) * SF(R) - Y
     C + TF(R)
4010  RETURN
4500 NX = (X(I) - XC) * SF(R) + X
     C + TF(R)
4510  RETURN
5000 NX = (X(I) - XC) * SF(R) + X
     C - TF(R)
5010  RETURN
6000  REM  COMPUTE THE CENTER POI
     NT
6010 XS = 280:YS = 192:XL = 0:YL =
     0
6020  FOR J = 1 TO NP
6030  IF X(J) < XS THEN XS = X(J)

6040  IF X(J) > XL THEN XL = X(J)

6050  IF Y(J) < YS THEN YS = Y(J)

6060  IF Y(J) > YL THEN YL = Y(J)

6070  NEXT J
6080 XC = (XS + XL) / 2:YC = (YS +
     YL) / 2
6090  RETURN
]
```



Listing #2

```
10  REM  THIS PROGRAM DRAWS A SET
      OF SEQUENTIALLY SCALED RECT
     ANGLES TO CREATE A SENSE OF
     DEPTH IN SPACE
20  REM  VARIABLES:
21  REM  XC IS THE X COORDINATE O
     F THE CENTER POINT OF THE FI
     GURE
22  REM  YC IS THE Y COORDINATE O
     F THE CENTER POINT OF THE FI
     GURE
23  REM  NPTS IS THE NUMBER OF PO
     INTS USED TO DESCRIBE THE FI
     GURE
24  REM  R REPRESENTS THE SCALING
      FACTOR
30 NPTS = 5
40  DIM X(25),Y(25)
50  FOR I = 1 TO NPTS: READ X(I),
     Y(I): NEXT I
55  REM  THIS DATA STATEMENT CONT
     AINS THEX AND Y COORDINATES
     THAT DEFINE THE FIGURE TO BE
      SCALED
60  DATA  137,90,148,90,148,95,13
     7,95,137,90
65  GOSUB 3000
70  HGR2
1000  FOR S = 7 TO 0 STEP  - 7
1010  REM  THE VALUE OF S IS USED
      TO CONTROL THE COLOR OF THE
      FIGURE
1020  REM  THE FIRST TIME THE REC
     TANGLES ARE DRAWN S=7 AND TH
     EY ARE DRAWN IN WHITE.THE SE
     COND TIME S=0 AND THE RECTAN
     GLESARE DRAWN IN BLACK MAKIN
     G THEM APPEAR TO DISAPPEAR I
     N SPACE
1025  FOR R = 23 TO 1 STEP  - .3
1027  HCOLOR= S
1028  REM  SUBROUTINE 2000 CONTAI
     NS THE X AND Y SCALING FORMU
     LAS
1030 I = 1: GOSUB 2000
1050  HPLOT NX,NY
1060  FOR I = 2 TO NPTS
1070  GOSUB 2000
1090  HPLOT  TO NX,NY
1100  NEXT I
1102  FOR L = 1 TO 100: NEXT L
1110  NEXT R
1115  NEXT S
1200  END
2000 NX = (X(I) - XC) * R + XC
2010 NY = (Y(I) - YC) * R + YC
```

continued on page 80

OCTADRAW

continued from page 41

towards the top of the screen unless it is already there, in which case it is sent to the bottom (recall that P=95). The expression (Y=0) equals 0 if false and 1 if true. In similar fashion, lines 560-580 handle motion downward, left, and up, respectively (each with wrap-around).

```
550 IF S/2=INT(S/2) THEN Y=Y-1+P%(Y=0)
560 IF S=9 OR S=13 OR S=5 THEN Y=Y+1-P%(
Y=P)
570 IF S>8 AND S<13 THEN X=X-1+P%(X=0)
580 IF S>4 AND S<9 THEN X=X+1-P%(X=P)
```

Line 590: Tests for activity from Joystick #2 which controls the color. If there is no response, the drawing routine returns to whichever routine called it - human drawing or computer drawing.

```
590 V=STICK(1):IF V=15 THEN RETURN
```

Line 600: Only reached if attempt is made to change the colors. V will contain the number corresponding to the position of Joystick #2. W tests for the pressing of the fire-button: 0=yes, 1=no. This number is doubled since luminance may take on only even values.

```
600 W=STRIG(1)%2
```

Lines 610-690: Change the colors by either adding 1 to Hx or 2 to Lx, depending on whether or not button #2 is pressed. Checks are made to see if either value has reached 16. If so, it is reset to zero.

```
610 IF V=14 THEN H4=H4+1-(W=0):L4=L4+2-W

620 IF H4=16 THEN H4=0
630 IF L4=16 THEN L4=0
640 IF V=11 THEN H1=H1+1-(W=0):L1=L1+2-W

650 IF H1=16 THEN H1=0
660 IF L1=16 THEN L1=0
670 IF V=7 THEN H2=H2+1-(W=0):L2=L2+2-W
680 IF H2=16 THEN H2=0
690 IF L2=16 THEN L2=0
```

Line 700: makes the actual color changes.

```
700 SETCOLOR 0,0,0:SETCOLOR 1,H1,L1:SETC
OLOR 2,H2,L2:SETCOLOR 4,H4,L4:RETURN
```

Lines 800-820: Routine to let computer do the drawing. T=0 simulates the pressing of button #1; S simulates the movement of the stick in one of the 8 directions; a test is made to see if the human wishes to resume drawing (has he pushed STICK(0)?). Line 810 simulates an occasional "lifting of the crayon", setting T=1 causes cursor motion without drawing. You may wish to experiment with values other than 0.1 in line 810. L is a randomly chosen length for each line.

```
800 T=0:S=5+INT(RND(0)%10):IF STICK(0)<1
5 THEN 100
810 IF RND(0)<0.1 THEN T=1
820 L=2+RND(0)%10:FOR I=1 TO L:GOSUB 520
:NEXT I:GOTO 800
```

Line 900 does the actual drawing. The first PLOT command draws a point at the cursor position. The second PLOT draws a reflection of the first in the Y-axis. The third draws the reflection across the center, and the fourth draws the reflection across the X-axis. Finally, X and Y are swapped. Notice that line 520 sends us here twice. The first time, when X and Y are swapped, it is in preparation for drawing the second group of four dots. Each of these will be reflections in the main diagonals of the first four. The second time through this subroutine, the swapping of X and Y restores them to their proper values.

```
900 PLOT X+A,Y:PLOT 0-X,Y:PLOT 0-X,P-Y:P
LOT X+A,P-Y:Z=X:X=Y:Y=Z:RETURN
```

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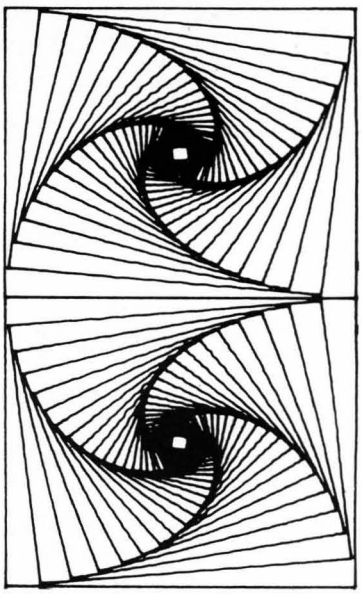

THREE D

Create 3-dimensional graphics!

by Mark Pelczarski

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Hidden Colors in Graphics 8

by James Garon

A new Atari concept and sample programs requiring 16K and a joystick.

In GRAPHICS 8, we are told, there can be only two shades of a single color: one shade for the background and the other shade for the drawing. Normally this is true, however, it is possible to create additional colors in GRAPHICS 8. The secret lies in the fact that to create a white dot against a black background, for example, the computer actually draws a yellow dot next to a blue dot (colors may vary depending on TV). This double-dot appears white to the eye. Yellow is plotted whenever the first number (X) in the PLOT X,Y command is an even number (0, 2, 4,...316, 318). Blue is plotted in the odd-numbered columns of the GRAPHICS 8 screen (1, 3, 5,...317, 319).

Therefore, if we draw a figure only in the even-numbered columns, or if we draw the figure normally and then erase all odd-numbered columns, the figure will appear yellow. Similarly, a blue figure will consist entirely of points which lie in odd-numbered columns.

It is useful at this point to consider the way that DRAWTO handles lines which are almost vertical. For instance, if X is an even number and we PLOT X,0 and then DRAWTO X+1,159 the result will be a yellow line which begins at X,0 and drops straight down to X,79 and a blue line which starts at X+1,80 and continues down to X+1,159. Placing many of these lines in a row across the screen, and making sure that X is always an even number, will give us two colored rectangles:

```
10 F.X=0 TO 318 STEP
2:PL.X,0:DR.X+1,159:N.X
```

If we allow the DRAWTO lines to become slightly less vertical, we will then be drawing several alternating bands of color across the screen:

```
10 F.X=2 TO 310 STEP
2:PL.X,0:DR.X+9,159:N.X
```

Now that we know how to obtain blue and yellow in GRAPHICS 8, we can combine these colors with the two shades of the background color to get a total of four colors. The first program (listing #1) uses the technique we have outlined to draw a checkerboard in blue and yellow, give it a border, and place the black and the white checkers upon their correct squares.

When the drawing is complete, two SETCOLOR statements will appear in the text window. These are the SETCOLORS currently being used. Using joystick #1, you can experiment with changing these SETCOLOR statements and observe their effects on the picture. Pressing left or right will change the hue of COLOR 0 or COLOR 1 respectively. Notice that the computer ignores the hue of COLOR 0 (the middle number in the SETCOLOR 1,A,B command). Pressing left or right with the fire-button held down will alter the luminance of COLOR 0 or COLOR 1. There are over 1000 different color combinations.

Listing #2, CHECKER CHALLENGE, will give you a chance to solve a solitaire puzzle with the checkers. All you have to do is move the black checkers to the squares now occupied by the white checkers and vice versa. Sound easy? There are only three rules:

1) You must use legal checker moves and alternate black and white (the color of the blinking cursor is the color of the checker you must move next.)

2) No jumps are allowed

3) There are no kings (no backward moves!)

To move a checker, use joystick #1 to position the cursor in the same square as the checker you wish to move. Now press the fire-button. Half of the checker should disappear. Move the cursor to the square to which you plan to move. Press fire. If the move is legal, the rest of the checker will be removed from the old square, and the checker will be redrawn in the new square. The cursor will now change color. Continue moving checkers until either you are hopelessly blocked and have no further moves or until you win (SCORE=24). You receive one point for each checker that successfully reaches one of the last three rows opposite its starting side.

Since CHECKER CHALLENGE uses control character graphics that cannot be printed, use the following to discover what to type on lines 240-260 and 2000-2009.

Symbol	Meaning
b	blank
d	ESC followed by CTRL = (looks like down-arrow)
l	ESC followed by CTRL + (looks like left-arrow)
=	SHIFTed equal sign (appears as vertical line)

Any capital letter should be typed with the CTRL key held down (Q means CTRL Q, etc.).

Lines 240-260 contain the graphics for the word SCORE:

```
240 ? "bbbbbbbb
QREQREQREQREQREI"
250 ? "bbbbbbbbZRE=
bb=b=AWCARb"
260 ? "bbbbbbbb
ZRCZRCZRCZRCZRCK"
```

Lines 2000-2009 contain graphics for the numerals zero through nine:

```
2000 ? "QREdlll=b=dlllZRC"
2001 ? "bbEdl=dlX"
2002 ? "QREdlllQRCdlllZRA"
2003 ? "QREdlnRDdlllZRC"
2004 ? "WbWdlllZRSdlX"
2005 ? "QREdlllZREdlllZRC"
2006 ? "QREdlllAREdlllZRC"
2007 ? "QREdl=dlX"
2008 ? "QREdlllARDdlllZRC"
2009 ? "QREdlllZRDdlllZRC"
```

Listing #1

```
5 GRAPHICS 8:H1=0:L1=14:H2=0:L2=0:SETCOL
OR 1,H1,L1:SETCOLOR 2,H2,L2
10 COLOR 1:FOR X=20.5 TO 294 STEP 2.06:P
LOT X,0:DRAWTO X+9,159:NEXT X
20 COLOR 1:FOR X=19 TO 12 STEP -1:PLOT X
,0:DRAWTO X+9,159:PLOT 312-X,0:DRAWTO 32
1-X,159:NEXT X
30 FOR Y=8 TO 0 STEP -1:PLOT 14,Y:DRAWTO
 300,Y:PLOT 21,159-Y:DRAWTO 306,159-Y:NE
XT Y
40 COLOR 1:FOR Q=59 TO 263 STEP 68:U=12:
U=Q:GOSUB 100:U=Q-33:U=30:GOSUB 100:U=Q+
2:U=48:GOSUB 100:NEXT Q
50 COLOR 0:FOR Q=30 TO 234 STEP 68:U=101
:U=Q:GOSUB 100:U=Q+35:U=118:GOSUB 100:U=
Q+2:U=137:GOSUB 100:NEXT Q
60 POKE 752,1:POKE 656,1:POKE 657,13:? "
C H E C K E R S"
```

continued on page 74

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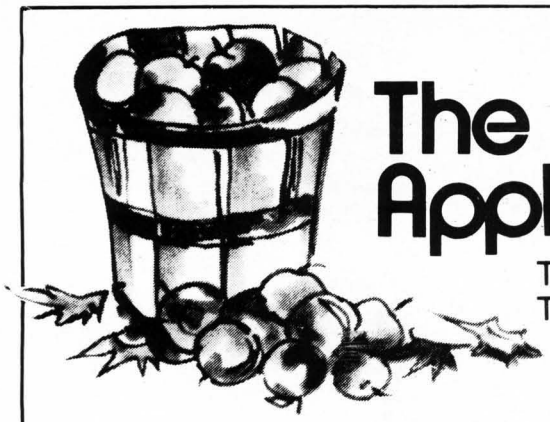

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HIDDEN COLORS
continued from page 69

```
70 FOR I=1 TO 20:NEXT I:S=STICK(0):T=STR
IG(0):IF S=11 THEN H1=H1+T:L1=L1+(T=0)*2
80 IF S=7 THEN H2=H2+T:L2=L2+(T=0)*2
90 H1=H1-16*(H1=16):H2=H2-16*(H2=16):L1=
L1-16*(L1=16):L2=L2-16*(L2=16)
94 SETCOLOR 1,H1,L1:SETCOLOR 2,H2,L2:POK
E 656,2:POKE 657,3
96 ? "SETCOLOR 1,";H1;",";L1;"  ","SETCO
LOR 2,";H2;",";L2;"  ";
99 GOTO 70
100 RESTORE :OLDA=0:Y=-1:FOR I=1 TO 40:R
EAD A,B:IF A<OLDA THEN Y=Y+1
110 PLOT A+U,Y+V:DRAWTO B+U,Y+V:OLDA=A:N
EXT I:RETURN
1000 DATA 11,17, 6,10, 18,22, 3,5, 12,16
, 23,25, 1,2, 7,21, 26,27, 0,0, 4,24, 28
,28, 0,2, 7,21, 26,28, 0,5, 12,16
1010 DATA 23,28, 0,3, 5,10, 18,23, 25,28
, 0,3, 5,6, 10,18, 22,23, 25,28, 1,3, 5,
6, 10,11, 17,18, 22,23, 25,27
1020 DATA 3,6, 10,11, 17,18, 22,25, 6,11
, 17,22, 11,17
```

Listing #2

```
5 GRAPHICS 8:SETCOLOR 1,0,14:SETCOLOR 2,
0,0:DIM B(32):SC=-1
10 COLOR 1:FOR X=20.5 TO 294 STEP 2.06:P
LOT X,0:DRAWTO X+9,159:NEXT X
20 COLOR 1:FOR X=19 TO 12 STEP -1:PLOT X
,0:DRAWTO X+9,159:PLOT 312-X,0:DRAWTO 32
1-X,159:NEXT X
30 FOR Y=8 TO 0 STEP -1:PLOT 14,Y:DRAWTO
 300,Y:PLOT 21,159-Y:DRAWTO 306,159-Y:NE
XT Y:GOTO 200
99 COLOR B(C):RESTORE :AA=0:Y=-1:FOR I=1
 TO 40:READ A,B:IF A<AA THEN Y=Y+1
100 PLOT A+U,Y+V:DRAWTO B+U,Y+V:AA=A:NEX
T I:RETURN
200 POKE 752,1
210 FOR I=1 TO 12:B(I)=2:B(I+20)=1:NEXT
I:FOR I=13 TO 20:B(I)=0:NEXT I
220 FOR C=1 TO 32:IF B(C)>0 THEN GOSUB 9
00:GOSUB 99
230 NEXT C:P=1:C=15
240 ? "                              "
250 ? "           |  | |       "
260 ? "                              "
270 ? "  C H E C K E R   C H A L L E N G
 E";:GOTO 380
310 GOSUB 700:IF B(C)<>P THEN 310
320 COL=0:FOR I=U-1 TO U+13:COL=1-COL:CO
LOR COL:PLOT I,V-1:DRAWTO I,V+11:NEXT I:
FROM=C:UU=U:VV=V:GOSUB 700
330 IF C=FROM OR B(C)>0 THEN C=FROM:GOSU
B 900:GOSUB 99:GOTO 310
350 IF ABS(U-UU)>36 OR (P+P-3)*(U-UU)<>1
8 THEN C=FROM:GOTO 330
360 T=C:C=FROM:GOSUB 900:C=T:COL=0:FOR I
=U+13 TO U+29:COL=1-COL:COLOR COL:PLOT I
,V-1:DRAWTO I,V+11:NEXT I
370 B(FROM)=0:B(C)=P:GOSUB 900:GOSUB 99:
P=3-P
380 SCORE=0:FOR I=1 TO 12:IF B(I)=1 THEN
 SCORE=SCORE+1
390 NEXT I:FOR I=21 TO 32:IF B(I)=2 THEN
 SCORE=SCORE+1
400 NEXT I:IF SCORE=SC THEN 310
410 GOSUB 500:SC=SCORE:POKE 656,0:POKE 6
57,27:X=INT(SCORE/10):Y=SCORE-10*X:IF X=
0 THEN 430
420 GOSUB 2000+X:POKE 656,0:POKE 657,30
430 GOSUB 2000+Y:IF SC<24 THEN 310
450 POKE 709,6:FOR I=0 TO 14 STEP 2:FOR
J=0 TO 14 STEP 0.1:SETCOLOR 2,J,I:NEXT J
:NEXT I:GOTO 450
460 GOTO 460
500 FOR I=0 TO 2:POKE 656,I:POKE 657,27:
? "       ";:NEXT I:RETURN
700 GOSUB 900:POKE 77,0
710 COLOR P:GOSUB 950:COLOR 3-P:GOSUB 95
0:S=STICK(0)
720 IF S=11 AND INT((C-1)/4)<>(C-1)/4 THE
N C=C-1:REM
730 IF S=7 AND INT(C/4)<>C/4 THEN C=C+1:R
EM
740 IF S/2=INT(S/2) AND C>4 THEN C=C-4:R
EM
750 IF S-1=INT((S-1)/4)*4 AND C<29 THEN
C=C+4:REM
760 IF STRIG(0)=0 THEN RETURN
800 GOTO 700
899 REM *  GET U,V FOR PLOT; C   U,V
900 V=INT((C-1)/4):U=C-4*V:U=68*U+V-8-35
*(V>2)*INT(V/2):V=18*V+11:RETURN
950 FOR I=U+P-3 TO I+2 STEP 2:PLOT I,V-2
:DRAWTO I,V:NEXT I:RETURN :REM CURSOR DR
AW
1000 DATA 11,17,6,10,18,22,3,5,12,16,23,
25,1,2,7,21,26,27,0,0,4,24,28,28,0,3,7,2
1,26,28,0,5,12,16,23,28,0,3,5,10
1010 DATA 18,23,25,28,0,3,5,6,10,18,22,2
3,25,28,1,3,5,6,10,11,17,18,22,23,25,27,
3,6,10,11,17,18,22,25,6,11,17,22
1020 DATA 11,17
2000 ? "       | |       ";:RETURN
2001 ? "      |   ";:RETURN
2002 ? "                 ";:RETURN
2003 ? "               ";:RETURN
2004 ? "             ";:RETURN
2005 ? "                 ";:RETURN
2006 ? "                 ";:RETURN
2007 ? "      |  ,";:RETURN
2008 ? "                 ";:RETURN
2009 ? "                 ";:RETURN
```


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DR. LIVINGSTON IN SEARCH OF . . .

Last month we presented Dr. Livingston , In Search of . . . , an S-80 program. We purposely left out the documentation to give you a chance for some true adventuring. If you've not yet rescued Dr. Livingston, then you should skip this article!

by Ralph and Becky Fullerton
Carl and Karen Russell

GOAL - Return all objects to the bedroom (except as noted below). The closet must be open since you are actually dropping the objects into the closet. You can carry no more than five objects at any one time. This does not include the boots.

LIVINGSTON & BOOTS - To survive in Africa you must be wearing them. When you OPEN the closet and GET the BOOTS, Dr. Livingston is created in one of the three possible locations. 37½% of the time he will be in the PIT (location 35, see map). The rest of the time he will be either just off from the quicksand (25% or in the marshes (27%). To GET Dr. LIVINGSTON, first say "GET LIVINGSTON". The computer responds "Dr. Livingston?". You must then say "I PRESUME". He is then an object that you are carrying.

You may have tried to return Dr. Livingston to the bedroom by way of the cave password. It won't work. You and your other objects make it, but Livingston is randomly placed in a location numbered above 2. You must find him again and return him to the bedroom by way of the boat.

BEDROOM EXITS - There are two ways out of the bedroom. Clues to the first way can be found by reading the PASSAGE located in the BOOK. GET BOOK, OPEN BOOK, READ PASSAGE (being sure you are in bed). What you see is a segment of a sentence, the first and last words cut in two. The key word here is the last full word: DRIFT. You must be in bed with the book for it to work. The BOOK always stays in the bedroom. See SWAMI below.

KNAPSACK, MOUSE, LEOPARD - You need the KNAPSACK to GET the MOUSE. FREE The MOUSE at 9 or 10 to scare away the LEOPARD.

SWAMI - This is the second password connecting the bedroom (1) and the Mouth of the Cave (10). The clues for this are several. The NOTE in the Hut (18) says SWAMI DIAMOND. A voice heard in the Cavern (12) comes from the MOUTH OF THE CAVE, where the DIAMOND is located. The DIAMOND is not located at 14, another MOUTH OF THE CAVE. It is there to confuse you. Put the clues together and you get SWAMI, a secret word to move from 1 to 10 and back.

MOVEMENT - Several locations use RND(X) to allow movement in certain directions. You have one chance in four to get out of location 12 using any direction. There is a 50% chance of movement from 6 going N, or W. Until the Leopard is gone you can't connect 9 and 10. Going E from 22 gets you equally either to 21 or 19. N is the only exit from the marsh (37½% chance). Notice that N is the only direction that responds with "You can't go that way.", or similar response. Just a slight clue. 37½% of the time you can go N or E and get to 20 from 25. The only way to connect 23 and 24 is to "JUMP QUICKSAND" and then respond "YES" to the next prompt: "Do you really expect . . . ". To get into the Ujiji Village, you must come from 32, a 40% chance.

DEATH - Death results from several situations. If you DRIFT or SWAMI barefooted, you die. That's the end of the game. This can happen only on your first exit from the bedroom that game. To have survived a previous exit you had to be wearing the boots. The boots are on for good.

Spending too much time with a wild DOG, vicious VIPER, ALLIGATOR, or hostile villagers results in death. The villagers are only hostile if you are carrying a spear. A 'timed' death always recovers the first time and half the time thereafter (50% chance). On death you are relocated into the boat (2), while any objects you were carrying are randomly distributed to locations numbered above 3.

TRADING of goods takes place at two places: the first village (17) and the trading post (29). BEANS are traded at the village (TRADE BEANS), and are then replaced by the RING. You trade GROUNDNUTS at 29, but remember to GET CHAIN.

ALLIGATOR - It is killed by the SPEAR or DAGGER (sometimes) but there are other alligators nearby. So if you leave the Marsh and return later, another ALLIGATOR is there to greet you.

SUGAR CANE, WILD DOG, VICIOUS VIPER, SAPPHIRE - Holding the CANE for a total of 17 turns changes it into a flute (you used your penknife). This is all you need to CHARM the VIPER. GET VIPER and FREE it to attack the DOG (22). They both end up in the quicksand, but the scuffle uncovers a SAPPHIRE in the grass. If you have not found the VIPER, it is in the tree (7) just off the trail (6).

****** - Don't forget the NOTE and the CORN. Everything not traded or given up for something better is needed to attain that 215 point goal. When it is reached, then the number of turns you took determines how many bonus points you get.

EXTRAS EXTRAS

You can CHARM the VIPER with the CANE before the CANE becomes a FLUTE. Carrying the SPEAR you can make it into the village (17), trade the BEANS, enter the hut, get the NOTE, and get out of the village before you die, but don't linger.

VARIABLES

Strings are A-G Integers are H-Z

Y - You: where you are, your location, your 'room #'. Used by P( ) & P$( ) mainly.

P$(#) - A description of your location; # being that location's 'room #'.

P(#,X) - Possible directions (actually equal to the possible room #) you can take from room

#. X+0-5 and respectively represents N, S, E, W, U, D. EX: If you are in room 5 and say "GO EAST" then the program will check the value of P(5,2) and act from there. See MOVEMENT CHART.

PM - Total number of locations (rooms).

A - General input by player to a prompt.

R$ - 'TIS DONE: the general "O.K." response.

I and J - Temporary counters used throughout.

VM - Total number of verbs; (VM means Verb Max, the maximum number of verbs).

NM - Total number of nouns.

IM - Total number of items (objects).

V$(#) - The actual verb.

V - The number of a particular verb (from the verb list).

N$(#) - The actual noun.

N - The number of a particular noun (from the noun list).

I$(#) - Item description.

IL(#) - Item location, at any given time.

IP(#) - Item point value (when returned to room #1).

IN(#) - The number of the particular noun that corresponds to object #.

Some temporary values: B, C, D, G, GN,, GV, Z, Z1, and others (used mainly in response evaluations).

V5+0 - Vicious Viper.

V5+1 - Lethargic Viper.

X+0 - Knapsack closed.

X+1 - Knapsack open.

K+0 - Closet closed.

K+1 - Closet open.

T - Turn counter; number of turns taken at present.

X1 and X2 used in 'Wild Animal' routine.

X7 - Code used to see if you are in the village for the first time or not

XF+0 - Chain unobtainable.

XF+1 - Chain obtainable.

XD - The number of times you remain in a danger area (like the number of times in a hositle village).

XG+1 - Beans exist.

XG+0 - Ring exists.

XE+0 - Boots off.

XE+1 - Boots on.

N4+0 - Cane exists.

N4+1 - Flute exists.

N5 - The number of turns you have had the Sugar Cane.

S - Score.

ST - Temporary Score.

MI - Total number of items presently in your possession.

XC+0 - Book closed.

XC+1 - Book open.

XB+0 - Not in bed.

XB+1 - In bed.

G1 - "You already have it."

G2 - "You're on your own."

G3 - "Don't be silly."

G4 - "That's too dangerous."

G5 - "It's nowhere in sight."

G6 - "You don't have it."

G7 - "Nothing unusual. "

G8 - "With your puny spear?"

G9 - "You had better leave fast."

GA - " Neither are seen again."

GB - "The native takes your"

GC - "You are lying in a warm soft bed."

GD - "You are at the closet."

GE - "Several natives wave hello!"

Negative numbers and 98 represent special random movement sections or other special conditions.

MOVEMENT

Room No.	N	S	E	W	U	D
1	0	0	0	0	0	0
2	0	0	3	0	0	0
3	0	5	4	2	0	0
4	5	6	4	3	0	0
5	3	0	6	4	0	0
6	-5	8	-4	-5	7	0
7	0	0	0	0	7	6
8	6	15	9	0	0	0
9	0	0	0	8	98	0
10	0	0	11	0	0	98
11	0	0	12	10	0	13
12	-11	-11	-11	-11	-11	-11
13	11	0	14	15	0	0
14	0	0	0	13	0	28
15	0	0	16	8	0	0
16	15	19	17	19	0	0
17	16	18	0	0	0	0
18	17	0	0	0	0	0
19	16	22	20	21	0	0
20	0	26	26	19	0	0
21	21	23	22	21	21	21
22	21	22	-1	23	22	22
23	98	22	98	21	23	23
24	24	98	25	98	24	24
25	-20	25	-20	24	25	25
26	20	27	30	20	0	0
27	-26	27	27	27	27	27
28	0	30	29	0	14	0
29	0	0	0	28	0	0
30	28	26	0	31	0	0
31	30	32	33	31	0	0
32	31	0	98	31	0	0
33	0	0	0	31	0	0
34	34	34	34	32	0	35
35	0	0	0	13	34	0

Example: Going South from room 16 puts you in room 19. A 0 means you cannot go that direction. So from room 16 you are unable to go Up or Down.

LANGUAGE

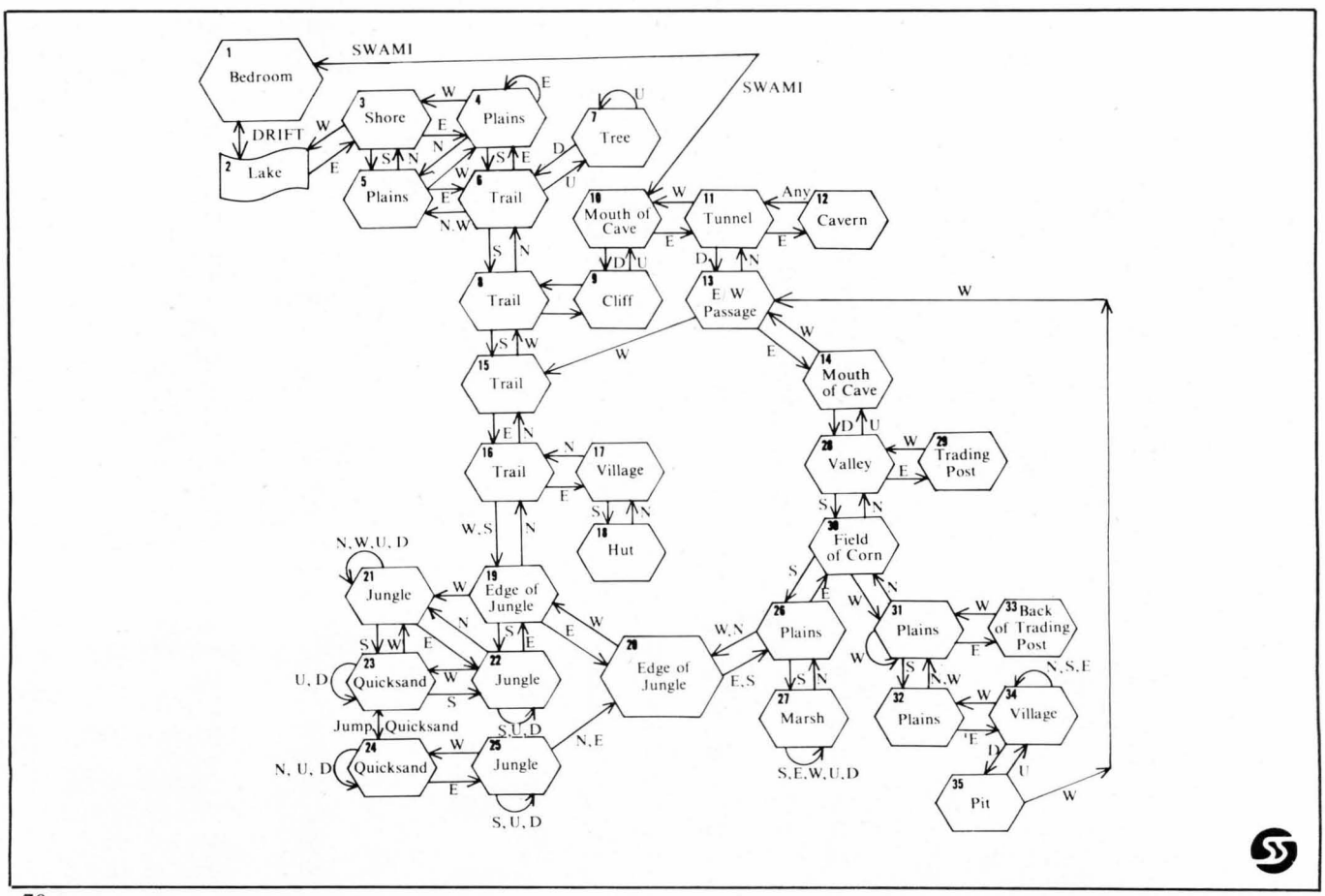
VERB # - V	ACTUAL VERB V$ (#)
1	GET
2	DROP
3	I
4	OPEN
5	CLOSE
6	DRIFT
7	SWAMI
8	LOOK
9	THROW
10	HINT
11	READ
12	GO
13	INVEN (TORY)
14	TRADE
15	KILL
16	FREE
17	CHARM
18	JUMP
19	SCORE
20	ROW
21	ENTER
22	CATCH
23	EXIT
24	CLIMB
25	EAT
26	FEED
27	QUIT

NOUN # - N	ACTUAL NOUN N$ (#)
1	N
2	S
3	E
4	zw
5	U
6	D
7	NORTH
8	SOUTH
9	EAST
10	WEST
11	UP
12	DOWN
13	KNAPS (ACK)
14	SPEAR
15	FLUTE
16	VIPER
17	TREE
18	MOUSE
19	SIGN
20	BOOK
21	BOAT
22	CLOSE (T)
23	BED
24	BOOTS
25	PASSA (GE)
26	RING
27	LEOPA (RD)
28	DIAMO (ND)
29	VILLA (GE)
30	TRINK (ETS)

31	CANE	39	CORN	ONLY THE FIRST FIVE LETTERS OF ANY WORD ARE USED.
32	DOG	40	GROUN (DNUTS)	
33	ALLIG (ATOR)	41	PIT	
34	SQUIR (REL)	42	BEANS	
35	DAGGE (R)	43	QUICK (SAND)	The verbs are used as program keys, line 1600 being the pivot point.
36	NOTE	44	NATIV (E)	
37	CHAIN	45	SAPPH (IRE)	
38	LIVIN (GSTON)	46	HUT	

OBJECTS

ITEM #	ITEM DESCRIPTION	I$(#)	LOCATION	(IL(#)	SCORE IP(#)	NOUN COMP. IN (#)
1	A TIMEWORN BOOK		1		0	20
2	A FADED RED KNAPSACK		1		2	13
3	EARS OF CORN		30		5	39
4	A BATCH OF GROUNDNUTS		33		5	40
5	A TINY GREY MOUSE		2		7	18
6	A POISON-TIPPED SPEAR		0		3	14
7	A PAIR OF HIKING BOOTS		1		50	24
Changes to:	DR. LIVINGSTON		Random: 25,27,35		50	38
8	A VICIOUS VIPER		7		0	16
Changes to:	A LETHARGIC VIPER		7		0	16
9	A SPARKLING DIAMOND		10		15	28
10	A SACK OF COFFEE BEANS		15		12	42
Changes to:	A GOLDEN NOSE RING		-1		12	26
11	A CRUMPLED NOTE		18		3	36
12	A SOLID SILVER CHAIN		29		15	37
13	STALKS OF SUGAR CANE		24		15	31
Changes to:	A CHARMING LITTLE FLUTE		-1		15	15
14	A HUNGRY ALLIGATOR		27		0	33
15	A WILD DOG		22		10	32
Changes to:	A DEEP BLUE SAPPHIRE		22		10	45
16	A PEARL-HANDLED DAGGER		12		10	35



PROBLEM.

INT(X^N+X SIN(X^2),X)

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Trigonometric simplifications? But of course. Just type:

```
?SIN(2*Y) *
(4*COS(X) 3 -
COS(3*X)=SIN(Y) *
COS(X=Y=#P1) -
COS(X-Y); Then
```

instantly muMATH returns:

```
@4*SIN(Y)*COS(X) *
COS(Y).
```

Adding fractions? Need you ask?

```
?1/3=5/6=2/5=3/7;
@419/210.
```

muMATH is written in muSIMP, which is included in the muMATH package. muSIMP is an applicative, recursive langauge, ideal for describing complex mathematical concepts.

Because of its highly interactive nature and hierarchical structure, muMATH is an excellent math teaching device, from simple arithmetic to calculus.

* muMATH is currently available for the CP/M® operating system.

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* **PLEASE NOTE: The CPM version of muMATH is not available from The Software Exchange.**

MasterCard VISA

COMPUTER GRAPHICS
continued from page 61

```
2020  RETURN
3000  REM  COMPUTE THE CENTER POI
    NTS
3010 XS = 280:YS = 192:XL = 0:YL =
    0
3020  FOR J = 1 TO NPTS
3030  IF X(J) < XS THEN XS = X(J)

3040  IF X(J) > XL THEN XL = X(J)

3050  IF Y(J) < YS THEN YS = Y(J)

3060  IF Y(J) > YL THEN YL = Y(J)

3070  NEXT J
3080 XC = (XS + XL) / 2:YC = (YS +
    YL) / 2
3090  RETURN
]
```

BUGS, WORMS, AND OTHER UNDESIRABLES
by Kay Pasa

In "Encounter in the Near Tholian Sector", (**SoftSide S-80** May, 1980) there should be an additional statement added to the end of line 40:

The corrected statement must be executed AFTER GOSUB 650 because the subroutine resets variable B.

Also, if it seems as though the program doesn't work, make sure you have typed it in EXACTLY as it appears, including the commas used for THEN statements and the spaces. It will make a difference.

Joe Sewell

In the July **SoftSide S-80**, page 24 was very difficult to read. If the Pinball program doesn't work properly, it may be due to some smeared characters on this page. We will be glad to send a clear copy of the offending page to those requesting it. Send your request to:

Kay Pasa
c/o SoftSide
6 South Street
Milford, NH 03055

In that same issue the line printer hiccupped at line 2901 of ADVENTURE INTERPRETER (page 47). The line should read simply: 2901' with the apostrophe being the abbreviation for ":REM"

In the August **Prog-80** the listing of SPLAT! mysteriously vanished. Whie SPLAT! runs VERY slowly in BASIC, you may have a copy of the listing by sending your request to

KAY PASA
c/o SoftSide
6 South Street
Milford, NH 03055

In the Apple Concentration program in the August **SoftSide**, page 75, line 1510 should read:
1510 IF PEEK (-16287+P) =127 THEN 1540

The 1540 somehow disappeared from our magazine.

-Kay

In the September issue part of line 100 of "Dr Livingston" is illegible. The offending portion should read:

PM=35:VM=27

Oooops! In the article "You can have SOUND on your computer" in the August, 1980 issue of **SoftSide**, I neglected to mention that the MEMORY SIZE? question should be answered with 32511 before the S-80 version of the program is typed in and run. For those of you working from NEWDOS, enter Basic by typing 'BASIC 32511' which is equivalent to answering this question, the computer will sometimes lock up and refuse to respond to any user prompting. I apologize for any inconvenience this may have caused anyone.

Richard Bouchard Jr.

APPLE PROGRAMMING HINT

Here's a free way to protect yourself from accidentally hitting reset! First, take the RESET key off your Apple. The best way to do this is to hold down RETURN, take a butter knife and slowly pry the key off. Now remove the cover of the Apple. Next, under the lip of the key switch, wrap a medium-sized rubber band around a few times. Then take the loose end of the rubber band and stick it through the vents on the baseboard directly below the RESET key. Take a short pencil or a toothpick and slip it through the rubber band so that the rubber band snaps back and holds the pencil to the bottom of the Apple. You now have a RESET key that won't do a reset unless you really press it hard.

NOTE: This procedure may void your Apple's warranty.

Rich Crisafulli
E. Dennis, Mass.

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muMATH

muMATH - an S-80 review by James Garon

Inside the 6" x 8" x 1¼" box is a binder containing two diskettes and a 76-page instruction booklet. One diskette is for S-80 s with 32K of memory, the other - with several additional features - is for 48K systems. "muMATH is ideally suited for interactive, practical use by engineers, scientists and mathematicians," the booklet states. It goes on to say, "It is also an excellent self-teaching tool for students interested in the standard mathematics curriculum from elementary arithmetic through calculus."

One of the first things you are asked to do as you read the instruction booklet is to make a backup copy of the muMATH diskette. Step 5 of this process directs you to type "BACKUP" from DOS (muMATH is supplied on TRSDOS). However, the BACKUP utility was missing from the 48K muMATH diskette. This was just a minor annoyance to me, since I was able to use the BACKUP from the 32K diskette to make a copy of the 48K version; but the omission might prove traumatic to those unfamiliar with the ways of DOS.

I had been intrigued by the muMATH ads that claimed 611-digit accuracy for arithmetic results, so I began with some factorial experiments. In response to muMATH's prompt (a question mark), the user simply types in the problem followed by a semicolon (;) and then presses ENTER. I typed, "50!;" and in just over a second the computer printed out the complete 66 digit answer. 296 factorial proved to be the largest that muMATH could handle. This one took about 48 seconds to compute and print the answer - all 617 (!) digits.

muMATH works with rational expressions exclusively. This means that decimals such as 1.23 are unacceptable as input and will never occur as output. This is great for working with fractions; asking muMATH to add 5/10 + 1/3 yields the answer 5/6.

Most impressive was the expansion by muMATH of the binomial $(A+B)^5$ into the 6 correct terms in about 11 seconds. It took quite a bit longer, but muMATH handled $(A+B+C+D)^4$ with equal ease.

muMATH allows you to define equations, manipulate each side, evaluate expressions for various values of the variable(s), combine like terms, expand, factor, and simplify (by combining like terms, for example). It will find Greatest Common Divisors and Least Common Multiples of any two integers.

I found it fascinating that muMATH allows you to work in 35 different number bases - not just the standard binary, octal, decimal and hex, but any base from 2 through 36 inclusive! In base 36, the digits 0 through 9 are used as well as all 26 letters of the alphabet. On page 25 of the instruction booklet there is a cute example that is unfortunately marred by a typo: the decimal number 13881684805, when expressed in base 36 is supposed to equal the "number" MUMATH. It doesn't. After a few head-scratching, figure-scribbling moments, I discovered the problem. The correct decimal number with which to begin does not have a double eight: 1381684805. Does even mighty Microsoft suffer from kkeybounce?!

muMATH handles with ease just about every algebraic problem one is likely to encounter, and does so with enormous flexibility. You tell muMATH whether to factor or to expand. You may factor only in the numerators of expressions, only in the denominators, both, or neither.

With either the 32K or 48K version of muMATH, you can process problems involving logarithmic and trigonometric operations (simplification or expansion). With the 48K version you can proceed into the realm of calculus in which muMATH handles integration as well as ordinary and partial differentiation with ease. For instance, to differentiate AX^2 with respect to X, simply type:

DIF (A*X 2, X); and the answer appears:

2*X*A

Higher order partial derivatives can be found by "nesting" the appropriate DIFs:

DIF(DIF(SIN(X*Y),X),Y); yields:
-X*Y*SIN(X*Y)+COS(X*Y).

Integration is just as easy: To find the indefinite integral of 2X-1/X with respect to X, type:

INT(2*X-1/X,X) and in a few seconds muMATH responds with X 2 - LN(X) (The constant of integration is suppressed).

Chapter 5 of the instruction booklet contains a brief introduction to programming in muSIMP (microcomputer Structured IMPlementation language), the langugage in which muMATH is written. This introduction should be enough to allow most users to program their own functions. These may be stored on disk and later read in to enhance the basic muMATH package.

Examples are provided which range from simulating BASIC commands such as FOR/NEXT and IF/THEN/ELSE, through graphics (!) to teaching muMATH to calculate Taylor series polynomials to any desired degree (a short 13-line program!). For a more detailed treatment of muSIMP, the user is referred to the muSIMP/muMATH Reference Manual which is available from Microsoft (no price given). This manual includes some additional capabilities such as matrix algebra, further integration power and a trace utility.

muMATH even supports a lineprinter. Altogether, the muMATH/muSIMP package is quite amazing - the more math you know, the more you'll appreciate muMATH. While anyone can sit down and use it immediately, it is a package you can grow with, no matter how sophisticated your mathematical abilities and needs.

Imhotep
continued from page 21

IMHOTEP S-80 VERSION

Lines 10-20: Title and copyright

```
10 '* IMHOTEP - PYRAMID BUILDER * VERSION 2.5 *
20 '* COPYRIGHT (C) 1980 TERRY CLARK COLUMBUS, IN *
```

Lines 30-40: Clear space for strings and then build some graphic strings for the border design. In line 40, go to the graphics routine, where the introductory picture is drawn.

```
30 CLEAR2000:E$=CHR$(184)+CHR$(189)+CHR$(144):G$=E$+E$+E$+E$:E$=G$+
G$+G$+CHR$(130)+CHR$(139)+CHR$(175)+CHR$(156)+CHR$(179)+CHR$(172
)+CHR$(159)+CHR$(135)+CHR$(129)+G$+G$+G$
40 GOSUB1210
```

Lines 60-140: Clear screen and PRINT the introductory page.

```
50 READB$:P=300000:D=2500:S=330:T=0:W=0:ER=0:N=0:IM$="IMHOTEP":R
ANDOM
60 CLS:PRINT@12,"IMHOTEP   ";G$;G$;"  PYRAMID BUILDER":PRINT@960
,G$;G$;G$;G$;G$;G$;G$;G$;
70 PRINT@87,"BY TERRY CLARK":PRINTE$;:PRINT
80 PRINT"++++ A DECREE FROM ZOSER, THE GOLDEN HORUS, BULL OF KHE
M. ++++"
90 PRINT:PRINT"TO IMHOTEP, MASTER MASON:"
100 PRINT"IMHOTEP, THE PHAROAH HAS COMMANDED A PYRAMID TO BE BUI
LT."
110 PRINT"THE HORUS DESIRES THIS GLORY TO HIS NAME TO"
120 PRINT"BE FINISHED WITHIN A PERIOD OF TWELVE YEARS."
130 PRINT"YOUR OVERSEER IS ";B$;", HE IS TO OBEY YOUR COMMANDS."
:PRINT:PRINT
140 INPUT"(PRESS ENTER TO CONTINUE)";A$
```

line 150: jump to the pyramid drawing routine.

```
150 GOSUB690
```

Lines 160-250: A report on the current state of affairs is PRINTed under the scene of the worksite.

```
160 PRINT@576,"HERE IS THE WORK-SITE AFTER";T;"YEARS OF WORK."
170 PRINTIM$;", THE POPULATION OF KHEMI IS";P;"."
180 PRINT"PHAROAH OWNS";S;"STOREHOUSES OF GRAIN.":PRINT" THE NIL
E FLOODED";D;"TELS OF LAND."
190 PRINT@832,CHR$(31)"FROM THE";P;"PEOPLE YOU COMMAND IN ZOSER'
S NAME,"
200 INPUT"HOW MANY PEOPLE DO YOU WISH ON YOUR WORK FORCE";W
210 IF(W>P)OR(W<0)THEN780
220 PRINT@832,CHR$(31)"FROM THE TOTAL OF";S;"STOREHOUSES OWNED B
Y THE SON OF RA."
230 INPUT"HOW MANY WILL YOU DEVOTE TO FEEDING THE WORK-FORCE.";I
240 IF(I>S)OR(I<0)THEN810
250 P=P-W:S=S-I
```

Lines 260 to 340: The desired actions are INPUT and checked for legality.

```
260 ' * INPUTS *
270 PRINT@832,CHR$(31)"FROM THE REMAINING";S;"STOREHOUSES,HOW MA
NY TO FEED
THE";P;
280 INPUT"PEOPLE";J
290 IF(J>S)OR(J<0)THEN820
300 S=S-J
310 PRINT@832,CHR$(31)"FROM";D;"TELS HOW MANY DO YOU WISH TO PLA
NT";:INPUTB
320 IF(B>D)OR(B<0)THEN840
330 IFB>S*100THEN870
340 IFB>P*10THEN880
```

Line 350: Screen is cleared and borders are PRINTed.

```
350 CLS:PRINT@960,E$;:PRINT@0,E$:H=0
```

Line 360: The storehouses alloted to the workforce are used to determine the number of people fed, at the ratio of one storehouse to 1000 people. If fed too much, the number fed is the same as the total number of workers.

```
360 M=I*1000:IF(M-W)>0THENM=W
```

Lines 370-380: The same is done for the remainder of the population. "R" is used to determine how many people will move here, based on the quality of the chow in Egypt.

```
370 L=J*1000:R=L-P:IFR<0THENR=0
380 R=R+RND(1000)
```

Line 390: If you starve too many people, Zoser will get you.

```
390 IFP-L>P*.45THEN900
```

Lines 400-490: Various random elements are determined here. The harvest and the number of storehouses gained, the chance of war, plague and other catastrophic events are decided and the program jumps to the appropriate sub-routines. Time is advanced in line 470.

```
400 U=RND(40):IFU<4THEN1050ELSEIF(M-W)<0THENPRINT"YOU HAVE STARV
ED";W-M;"WORKERS.":ER=ER+2:GOTO1050
410 Z=RND(50):IF(Z<9)AND(N>4)THEN1130
420 K=RND(3.5):S=S-(B/100)
430 IFN>T*2THENER=ER-1
440 IFER>=0THENO=INT(((S*(RND(0))+(ER*4))/2)):IFO<2THENS=S-O
450 IFER<0THENO=INT((S*(RND(0))/10)):S=S+O
460 IFS<0THENS=0
470 S=S+((B*K)/10):T=T+1
480 D=INT(RND(40)*100+(O*.5)):Q=RND(30):IFQ<8THEN920ELSEIFQ>22TH
EN950ELSEIF(Q>12)AND(Q<18)THEN1010
490 WA=RND(300):IFWA<19THENGOSUB940ELSEIFWA>282THENGOSUB1040ELSE
IF(WA<210)AND(WA>165)THENGOSUB960ELSEIF(WA>75)AND(WA<130)THENGOS
UB1020ELSEIF(WA>255)AND(WA<260)THENGOSUB1030
```

Lines 500-660: The report on the year's progress is displayed, along with a statement on the mood of Pharoah if needed.

```
500 ' * DISPLAY *
510 PRINT"THE HARVEST THIS YEAR WAS";K/10;"STOREHOUSES PER TEL."
520 IFER>=0THEN530ELSEIF(ER<0)AND(O>1)THENPRINT"THE PRIESTS OF A
MEN GAVE ZOSER,";O;"STOREHOUSES OF GRAIN.":H=H+1:GOTO540
530 IFO<2THENGOTO540ELSEIFER>=0THENPRINTO;"STOREHOUSES OF GRAIN
WERE CLAIMED BY THE PRIESTS OF AMEN.":H=H+1
540 PRINT"THE POPULATION INCREASED BY";R;"PEOPLE."
550 P=(L-(L-P))+M+R
560 N=INT(N+(W-(W-M))/90000)
570 IFN>23THENN=23
580 IF(N<23)AND(N>0)THENPRINT"THE WORK FORCE HAS COMPLETED";N;"C
OURSES OF THE PYRAMID."
590 IF(N<23)AND(D<1000)AND(H<6)THENPRINT"THE VIZIERS PREDICT A P
OOR FLOOD NEXT YEAR.":H=H+1:ELSEIF(N<23)AND(D>3700)AND(H<6)THENP
RINT"THE MELTING SNOW OF ETHIOP SWELLS THE NILE THIS SPRING.":H=
H+1
600 IF(N<12)AND(T>6)OR(ER>3)AND(N<23)THENPRINT"PHAROAH IS BOTHER
ED BY YOUR INEFFICIENCY.":H=H+1
610 IFER>7THENPRINT"HE HAS DECREED, THAT FOR YOUR MISTAKES, YOU
WILL BE EXILED TO   THE RED LAND OF THE EAST.":GOTO660
620 IFH<1THENPRINTIM$;", AN UNEVENTFUL YEAR.":ELSEIF(H>4)AND(H<7
)THENPRINTIM$;", A VERY EVENTFUL YEAR."
```

```
630 IFT>=12THEN890ELSEINPUT"(PRESS ENTER TO CONTINUE)";A$
640 IFT=6THENGOSUB1330
650 S=FIX(S):D=FIX(D):P=FIX(P):GOTO150
660 PRINT@912,"IMHOTEP WILL YOU TRY AGAIN?";:FORZZ=0TO3000:V$=IN
KEY$:IFV$="Y"THEN50ELSEIFV$="N"THENGOSUB1300ELSENEXT:GOSUB1300
```

Line 670: END of the program.

```
670 END
```

Lines 680-760: This subroutine is used first to reinitialize the length of the courses, then to clear the screen, draw the horizon, put in some palm trees (?) and then draw the pyramid, course by course.

```
680 ' * PYRAMID *
690 E=16:F=105
700 CLS
710 PRINT@512,STRING$(64,176);:POKE15868,136:POKE15869,184:POKE1
5870,152:POKE15932,178:POKE15933,186:POKE15934,178:POKE15873,191
:POKE15809,191:POKE15745,191:POKE15681,191:POKE15616,151:POKE156
17,191:POKE15618,139:POKE15619,149:POKE15552,174
720 POKE15553,191:POKE15554,189:POKE15555,140:POKE15556,164:POKE
15488,173:POKE15489,144:POKE15490,176:POKE15491,132
730 IFN=0THENRETURN
740 Y=25:FORG=1TON:FORX=ETOFSTEP1.11:SET(X,Y):NEXT:E=E+2:F=F-2:Y
=Y-1:NEXT
750 IFN=23THEN970
760 RETURN
```

Lines 770-1160: Here are the punishments for your errors, which are kept track of in the variable "ER". "H" is used here to keep the screen from being filled to the point of over-scrolling.

```
770 ' * PUNISHMENT *
780 PRINT@576,CHR$(31)IM$;", ZOSER HEARD YOUR FOOLISHNESS. HE HA
S EXILED ";B$;".":ER=ER+1
790 ONERRORGOTO1190
800 READB$:PRINTB$;" HAS BEEN ASSIGNED AS OVERSEER. NOW...":GOTO
200
810 PRINT@576,CHR$(31)IM$;", DO NOT JEST, THE HAWK'S EARS ARE SH
ARP.":ER=ER+1:GOTO220
820 PRINT@576,CHR$(31)IM$;", I, ";B$;", WARN YOU NOT":ER=ER+1
830 PRINT"TO MOCK PHAROAH ZOSER. HIS FLAIL IS SWIFT.":GOTO270
840 PRINT@576,CHR$(31)IM$;", PHAROAH HAS KILLED ";B$;", YOUR OVE
RSEER.":ER=ER+1
850 ONERRORGOTO1190
860 READB$:PRINT"I AM ";B$;", YOU NEW OVERSEER. NOW...":GOTO310
870 PRINT@768,CHR$(31)"THERE IS ONLY ENOUGH GRAIN TO PLANT";S*10
0-1;"TELS.":ER=ER+1:GOTO310
880 PRINT@768,CHR$(31)"THERE ARE ONLY ENOUGH PEOPLE TO PLANT";P*
10;"TELS.":ER=ER+1:GOTO310
890 PRINT@768,CHR$(31)"YOU HAVE RUN OUT OF TIME, ZOSER WANTS YOU
R HEAD.":GOTO660
900 PRINT:PRINT"YOU HAVE STARVED";P-L;"PEOPLE. ZOSER WANTS YOU"
910 PRINT"MUMMIFIED ALIVE IN THE HOUSE OF THE DEAD.":GOTO660
920 Q=RND((P/2)/2000)*RND(100)*RND(100):Q=FIX(Q):PRINT"A PESTILE
NCE DESCENDED FROM AMEN-RE.":H=H+1
930 PRINTQ;"PEOPLE DIED.":P=P-Q:GOTO510
940 Q=INT(RND(0)*P):PRINT"HYKSOS WITH CHARIOTS AND BLADES OF BLA
CK EVIL METAL HAVE
ATTACKED KHEM. ";Q;"PEOPLE HAVE BEEN KILLED.":P=P-Q:H=H+2:RETURN
950 V=RND(50):PRINT"NUBIAN EMISSARIES HAVE BROUGHT TRIBUTE OF";V
;"STOREHOUSES
 OF GRAIN.":S=S+V:H=H+1:GOTO510
960 Q=INT(RND(0)*P):PRINT"ACHEAN BARBARIANS FROM THE NORTHERN SE
A HAVE RAIDED THE DELTA.
";Q;"PEOPLE HAVE BEEN KILLED.":P=P-Q:H=H+2:RETURN
970 PRINT@576,E$;" ";
980 PRINTTAB(7);"IMHOTEP, YOU HAVE FULFILLED THE WISH OF PHAROAH
."
990 PRINTTAB(7);"YOUR REWARD IS THE GREAT BOON OF BEING ENTOMBED
"
1000 PRINTTAB(6);"WITH YOUR LORD AND MASTER, ZOSER, THE GOLDEN H
ORUS.":PRINT@960,G$;G$;G$;G$;G$;G$;G$;:GOTO660
1010 V=RND(50):PRINT"A MILITARY CAMPAIGN LED BY ZOSER HAS BROUGH
T
AN ADDITIONAL";V;"TELS OF LAND INTO THE DOUBLE-KINGDOM.":D=D+V:H
=H+1:GOTO510
1020 V=RND(50)+20:PRINT"MINOAN MERCHANTS HAVE BROUGHT";V;"STOREH
OUSES OF GRAIN TO TRADE
FOR METHODS OF BUILDING AS PRACTICED IN KHEMI.":S=S+V:H=H+2:RETU
RN
1030 V=RND(100):PRINT"THE PHAROAH'S NEW SYRIAN BRIDE BROUGHT A D
OWRY OF";V;"
STOREHOUSES OF GRAIN.":S=S+V:H=H+1:RETURN
1040 V=INT(RND(0)*W):PRINT"A FANATICAL REBEL-PRIEST HAS ESCAPED
WITH
";V;"WORKERS INTO THE WILDERNESS OF THE SINAI.":W=W-V:H=H+2:RETU
RN
1050 IFW=0THENRETURN
1060 U=RND(100)*100:PRINT"THE WORK FORCE HAS REBELLED."
1070 PRINTU;"WORKERS, AND ";B$;", THE OVERSEER, WERE KILLED"
1080 PRINT"BY PHAROAH'S VICTORIOUS ANUBIS SQUADRON."
1090 W=W-U
1100 ONERRORGOTO1190
1110 READB$:PRINT"THE GREAT ZOSER HAS CHOSEN ";B$;" TO BE YOUR"
1120 PRINT"NEW OVERSEER.":H=H+4:GOTO420
1130 Z=RND(2)+2:N=N-Z:W=W-(W*.25):M=W+P
1140 PRINTZ;"COURSES OF THE PYRAMID HAVE COLLAPSED AND ONE-FOURT
H OF"
1150 PRINT"THE WORK FORCE WAS LOST.":H=H+2:GOTO420
1160 N=23:GOTO690
```

Lines 1170-1190: Here are the overseers, and an error trapping routine to keep from running out of them.

```
1170 ' * OVERSEERS *
1180 DATAMENE-PTAH,RA-ANX-TETA,ATUM-ATON,SETEP-EN-RE,RAMOSE,MERI
-ATUM,KA-RES,MAATTUM,MERI-TEHU,TOTHMES,RE-MES-SES,PTAHMES,MERIPA
SHTU
1190 RESTORE:RESUME
```

Lines 1200-1310: The "E$" array is generated here to store the picture for the introduction and the end of the game. It was originally created by simply (and tediously) drawing the picture on a Video Display Worksheet. By referring to a sheet containing the 64 TRS-80 graphic codes, each character was identified and concatenated into a string. Each element of the string array represents a line on the screen. Finally, each element of the array is printed on the screen.

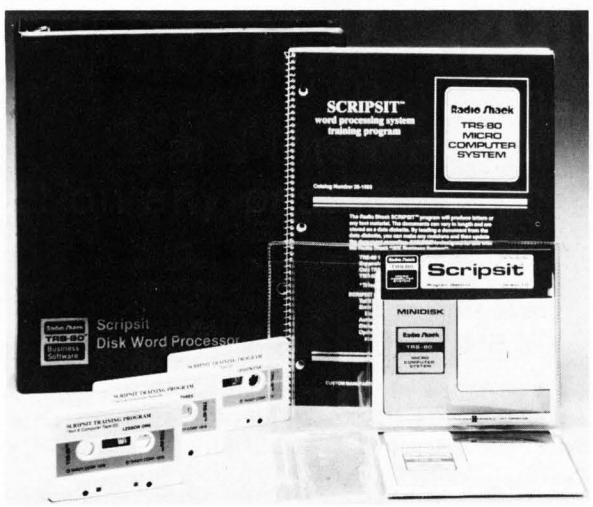
```
1200 ' * GRAPHICS *
1210 CLS:DIME$(6):E$(0)=STRING$(15,191)+CHR$(159)+CHR$(129)+" "+
CHR$(132)+CHR$(179)+CHR$(147)+STRING$(25,191)+" "+CHR$(144)+CHR$
(130)+CHR$(175)+STRING$(14,191)
1220 E$(1)=STRING$(15,191)+CHR$(148)+"  "+CHR$(171)+STRING$(2,19
1)+CHR$(163)+CHR$(171)+STRING$(20,191)+CHR$(179)+CHR$(147)+CHR$(
175)+CHR$(129)+CHR$(133)+CHR$(188)+CHR$(168)+STRING$(14,191)
1230 E$(2)=STRING$(15,191)+CHR$(149)+"  "+CHR$(138)+STRING$(2,14
3)+CHR$(170)+STRING$(6,191)+CHR$(155)+CHR$(171)+STRING$(13,191)+
STRING$(2,143)+CHR$(132)+CHR$(160)+CHR$(144)+CHR$(191)+CHR$(170)
+STRING$(14,191)
1240 E$(3)=STRING$(15,191)+CHR$(151)+STRING$(3,154)+STRING$(2,19
1)+CHR$(170)+STRING$(4,191)+CHR$(188)+CHR$(180)+CHR$(130)+" "+ST
RING$(15,191)+CHR$(159)+CHR$(152)+STRING$(2,136)+CHR$(171)+STRIN
G$(14,191)
```

```
1250 E$(4)=STRING$(15,191)+CHR$(149)+STRING$(4,166)+CHR$(175)+CH
R$(170)+STRING$(3,191)+CHR$(159)+STRING$(2,143)+"    "+CHR$(160)
+"    "+CHR$(130)+CHR$(175)+STRING$(5,191)+CHR$(167)+STRING$(4,1
66)+CHR$(170)+STRING$(14,191)

1260 E$(5)=STRING$(16,191)+" "+CHR$(168)+CHR$(191)+CHR$(180)+" "
+CHR$(138)+STRING$(3,191)+CHR$(189)+CHR$(150)+CHR$(178)+STRING$(
3,130)+CHR$(166)+CHR$(153)+STRING$(3,129)+CHR$(177)+CHR$(169)+CH
R$(170)+STRING$(4,191)+CHR$(129)+CHR$(160)

1270 E$(5)=E$(5)+CHR$(190)+CHR$(191)+" "+CHR$(160)+STRING$(15,19
1)

1280 E$(6)=STRING$(16,191)+CHR$(133)+CHR$(138)+CHR$(143)+STRING$
(2,191)+CHR$(136)+CHR$(130)+CHR$(143)+CHR$(175)+CHR$(191)+CHR$(1
65)+STRING$(2,175)+CHR$(172)+CHR$(160)+CHR$(166)+CHR$(153)+CHR$(
144)+CHR$(156)+STRING$(2,159)+CHR$(154)

1290 E$(6)=E$(6)+STRING$(2,191)+STRING$(2,143)+CHR$(129)+CHR$(18
8)+STRING$(2,191)+CHR$(143)+CHR$(133)+CHR$(138)+STRING$(16,191)

1300 PRINT@0,E$:PRINT@64,STRING$(64,191);" ";G$;G$;G$;G$;G$;G$;G
$;STRING$(64,191):PRINT@256,E$(0);E$(1);E$(2);E$(3);E$(4);E$(5);
E$(6):PRINT@704,STRING$(64,191);" ";G$;G$;G$;G$;G$;G$;G$;STRING$
(64,191);E$

1305 PRINT STRING$(26,183);"  IMHOTEP  ";STRING$(26,183);

1310 FOR ZZ=0TO5000:NEXT:RETURN
```

Lines 1320-1370: It is Jubilee time. Here Pharoah uses the number of mistakes made (ER), the degree of completion (N), the number of storehouses (S), and the number of people (P) to rate the ability of IMHOTEP. If rewarded, IMHOTEP has his mistakes erased from the record, which, by the way, will get the priests off his back.

```
1320 ' * JUBILEE *

1330 CLS:PRINT@0,E$;:PRINT@92,"JUBILEE":PRINT"IT IS TIME FOR PHA
ROAH'S JUBILEE. YOU HAVE USED HALF YOUR TIME."

1340 IF(N=23)OR(N>12)AND(P>300000)AND(S*1000>P)AND(ER<2)THENPRIN
TIM$;", PHAROAH IS PLEASED WITH YOUR PERFORMANCE SO FAR AND BEST
OWS A GREAT HONOR ON YOU. FROM THIS MOMENT YOU ARE KNOWN AS 'GRE
AT LORD IMHOTEP'."

1345 ER=-1:IM$="GREAT LORD IMHOTEP":GOTO 1370

1350 IF(N<8)AND(ER>3)AND(P<300000)AND(S*1000<=P+50)THEN PRINTIM$
;", PHARAOH IS DISPLEASED WITH YOU AND DESIRES FOR YOU TO SUFFER
 THE DISHONOR OF BEARING THE TITLE 'IMHOTEP THE INCOMPETENT'."

1355 ER=ER+1:IM$="IMHOTEP THE INCOMPETENT":GOTO 1370

1360 PRINTIM$;", PHAROAH FEELS YOU HAVE NOT PUT FORTH A GOOD EFF
ORT AND DESIRES TO REMIND YOU OF YOUR RESPONSIBILITIES WITH THE
TITLE 'IMHOTEP-HORUS-WATCHES'."

1365 IM$="IMHOTEP-HORUS-WATCHES"

1370 INPUT"PRESS ENTER TO CONTINUE";A$:RETURN
```


Now you can have a way with words . . .



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EARTHPORT II
continued from page 47

```
ING$(9,191)+CHR$(189)+CHR$(176)+STRING$(20,32)+CHR$(176)+CHR$(18
4)+STRING$(7,191);
11016 PRINT@343,CHR$(184)+STRING$(7,191)+CHR$(180)+STRING$(25,32
)+CHR$(176)+CHR$(188)+CHR$(190)+STRING$(3,191);:PRINT@280,CHR$(1
60)+CHR$(190)+STRING$(4,191)+CHR$(144)+STRING$(28,32)+CHR$(160)+
CHR$(184)+STRING$(2,191);
11017 PRINT@218,CHR$(188)+CHR$(191)+CHR$(180)+STRING$(33,32)+CHR
$(176);:PRINT@155,CHR$(144);
11020 PRINT@612,CHR$(91)+CHR$(26)+STRING$(5,24)+" LANDING "+CHR$
(26)+STRING$(7,24)+" PAD ";
```

Lines 11030-11090: Performs same function as routine at lines 55-100

```
11030 GOSUB1000:X=5:Y=3
11035 O=O-1:IFO<0THEN200
11040 GOSUB1000:GOSUB2000:RESET(X,Y)
11050 X=X+(HS/2)
11060 Y=Y+(VS/2)*-1
11070 IFX<3THENX=3ELSEIFX>124THENX=124
11080 IFY<2THENY=2
11082 IFX>70ANDX<77ANDY>23ANDY<26THENRESET(X,Y):GOSUB12000:GOTO1
1900
11085 IFPOINT(X,Y)THEN6000
11090 SET(X,Y):GOTO11035
```

Lines 11900-11999: Erases view screen.

```
11900 FORA=65TO705STEP64:PRINT@A,STRING$(62,32);:NEXT:PRINT@769,
STRING$(62,176);
11999 RETURN
```

Lines 12000-12001: Displays computer report message using MID$ function.

```
12000 PRINT@867,STRING$(27,32)+CHR$(26)+STRING$(27,24)+STRING$(2
7,32);
12001 M$="                    COMPUTER REPORT:  THE CLOSE-UP S
CANNER REPORTS LANDING PAD IN VIEW, NOW SWITCHING VIEW SCREEN TO
 CLOSE-UP SCANNER.                                ":FORA=1TO(LEN(M
$)-28):PRINT@931,MID$(M$,A,28);:FORB=1TO10:NEXTB,A:RETURN
```

VARIABLES:

0	Amount of oxygen remaining in tanks.
HS	Horizontal Speed (Either – or +).
VS	Verticle Speed (Either – or +).
SL	Rank or Difficulty level.
R$	Where the Rank string is stored.
X-Y	For next variables for graphics.
A	Display variable for use in displaying points.
P-S	Variables used to read data for constructing landing pad dome.

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ESCAPE
continued from page 35

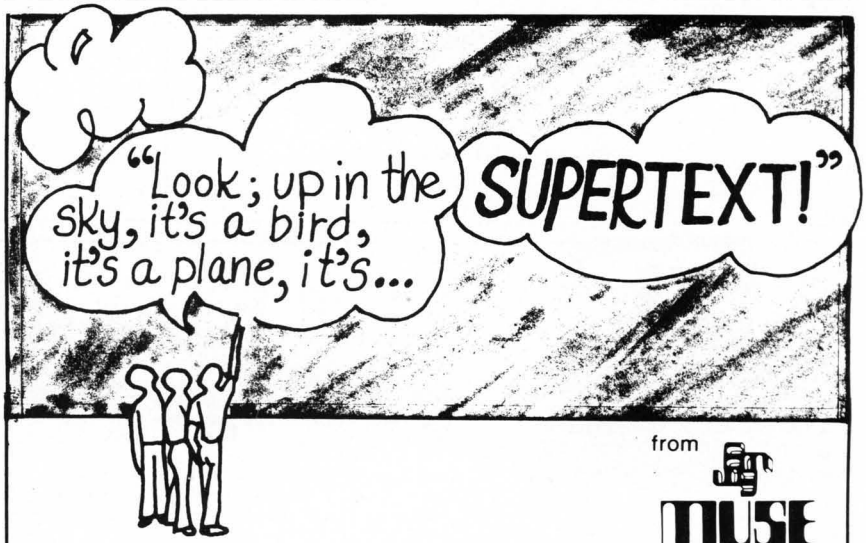
```
:PRINT@407,CHR$(191);STRING$(3,176);:PRINT@471,STRING$(4,191);:P
RINT@535,STRING$(4,191);:PRINT@599,CHR$(191);"   ";
125 RETURN
126 M=0:A$=STRING$(34,191):FORC=206TO782STEP64:PRINT@C,CHR$(170)
A$CHR$(149);:NEXT:RETURN
127 M=1:A$=STRING$(18,188):PRINT@342,CHR$(168)A$CHR$(148);:A$=ST
RING$(18,131):PRINT@662,CHR$(130)A$CHR$(129);:A$=STRING$(18,191)
:FORC=406TO598STEP64:PRINT@C,CHR$(170)A$CHR$(149);:NEXT:RETURN
128 M=2:A$=STRING$(8,176):PRINT@411,CHR$(160)A$CHR$(144);:A$=STR
ING$(8,191):PRINT@475,CHR$(170)A$CHR$(149);:PRINT@539,CHR$(170)A
$CHR$(149);:RETURN
129 M=3:FORX1=60TO67:FORY1=22TO24:SET(X1,Y1):NEXT:NEXT:RETURN
```

Line 130: Error trapping routine (hopefully never used).

```
130 RESUMENEXT
```

Line 131: Draws the picture of the "X" and saves it in L$. (The "X" is really the walls of the maze converging in the distance.)

```
131 FORX1=0TO127:SET(X1,X1*47/127):SET(X1,47-X1*47/127):NEXT:FOR
Z5=0TO15:POKEVARPTR(Z$)+1,(Z5-INT(Z5/4)*4)*64:POKEVARPTR(Z$)+2,6
0+INT(Z5/4):L$(Z5)=Z$:NEXT:L$(15)=LEFT$(L$(15),63):RETURN
```

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PREPACK
continued from page 48

```
390 D$=D$+A$
400 D$=D$+"   "
410 P=2
420 E=1
430 Q$=MID$(D$,P,1)
440 R$=MID$(D$,P-1,1)
450 S$=MID$(D$,P+1,1)
460 IFQ$=A$THENE=-E
470 IFE=-1THEN520
480 IFQ$<>";"ORR$<>")"ANDR$<>A$ANDS$<>A$ORS$=";"THEN520
490 IFMID$(D$,P+1,4)="ELSE"THENP=P+4:GOTO520
500 D$=LEFT$(D$,P-1)+RIGHT$(D$,LEN(D$)-P)
510 P=P-1
520 P=P+1
530 IFP<LEN(D$)-3THEN430
540 D$=LEFT$(D$,LEN(D$)-3)
550 Q=1
560 I=INSTR(Q,D$,"INPUT")
570 IFI=0THENPRINT#2,D$:GOTO280
580 E=1
590 FORX=1TOI-1
600 IFMID$(D$,X,1)=A$THENE=-E
610 NEXT
620 P=I+5
630 IFE=-1THEN680
640 IFMID$(D$,P,1)<>A$THEN680
650 P=P+1
660 IFMID$(D$,P,1)<>A$THEN650
670 D$=LEFT$(D$,P)+";"+RIGHT$(D$,LEN(D$)-P)
680 Q=P
690 GOTO560
```

figure 1

these semicolons can be safely removed

```
10 PRINT X;"PIECES.";: PRINT X ; A(0) ; Y : INPUT"HOW MANY";Z
```

these semicolons must remain where they are

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DATAPOKE
continued from page 49

line 10. Appears in lines 470, 490, 510, 520.

PL Pointer to memory locations within line 10 that are to be changed. Appears in lines 470, 480, 490, 500, 520.

X$ Temporary storage for strings converted from integers. Appears in lines 170, 180, 190, 470, 480, 490, 500, 510, 520.

Y Holds integer to be broken into its least and most significant bytes. Appears in lines 50, 60, 330, 350, 430, 440, 450, 470.

Z Ranges between 5 and 255. Points to position within DATA statement where next character is to be Poked. Appears in lines 150, 190, 200, 210, 320, 330, 350, 400.

Program Breakdown

10 GOTO 20:* will later be overwritten with blanks. The other * s will be replaced by numbers.

30 Checks if the first colon in line 10 (ASCII for colon = 58) is still there. If not, 'BREAK' key has been hit and program has been restarted.

40 EN points to first available memory location for a new program line.

50-60 Store EN and EN+5000 so they won't be lost when BASIC pointers reset. They are stored in locations previously containing 20:* from line 10.

70 Reset end of program pointer to point 5000 locations further up in memory. Makes room for DATA statements. CLEAR50 resets other pointers.

80 Get EN out of storage

90 Poke GOTO20 : into line 10.

100-145 Instructions. Input memory locations to be saved.

150 Subroutine 470 fills in * s in line 10. C counts DATA statements. DN is DATA line number. Subroutine 440 formats a DATA statement.
160-220 Fill in data.

170-200 PEEK at memory location, convert to string, and POKE ASCII code for each digit into a DATA statement.

210 Put comma (ASCII for comma=44) after number in DATA statement unless close to end of statement, in which case fill to end with blanks.

230-310 Instructions.

320 Three zeros is end of program marker.

330-340 Last DATA statement now points to end of program.

350-370 Reset end of program pointer.

380 Blank out GOTO20: in line 10.

400-420 Update DATA statement counter C, DATA line number DN, first location of current DATA statement EN. Subroutine 440 formats DATA statement.

430 Convert integer Y into least significant (LY) and most significant (MY) bytes.

440 Put in pointer to next line. Next line starts 256 locations further up.

450 Put in line number.

460 Put in code number for DATA (136) and end of line mark (0).

470-520 Fill in * s in line 10.

470-480 Prepare memory size data.

490-500 Prepare data for FOR . . . NEXT instruction in line 10.

510 Make string a uniform length.

520 POKE string into position in line 10.

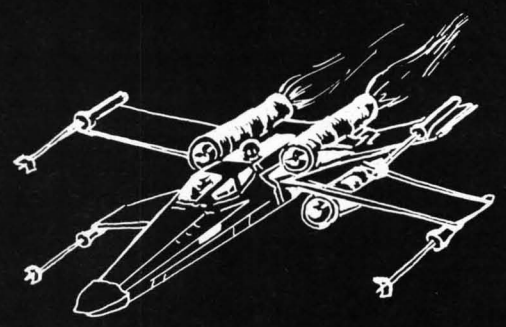
```
10 GOTO20:*POKE16561,***:POKE16562,***:CLEAR50:FORK=*****TO*****
:READN:POKEK,N:NEXT
20 REM W. MASON, BOX 316, HORNITOS, CA, 95325
30 CLS:PRINT"DATAPOKE -- BY W. MASON":PRINT:IFPEEK(17136)<>58THE
NCLS:PRINT"SORRY, NO RERUNS. MUST LOAD PROGRAM AGAIN.":END
40 DEFINTA-Z:EN=PEEK(16633)+PEEK(16634)*256-2
50 Y=EN:GOSUB430:POKE17134,LY:POKE17135,MY
60 Y=EN+5000:GOSUB430:POKE17136,LY:POKE17137,MY
70 POKE16633,PEEK(17136):POKE16634,PEEK(17137):CLEAR50
80 DEFINTA-Z:EN=PEEK(17134)+PEEK(17135)*256
90 POKE17133,141:POKE17134,50:POKE17135,48:POKE17136,32:POKE1713
7,58
```

```
100 PRINT"THIS PROGRAM COPIES THE NUMBERS IN SPECIFIED MEMORY LO
CATIONS
ONTO DATA STATEMENTS BEGINNING ON LINE 20 .
IT ALSO LEAVES IN MEMORY A BASIC PROGRAM WHICH, WHEN RUN, SETS
MEMORY SIZE AND POKES THE DATA BACK INTO MEMORY."
110 PRINT:INPUT"ENTER (IN DECIMAL) SMALLEST MEMORY LOCATION TO B
E SAVED";M:PRINT
120 IFM<=PEEK(16561)+PEEK(16562)*256 PRINT"WARNING: MEMORY SIZE
NOT SET LOW ENOUGH TO PROTECT";M:PRINT
130 PRINT"DO YOU WANT TO SAVE ALL MEMORY FROM";M;"TO 32767";:INP
UTA$
140 IFLEFT$(A$,1)="Y"THENL=32767 ELSEINPUT"ENTER FINAL MEMORY LO
CATION TO BE SAVED";L!:IFL!<=32767THENL=INT(L!) ELSECLS:PRINT"SO
RRY, I CAN'T GO HIGHER THAN 32767. TRY AGAIN?":GOTO110
145 IFL<MTHENCLS:PRINTL"IS LESS THAN";M;". TRY AGAIN?":GOTO110
150 CLS:GOSUB470:N=L-M:C=1:DN=20:Z=5:GOSUB440
160 FORK=0TON
170 X$=STR$(PEEK(M+K)):PRINT@0,"SAVING MEM LOC";M+K
180 FORI=2TOLEN(X$)
190 POKEEN+Z,ASC(MID$(X$,I,1))
200 Z=Z+1:NEXTI:IFZ=255 GOSUB400
210 IFZ>5THENIFZ<252THENPOKEEN+Z,44:Z=Z+1 ELSEFORZ=ZTO254:POKEEN
+Z,32:NEXTZ:GOSUB400
220 NEXTK
230 CLS
240 PRINT"MEMORY LOCATIONS";M;"TO";L;"NOW SAVED ON DATA STATEMEN
TS.":PRINT
250 PRINT"LINE 10 NOW CONTAINS A PROGRAM WHICH WILL SET MEMORY S
IZE
AT";M;", AND THEN POKE THE DATA BACK INTO MEMORY.":PRINT"THE DAT
A IS ON ";:IFDN=20THENPRINT"LINE 20." ELSEPRINT"LINES 20 -";DN;"
."
260 PRINT"EVERYTHING EXCEPT LINE 10 AND THE DATA HAS BEEN DELETE
D."

270 PRINT:PRINT"BEFORE YOU CSAVE THE PROGRAM, YOU MAY WANT TO AD
D
COMMENTS AND INSTRUCTIONS."

280 REM
290 PRINT:PRINT"SUGGESTION: FOR A 'SYSTEM' PROGRAM ADD:":PRINTDN
+10;" PRINT";CHR$(34);"TO START, ENTER 'SYSTEM', THEN /X";CHR$(3
4)
300 PRINT"WHEN ENTERING LINE";DN+10;", ENTER A STARTING ADDRESS
IN PLACE OF X."
310 REM
320 POKEEN+Z-1,0:POKEEN+Z,0:POKEEN+Z+1,0
330 Y=EN+Z:GOSUB430
340 POKEEN,LY:POKEEN+1,MY
350 Y=EN+Z+2:GOSUB430

360 POKE17134,LY:POKE17135,MY
370 POKE16633,PEEK(17134):POKE16634,PEEK(17135)
380 CLEAR:FORI=0TO4:POKE17133+I,32:NEXT
390 DELETE20-520
400 IF K<N THENZ=5:C=C+1:EN=EN+256:DN=DN+10:GOSUB440
410 IFC>20THENCLS:PRINT"DATA SPACE FULL":END
420 RETURN
430 MY=INT(CDBL(Y)/256):LY=Y-MY*256:RETURN
440 Y=EN+256:GOSUB430:POKEEN,LY:POKEEN+1,MY
450 Y=DN:GOSUB430:POKEEN+2,LY:POKEEN+3,MY
460 POKEEN+4,136:POKEEN+255,0:RETURN
470 N=4:Y=M-2:GOSUB430:X$=STR$(LY):PL=17143:GOSUB510
480 X$=STR$(MY):PL=17154:GOSUB510
490 N=6:X$=STR$(M):PL=17165:GOSUB510
500 X$=STR$(L):PL=17171
510 IFLEN(X$)<NTHENX$=STRING$(N-LEN(X$),32)+X$
520 FORI=2TON:POKEPL+I,ASC(MID$(X$,I,1)):NEXT:RETURN
```


X-WING II

by Chris Freund

RAINWARE



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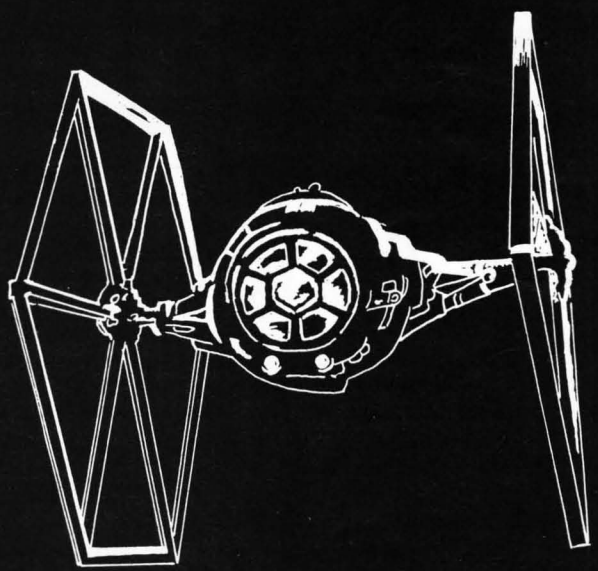

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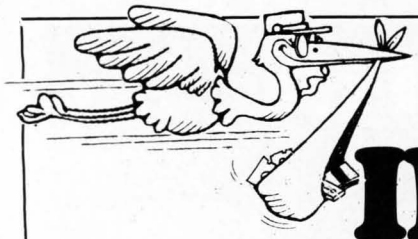

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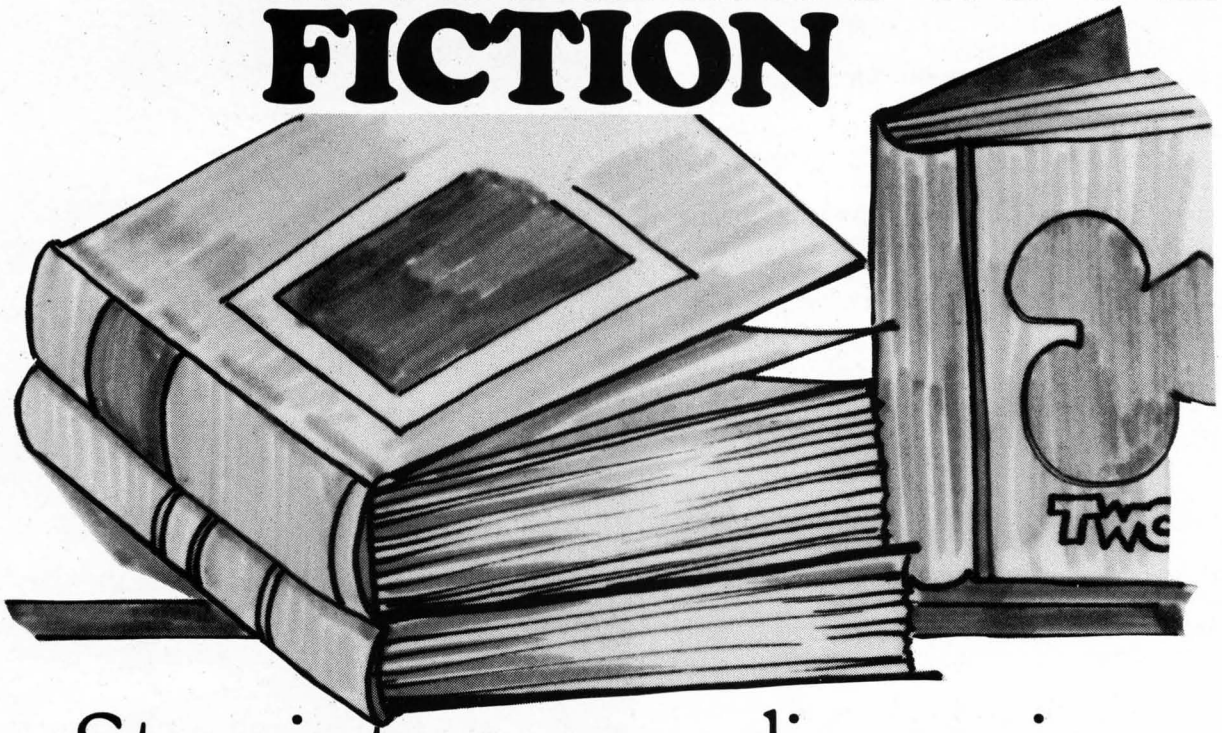

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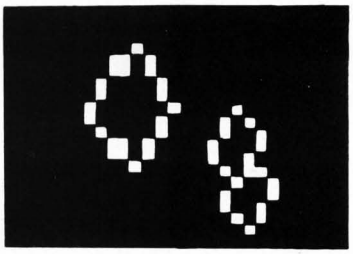

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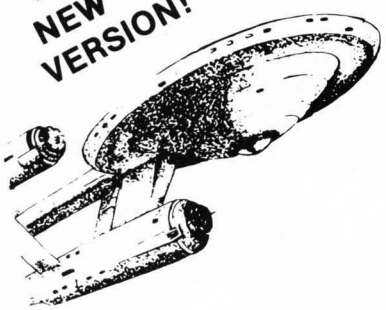

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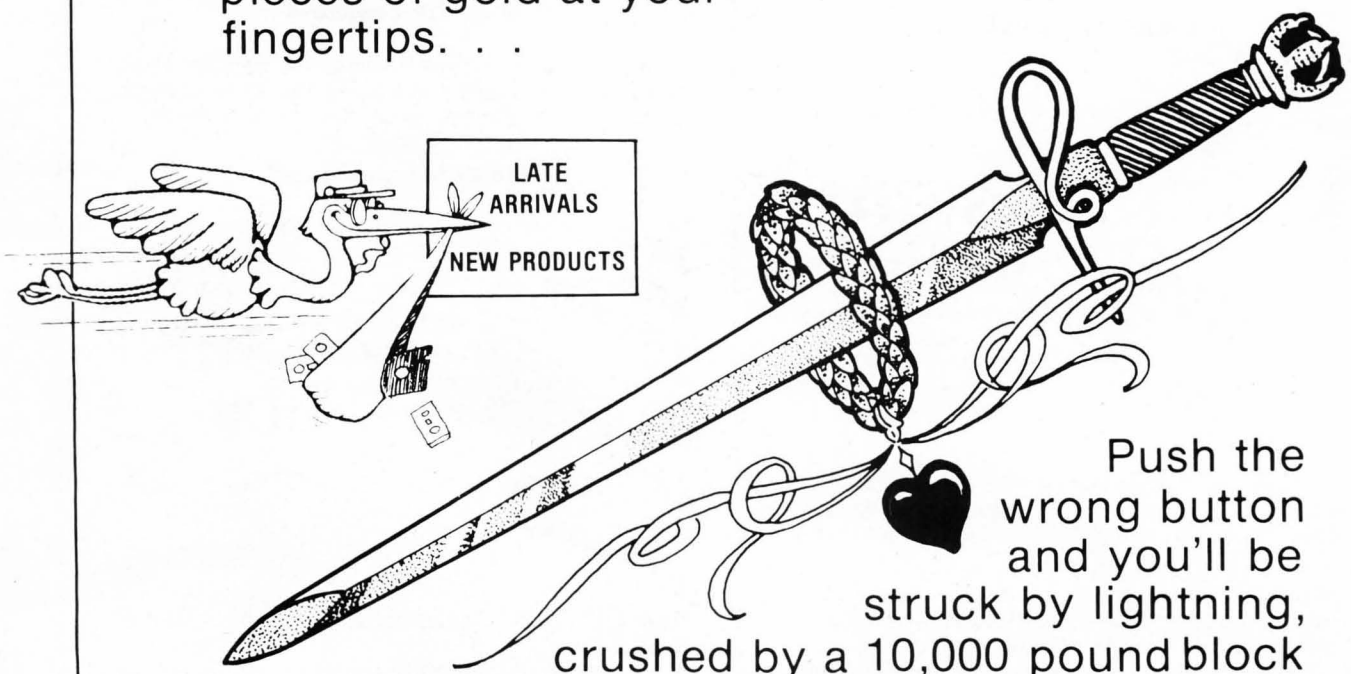

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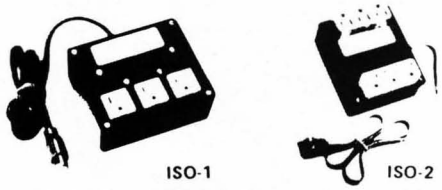

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You may or may not already be familiar with **SoftSide** magazine. If you are, it's likely that you remember it as a digest-size publication that has good software and a lot of programming hints for the TRS-80 or Apple. Well, we've expanded our format. We still offer everything we did before, including our friendly, easy-to-read approach; but now we've also made a firm commitment to fully explaining the how and why of your computer and the programs we publish. Each and every one of our programs is fully documented and explained. We've added regular columns by professional programmers who create microcomputer software to share their tricks and techniques with you. We've added regular how-to columns about such things as computer graphics, adding sound to your programs, and developing your own data base program. We've even added an interesting little feature called "One-Liners," amazing little programs written in only ONE line of code. All this fully supports the TRS-80, Apple, and now the Atari computers. As other home computers reach wide levels of acceptance, we'll support them also.

We hope you'll try **SoftSide**. We think we have a good, interesting, and useful magazine. Whether you're just starting out or already a pro, we hope you'll find something in **SoftSide** you like.

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Mark Pelczarski
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