

SOFTLINE

VOLUME 2

MAY-JUNE 1983

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DIRECTLINE

Opinions, Please

I'm writing a letter concerning the topic of software copy protection. In the last *Softline*, John Woo wrote in saying, "My opinion of copy protection is that it is 50 percent stupid." Now, why is it stupid to try to keep people from copying your programs? I know that all the codes can be broken, but does that make it right? Imagine this: A programmer writes a program and puts it on the market for thirty dollars. If one person buys this program and lets two friends copy it, and then friends of those two friends copy it, pretty soon everyone will have the game but the programmer will have hardly any money. Now if programmers keep getting just a little money, they might stop making programs, and then we'd have no new games or utilities! Well, I hope readers will respond with their opinions. Also, did you know software copying is also called pirating, and it's illegal. You might like to know I'm only eleven. Also, does anybody have a clue how I can get past the lava in *Adventureland*?

John Valenti, Livonia, MI

Woes of Woo

I am not writing to you about software piracy, but I am writing to you about copy protection. To me, they are two totally different things.

Some manufacturers go to such an extent to protect their software that we have to suffer from it. Many copy-protection systems require a hardware modification, and what if the hardware modification breaks down while we are using the product? Obviously, the program will crash and we will have to pay for a new hardware chip. That is the idea I don't like. Why should customers have to pay for something that has no use to them? For example, I know that *Basic* from Delta Micro Systems uses a chip in the I/O socket of the Apple for the protection of the program. Now, if the chip fails to work after a ninety-day warranty period, the program will not work and the customer will have to pay \$25 for a new chip. Many people have written to *Softline* and other magazines about copy protection; why do software manufacturers still have to protect their software? Sure, their most famous line is, "But we have to protect our investment," even though software companies like Penguin Software and Beagle Bros seem to be doing better than ever without the use of copy protection. So my only major question is, "Why must you, even though it messes up the customer's life?"

If there are some software manufacturers who use software protection and have read this far, please take into consideration what I have said in my letter.

John Woo, Bronx, NY

The Price of a Program

I find what I've heard about software prices hard to understand. Does the programmer really get only \$2.70 on a \$30 program? I've been thinking about how software compares with record production. More people are involved in making a record than in producing a disk (agents, studio personnel, songwriters, musicians, producers, promoters, and so forth). Records cost much less than programs do retail. From that I conclude that software is grossly overpriced.

But now consider that records are bought by many more people than software disks, that program authors spend a great deal of time developing their work (they should be paid more), and that it takes much longer to manufacture the disks than it does to press records. From this I would figure not that software is so tremendously overpriced, but that its price must come down. I think everyone in the industry would profit from this price reduction. Dealers don't sell games unless they are very desirable to buyers, and buyers don't

like waiting for mail-order copies to reach them.

I remember when Apple software was only \$11 for a full cassette. Sure, we've come a long way since black-and-white invader games. But even with the low prices, the then-small market, and generally no protection at all, many of those early companies are still around and doing well (Muse, for example).

Given this, I submit that there should be a considerable price drop in software for the Apple, as well as for other computers.

Also, if you wish to see a list of the game files you've entered in the *High Scores Database* program I wrote (March 1983), type s from the main options list, and from Applesoft type the following with no line number:

```
FOR T= 0 TO NU:PRINT T;"  ";GA$(T):NEXT T
```

Then hit return, and remember to use control-S to stop the scrolling of the list.

Another thing: When the program asks, "What game do you wish to work with now," if you press return during this, the program will use the same name you were just working with. (This does not apply when you first load the program, of course.)

Jason Meggs, Bethesda, MD

Lacking Some Awe

I think "the Woz" could stand to remove "awesome" from his "vo-cab."

Why was he dangling little "awesome Woz" from a balcony?

Why does everyone in *Softline* get a "kudo"?

(Do you like the Commodore 64?)

Kevin Fowler, Fairbanks, AK

Why not?

A Kennel of Mutts

Softline's Dog of the Year software contest was, in my eyes, a poll to vote for a computer program that was inexcusable in the gaming world due to the following reasons: overhyping the product by a company that didn't live up to expectations; and de-evolutionizing software by not following basic guidelines necessary for a computer game to survive in the current market, or by a big name in the gaming industry cranking out a less-than-acceptable program. Do you agree?

Fine, perfect, great.

So why were *Snoggle* and *Pulsar II* in the barf-out top ten? Sirius and Broderbund never tried force-feeding the game down our throats in any sudden or unexpected way; the games have been around for years. If you're going to pit senior-citizen games up against virile, young competitors, try running this poll again in 1985. *Cyborg* and *Castle Wolfenstein* will top the list, I guarantee you.

Pulsar II may not have been especially innovative, but it did spend its share of time basking in the Top Thirty sun. And as for *Snoggle*, how could you accuse such a helpless program of as indecent a crime as shoddiness? That game was the pioneer *Pac-Maner*. All maze games (including *Microwave*, *Taxman*, and *Serpentine*) are only following that blazing path that *Snoggle* made through the computer gaming market.

Snoggle, to refresh your memory, was beating *Ultima*, *Wizard and the Princess*, and *Zork* for several months in *Softalk's* Top Thirty, and it spent practically all of the time in the Top Ten of those Top Thirties. Certainly, it wouldn't stand a chance if it had been released now, but that's just it: It wasn't.

I agree and sympathize with those of you who thought *Frogger* and *Human Fly* deserved the Royal Bat Guano awards, being that

they were both such backward steps in the wondrous land of computer games. But how anyone could be as flippant and heartless as to put a once-popular game like *Snoggle* down is beyond me.

Kyle Mathis, Sacramento, CA

Digging for Facts and Treasure

Thanks for publishing Evan Hodson's letter, which led to publishing the addresses of several distributors of the *Eamon* adventures.

When I was reading about the buried-treasure contest winners, I noticed that you didn't (as far as I could tell) award the buried treasure itself. On the cover of the January '83 *Softline* there is an allusion to the effect that the treasure itself will be awarded. In the contest description, it is stated that "... the *Softline* reader who finds the treasure and best estimates its value may keep it."

Who won the treasure itself? It seems to me that someone should have ended up with an adventure or fantasy/role-playing game (such as *Wizardry*).

David Hoh, Wilmington, DE

But in the larger sense, treasure is what you make it, n'est ce pas? With the treasure he made, winner Bruce Warden could have bought Wizardry 4.445 times over.

Maze Mania

Yes, I'm one of those guys who spent hours at the keyboard typing *The Amazing Maze*. When I was finally done, I ran it. The computer printed the title and then told me there was an out-of-data error in line 3020. Could someone please tell me what I did wrong, or is this a bug in the program?

In part 3, should I load the original program and type in all that stuff or is that a whole separate thing? Also, when I'm finished typing in and listing one, do I get out of the Monitor by `3D0C` and then `bsave Bfillplot,A$6000,L$7AF`, or do I just do the `bsave` from the Monitor?

And in part 4, is that program a whole different program than the other one? Are there any more parts to *The Amazing Maze*?
Michael Rosen, Baltimore, MD

You may bsave from the Monitor or Basic. Unless there is a specific instruction to replace or modify a previous listing with a new one, assume that each program is independent.

Just One More

I came across John Mueller's error correction to Ken Rose's column in January, and as I checked the program by running it I realized that there was one more error. If, after getting the magic spring, you get something else (such as the sword on the way back to the castle), the program will display the message of getting the magic spring. (You push and tug the magic metal spring. . . .) Since this is unwanted, I have corrected the problem line; it should read:

```
870 IF OB(30)=34 AND X=3 THEN GOTO 3400
```

Also, let's see more on the TRS-80 in *Softline*. Don't neglect us just because Apple and Atari dominate the market.

Paul Risenhoover, Pacific, MO

Ring and Ring Again

In response to the letter "Bibliophiliac Blitz," which appeared in the March issue of *Softline*, I would like to correct Nils Nieuwejaar. Nieuwejaar stated that the character author of *The Hobbit* was a combined effort of Bilbo, Frodo, and Samwise Gamgee. Actually,

The Hobbit was written by Bilbo with no help from his friends, as originally stated in September's *Directline* by James Brown in his letter "Message from Middle Earth." The story of *The Hobbit*, or *There and Back Again* as Bilbo called it, "was derived from earlier chapters of the *Red Book*, composed by Bilbo himself" (J.R.R. Tolkien, *The Fellowship of the Ring*, page 19).

Also, I would like to correct Ken Rose, who started this whole thing with his article "From Here to There and Back Again" in the May issue of *Softline*. Rose was not only wrong about the author of *There and Back Again*, but he was wrong about the book as well. It is not from J.R.R. Tolkien's *Lord of the Rings* trilogy, but rather the prelude to it, separated by twelve years and some three hundred pages of manuscript. I hope this clarifies any questions as to the author of this delightful tale.

David A. Renberg, Coral Springs, FL

Driving Them Mad in France

I live in France (and I'm French), and there's only one computer store in Paris where I can find *Softline*. I play a lot with my Apple, but some programs are very difficult to find (*Teleport*) or haven't arrived here yet (*Serpent's Star* and *Boa*). Sometimes I receive them when they're no longer hot. I have some hot programs (in France—I don't know if they're still hot in the United States), like *Wavy Navy*, *Evolution*, *Ice Demons*, *A.E.*, *Sherwood Forest*, and *Flip Out*. My favorite programs are *Microwave*, *Aztec*, *Flip Out*, *Miner 2049er*, *Wavy Navy*, *Rocket Command*, *The Snapper*, *Sherwood Forest*, and *Star Thief* (for the moment). For me, the two programs that made me laugh when I saw them were *Tank Command* and *Pill Box*. I think it's hard to do worse, even in Basic.

Softline had some very good articles in January. I particularly liked "Wizards versus Wizards." I tried to beat the scores in five minutes, and I did it: 6,400 for *Microwave* (and some points). I've sent in my best high scores, and I hope some will make it into the list. If so, my friends will become mad! Keep up the good work.

Jean-Michael Decombe, Vaucluse, France

Defending Atari

In response to one dissatisfied fellow reader who didn't like the "hack job" that Atari did on *Defender* and *Pac-Man*: Well, I can't say much about *Pac-Man*; I don't know much about it. But *Defender* in the arcades is on a machine with 26K of programming and designed specifically for gaming. On the Atari, the whole thing had to be squeezed into 16K, so of course there's a little tradeoff between game play and memory.

Also, can anyone confirm rumors that Atari will be coming out with *Donkey Kong*, *Pole Position*, and *Tempest* for its great computers?

Now on to *Zork I*. Though I don't know all the answers to the questions in No Tipping, I know that the boat is under the dam (at its base) and you have to turn the bolt on the control panel with the wrench. To make your way into hades, you must first light the match, then ring the bell (after having lit the candles). The candles will drop. Pick them up and light them again, then read the black book. The only way to kill the thief is with the nasty knife.

Warner Young, Madera, CA

Adventure Alumnus Advises

I'm writing to all those lost adventurers out there. I'm not entering the No Tipping contest, but I would still like to help.

For *Adventureland* people, you'll just have to reset the gate; for Darcy Higden, try looking under the bed for your tour guide. For John Woo, have you ever tried pushing the cabinet in the kitchen?

To Riva Bickel, you'll have to have the chest and say the magic word *Eceelf*. For Stephen Newburg, there are two ways to get past the dragon. The first is to give him the gems, and the second is to throw dust in his face. (The second way isn't as good as the first.)

To Bill Jewett, what's wrong? You'll just have to head in a south-west direction. And Brad Diermann, the door is an exit for an underground passage. In *Time Zone*, Riva Bickel, you'll have to break into his shop when he isn't there.

And now for my favorite subject, *Zork*! For Ted Phelps, there is no easy way to kill the thief, the axe is good only for a weapon. The scepter is good only as a treasure. To Deborah Bickford, sorry, you need to be more specific. And to my beloved friend Riva Bickel (glad you're into *Zork*), you'll have to traverse the area before the earthquake comes. And there is a torch in the scenic vista room.

Finally, I'm running out of good adventures. Can anyone please inform me if you know of any?

Jeff Connor, Hingham, MA

Bothered Beach Boy

In answer to Randy Hayes's question on *Mystery House*, to get back to the house at the beginning of the game, go into the kitchen, get the pitcher, and drop it outside the kitchen door. When moving through the forest, when you come to this you will have reached the house.

Jeff Lutzky, Malibu, CA

The Right Angle

In response to Tom Cartaro's letter: You can't open the grate from above. The answer lies in thoroughly exploring the maze. There you can find what you need to unlock it, and you can get under it. To get past the spirits, reading the black book should give you some clues. Just use some things you find in the temple area in the right order at the entrance to Hades—the spirits will leave.

To George Eliade: The coal mine is used to get to new rooms. Just remember that there are ten possible directions in which to go.

I need help in *Zork II*. I have freed the demon and given him the portrait, bills, necklace, statuette, stamp, zorkmid, crown, ruby, and gold key. He still says he wants one more gift. I have no idea where it is. I also need help figuring out the oddly angled rooms.

Jeff Adams, Sandy, VT

A Wiz at Service

About a month ago I was playing one of my favorite games, *Wizardry*. While playing I noticed that some bugs had developed in the program. I sent my *Wizardry* program disk in to Sir-tech for replacement and within a week I received a new program disk. Many thanks to the people at Sir-tech for their fast and friendly service.

Kris Woods, Athens, OH

Giving a Friend a Break

I have been reading my friend's copies of *Softline* for quite some time, and I have just now gotten around to writing to you nice folks. I have a few things to say, and please feel free to use any portion of the following in Directline.

I share G. C. Munsell's (January '83) enthusiasm for *Taxman* by H.A.L. Labs. It is the best *Pac-Man*-type game written for the Apple II that I have seen so far. So why doesn't Brian Fitzgerald advertise his little treasure more? Was there ever some sort of legal suit against this program? If I had written *Taxman*, I would be advertising and promoting it extensively. I found its sequel, *Super Taxman 2*, to be a bit of a disappointment, however. The cartoons, especially number four, are cute. But the bonus levels are, to say the least, very difficult and require too much agility on behalf of the player to manipulate the keyboard in order to outchase the ghosts. A joystick might help solve this problem, but I haven't bought one as yet.

Fitzgerald's other game, *Sheila*, is a refreshing twist in the arcade-adventure genre. I bought an early publication of it that had an extremely ugly black package. This is a potential deterrent to the

success of marketing any software product. Greenberg and Woodhead of Sir-tech obviously agree with this theory, since they used a far superior packaging with *Knight of Diamonds* than they did with *Wizardry*.

Speaking of *Wizardry*, I have just one question to put forth. Does having a character with the distinguished mark ">," earned from the Proving Grounds of the Mad Overlord, give it any sort of advantage in the *Knight of Diamonds*? (For those of you who don't know what the mark ">" means, I can only say . . . try assassinating Werdnal!)

A shorter and better way to circumvent a break in your Applesoft program through rebooting when reset is pushed would be to use *poke 1012,0*. This is all you need. The routine provided by M. Cal (January '83) does work, but it is unnecessarily long. Try mine. If you should wish to disengage this mechanism, just use *poke 1012,56*. Simple.

Here are a few of the other ways I know of to prevent a break in your Applesoft program: Try using *poke 214,255*. If either a reset or a control-C is used to break out of a run, it will seem as if your program is indeed vulnerable to inspection, alteration, or even more unmentionable things! But take heart; if anything besides a run, brun, exec, or catalog is entered after the prompt, your program will be run again. To disengage during your program, use *poke 214,0*.

You can prevent your catalog from being viewed by using *poke 44033,10*. Memory location 44033 is normally set to 17 to read the catalog, which is stored in that track. Thus, using *poke 44033,17* will allow the catalog to be viewed once more.

A fun way to prevent a list after a break or the finish of your program is to use *poke 2049,0*. This will cause the first line of your program to be repeated indefinitely until stopped. I like to add line 0:REM NO LISTING ALLOWED!

If you want to prevent a break from a control-C, try using *0 onerr goto 10000* and *10000 resume*. That takes care of that! (Note: Be sure that your program is absolutely debugged before trying this one.)

Yes, G. Eliade (January '83), most software sold today is unnecessarily expensive. But that doesn't justify pirating. Can you honestly say that if one of the arcade games you have pirated had been priced 50 percent less that you would then have bought it? I think not. I also agree with you in commending Penguin Software president Mark Pelczarski for packaging his Apple II graphics software unprotected. Way to go!

Softline is tops with me! Personally, G. Fergus (January '83), I do not think that \$12 a year for a subscription to this magazine is too much to ask. *Softline* is the only magazine around that enhances my application of my Apple II computer in one of its most important functions—game playing.

Alan Swanson, Brooklyn Center, MN

The Truest Art

I would like to register a complaint with your editorial staff.

It concerns the lack of gravity with which you treat your subject, computer games. It is the same kind of light, childish tone that I also find so inappropriate in the writings of game art dilettante Antoine de St. Cyr-Creully.

Computer games as a form of art is serious business. I, the proud owner of such early works as *Shinjenko Itanabe Kudasai* (second century Japanese for *Tsunami*), *Gathering Stones in Outer Reaches of Ogdensburg* (later named simply *Star Maze*), and *Rich Snobs in Recreational Delight* (eventually sold to some company and marketed under the nom de joue, *Micro Pro Golf*), find such frivolity in the discussion of my second favorite pastime an outrage!

My suggestion to M. Creully would be to actually experience some of these masterworks on a rainy Sunday afternoon with a glass of Christian Brothers' Johannesberg Gray Riesling and Haydn's Allegretto on the turntable. Then, maybe he might be able to appreciate the full aesthetic wonder of electronic creation.

Kris Daye Leigh, Stanley, Falkland Is. ■

NO CONTEST



No, it certainly isn't. There's practically nothing but contests this time around; the whole magazine is crawling with them. If you want them, you'll just have to go looking for them. No Contest is pretty put out by the whole thing, if you want to know the truth, and it's going to sit here and sulk while you do. The *Pensate* contest is the biggie this time around; then there's the strategy game naming; and then there's the arty game titles; and of course the tips and the high scores. . . . There's just no end to cheap-jack competition once somebody sees you've got a good thing going. Okay; right; fine. That's no problem for No Contest. No Contest has two heavy-hitters right here. You want art? How about:

Songs of the Softline. Have you ever sat down for a bracing round of adventure/arcade/fantasy/strategy game playing and then realized an hour or two later that some little ditty is playing in your head and it won't go away? Can you spot a visual pun where the programmer may have intended none? Do neat rhyming juxtapositions readily suggest themselves to you? Do you find yourself whistling or humming excessively and tapping your foot during play?

You probably weren't even aware that you were displaying these symptoms, so deeply rooted are they in the gaming subconscious. As a public service, *Softline* is conducting a psychiatric study to determine the causative factors behind this disturbing, aberrant, and probably fatal behavior. Yes, we're here to help. But you have to want to be cured. Do you trust us? Good.

Here is what you must do: The next time you're playing a game, think up a song to go with it (see *Pac-Man Fever*, ASCAP). A familiar melody will probably occur to you first. Find your own words to fit into it. Get a piece of paper, jot down a chorus and at least one verse, tell us what to sing it to the tune of, and write your name and address at the top, plus the name of your computer and two games you'd like to play but don't have. Then put it in an envelope and

mail it to: Softline Songfest
Box 60
North Hollywood, CA 91603

You must do this before June 15, 1983. The results of the study will be published in the July number of this journal, along with the most . . . interesting . . . examples received. Your lyrics should sparkle, your wit should shine, and your lines should scan. Make it sing. A clinical honorarium of \$50 and two computer games will be dispensed to the individual whose work gives evidence of the least chance of being cured.

Softline B.S., Part II. If you've already skipped ahead and looked at the Winners' Circle in this issue, you already know that it was a four-way tie for first place in March's Brent Shaw contest. But in the final analysis, nobody was able to spot all the Brent Shaws; even the "winners" missed a few.

"Well, hell's bells," you're thinking. "The rules said that whoever tallied the *correct* number would win. It was an all-or-nothing thing!"

Just in case you feel cheated, here's a second chance to win. Even if you missed March's contest, you can still enter this one. As you remember from last time, the prize for winning the *Softline* B.S. contest was an expense-paid holiday in Bermuda shorts and a copy of Riverbank Software's *International Gran Prix*.

This month's contest, "Brent Shaw's Bermuda Shorts" (B.S.B.S.), is really simple. Just send us a picture of yourself wearing a pair of Bermuda shorts. That's it! You can photograph yourself sitting around, doing cartwheels, flogging Jason Meggs over the head with his wonderful high-scores-database disk, or anything you want. Anything. Just as long as you're wearing a pair of Bermuda shorts. If you don't own a pair, make some!

The winner of this contest will receive a choice between a year's

**WE STICK OUR G
THE SUN D**



GRAPHICS WHERE ON'T SHINE.

You'll never see Infocom's graphics on any computer screen. Because there's never been a computer built by man that could handle the images we produce. And, there never will be.

We draw our graphics from the limitless imagery of your imagination—a technology so powerful, it makes any picture that's ever come out of a screen look like graffiti by comparison.

And nobody knows how to unleash your imagination like Infocom.

Through our prose, your imagination makes you part of our stories, in control of what you do and where you go—yet unable to predict or control the course of events.

You're confronted with situations and logical puzzles the like of which you won't find elsewhere. And you're immersed in rich environments alive with personalities as real as any you'll meet in the flesh—yet all the more vivid because they're perceived directly by your mind's eye, not through your external senses. The method to this magic? We've found the way to plug our prose right into your psyche, and catapult you into a whole new dimension.

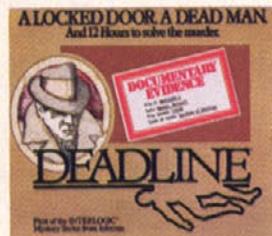
Take some tough critics' words about our words. **SOFTALK**, for example, called **ZORK® III**'s prose

“far more graphic than any depiction yet achieved by an adventure with graphics.” And the **NEW YORK TIMES** saw fit to print that our **DEADLINE™** is “an amazing feat of programming.” Even a

journal as video-oriented as **ELECTRONIC GAMES** found Infocom prose to be such an eye-opener they named one of our games their Best Adventure of 1983.

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supply of Bermuda shorts or the cash-value equivalent (\$106.52) in games for your favorite computer. Runners-up will get \$4.36, or an unmatched pair of Bermuda shorts.

This is also your chance to beat those four guys who "won" the first B.S. contest. You see, as part of their prizes, we sent each of them a pair of outrageous Bermuda shorts and asked them to send us pictures of themselves wearing them. If your picture is better than theirs, then you'll win an additional \$20 for each of the previous winners you beat. And, if money's what you're after, see rule number 4 for more.

Money, money, money. Yum.

Rules. There are no rules, just a few guidelines.

1. Photographs must be full-figure shots from head to toe. No close-ups of knobby knees, bellies, buns, or naughty bits allowed.

2. Be sure to write your name, address, and phone number on the back of the photograph so we can contact you if you win.

3. Entries will be judged solely on craziness, outrageousness, and originality. If you can tie it in visually to one of your favorite computer games, you'll win an additional \$20. Let yourself go wild. (You in front of a computer isn't a tie-in.)

4. *Softline's* B.S.B.S. staff will select finalists, whose pictures will appear in the July *Softline*. Then readers can vote for the winners. Or loser.

5. Photographs may be Polaroids, snapshots, slides, or whatever. They can be photographed by a friend or relative, or by a professional. It makes no diff. No blurs, though.

That's all for the rules. So get out there with your favorite pair and send your picture to *Softline* Short Films, Box 60, North Hollywood, CA 91603. All entries must be postmarked by June 15, 1983. Any deviation from the contest's guidelines will mean you lose.

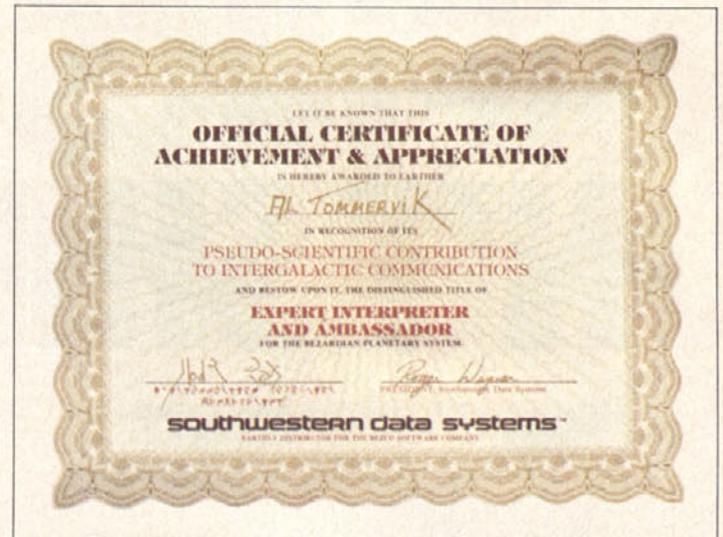
APX Winners. The Atari Program Exchange has announced the winners of the quarterly awards for best user-written home computer programs. APX picked through 230 entries over a three-month period to select winning programs, which will be marketed by Atari retailers and through the APX catalog. The eight winners were awarded more than \$14,000 in Atari equipment for designing programs in the areas of education, utilities, home management, and home entertainment, and will receive royalties on program sales.

In our favorite category, second prize went to Hawaiian hobbyist Scott Ludwig for *Caterpiggle*, a maze with snakes, frogs, and serpent security guards. Mark Reid, 1981 winner for *Downhill*, took top honors for *Getaway*, featuring cops, robbers, loot, and thirty-five vertically scrolling screens.

Arcade Machine Update. The first month's worth of entries are in, and the first winner in Broderbund's *Arcade Machine* contest, based on the most creative use of Broderbund's game-program-writing program, is Albert Lesiak, a fireman from Park Ridge, Illinois. He gets \$200 worth of software and hardware for his winning entry, *Beachhead*, in which a tank, center-screen, must cope with enemy planes, ships, tanks, and snipers. His game will now compete with subsequent monthly winners for the grand prize of \$1,500 worth of hardware and software or the runner-up prize of \$500 worth, to be awarded in July. The contest closes to new entries June 30. See the January 1983 No Contest for details.

All Talking, All Singing. The Alien Group reports it has gotten some pretty keen entries in its talking-and-singing-game contest and has extended the entry deadline to June 15. Entries can be programs of any type, using the Voice Box I or II, Apple or Atari, for generation of music or speech. First prize is \$5,000 and a share in royalties on sales of your winning program by The Alien Group; second prize is \$1,000 and royalties; third through fifth prizes are \$500 and royalties. Judging is done by random groups of young people who just boot up the game and see "how it grabs them." In other words, incorporating the Voice Box routines is a requirement for entry, but first make sure that it's a dynamite program, savvy? Then send it to The Alien Group, 27 West 23rd Street, New York, NY 10010.

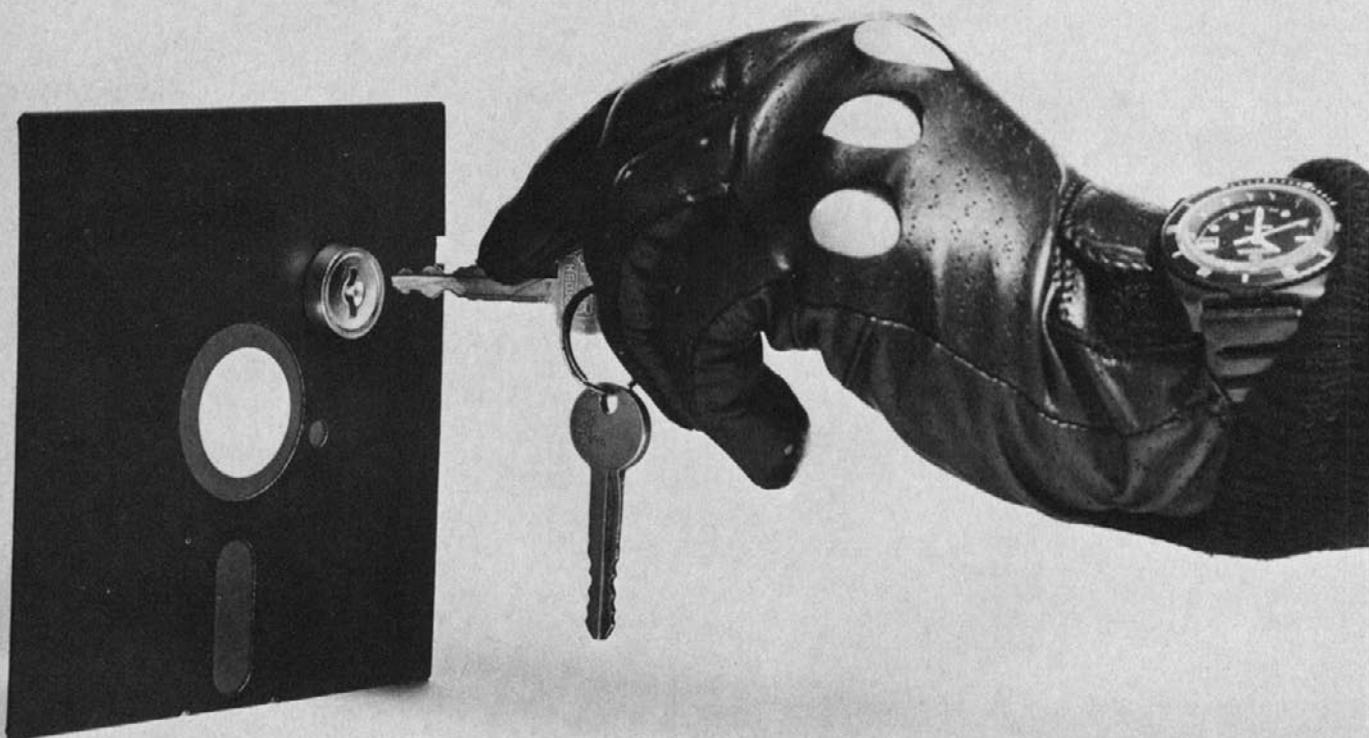
Speaking of aliens, this is an example of what the first cryptic solvers of the SDS game $\rightarrow\theta\gamma\delta\leq\theta$ have been receiving:



Yes, It Was All Leading Up to \$100! Ah, May is in the air, school is almost over, the IRS is happy, and most of us are saving up to splurge on games to keep us busy indoors when it gets too hot outside. John D. Broas (Reedsburg, WI) is one lucky stiff who won't



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have to save up too much. Broas is the winner of the *Softline* Spring Computers contest we ran in March. He'll get \$100 in cold cash from us, which he can use to purchase a low-end new computer, like a TI 99/Z or a VZ 200, and not blow it on something stupid like rent, food, or clothing.

Piles and piles of entries rolled in the door, and a considerable number of you correctly identified all the new spring computers racing for recognition. The only way to select a winner fairly was to have a drawing. So we flew up to San Francisco to visit our good friends at *Antic* and asked them to pick a winner. When we were greeted by a bombardment of baloney sandwiches and Sara Lee pies, we knew we weren't welcome.

We regrouped, pulled some guy from Milpitas off the street, and made him pick one for us.

The eight new computers were: (1) Atari 1200 XL; (2) Texas Instruments 99/2; (3) Timex Sinclair 2000; (4) SV-318; (5) Kaypro II; (6) VZ200; (7) Jupiter ACE; (8) Odyssey Command Center.

Oh yeah, number 9. That's the one that's already in the water, making its splash in the market, and that also had its smiling keyboard plastered all over the issue. So, while we're dishing out the kudos, let's slap some on Mark Ferneau (Potomac, MD), who was selected at random from all those who identified the Apple IIe as the one first off the starting block. For having insight into the market (and for having the brains to climb downstairs to the lower viewing deck and peek through the underwater window), Ferneau gets the \$50 bonus prize in this contest.

Only in a Brent Shaw Contest. When *Softline* readers found out about March's Brent Shaw contest, they went bonkers. Heard in most households was, "Forget Niagara Falls, dear. We've got to stay home and count Brent Shaw references."

Okay, maybe not. But all true Americans were prompted to observe Brent Shaw Month by entering the contest. To wit:

Brentline

Finally! A Brent Shaw contest! The Midwest chapter of the Brent Shaw Fan Club is happy to see that Brent Shaw finally gets the recognition Brent Shaw deserves.

In honor of Brent Shaw Month, the Brent Shaw Fan Club is planning many various activities.

Among them are the sale of Brent Shaw calendars and commemorative pencils to raise money for the Brent Shaw Museum and Wildlife Park.

Anyway, congratulations to Brent Shaw for his entrance into the Brent Shaw Hall of Fame.

—Randy Jones, Lenexa, KS

In celebrating Brent Shaw Month, I have written this original poem:

Brent Shaw, what a guy.
Just look at his high score and you'll know why.

Thanks to his call,

Softline has a contest for all.

Okay, so I'm not Robby Burns, but it was a good try.

—Laird M. Malamed, Los Angeles, CA

I tallied up twenty-four Brent Shaws and hope I never find any again (except when you announce the winner of this contest)!

—David "Fed Up with B.S." Munier, Scottsdale, AZ

Because this contest seems nearly identical to the turkey-counting contest in *Softtalk* last November, are you implying that Brent Shaw is a turkey?

My wife and I just had our first child (Natalie Sara) in the middle of February. Do you think we have nothing better to do than sit around counting Brent Shaws hidden throughout your fine magazine?

—Tom Schai, Roseville, MN

I got *Softline* on March 30. Is Brent Shaw Month in March, April, or both? By the way, who voted for "Shaw, Brent" in the Atari Most Popular Program poll?

—Hopeful Rex Chen, East Hanover, NJ

Answer to both: Does it really matter?

And Now, the Winners:

Nobody.

There are, however, four runners-up. None of them managed to catch all the Brent Shaws. Twenty-nine was the correct count, and Robert Gillis (Birmingham, AL), Scott Stewart (Fremont, CA), and Ethan Starr (Amherst, MA) all submitted tallies of twenty-nine.

So why didn't they win? Because their entries included variations of "Shaw" that didn't count, meaning that they missed some that did count. For those who are still curious, we've included a list of all Brent Shaws (see listing 0).

You should have known (following the syntax rules of Basic) that "Brent Shaw" counted as one reference, not two. Also, "Shaw," as in "Shawn Smith" (page 25; Typifieds *Adventure* entry), was not counted, since the string variable "Shawn" isn't the same as "Shaw" (BS\$ = "Shaw"; SS\$ = "Shawn"; BS\$ <> SS\$). Following the same logic, there were no points given for "Clifford Ramshaw" (page 51; left-hand column, eighteenth line from bottom).

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Whereas Gillis, Stewart, and Starr each missed one, Larry Hedrick (Newport, AR) found one extra. Oh, well.

Just so no semideserving souls go away empty-handed in this magazine, we're sending each of the four near-winners a pair of Bermuda shorts and a copy of Riverbank Software's *International Gran Prix*, or the Atari equivalent, so they can try to beat Shaw's score. Each of the winners will also receive the home version of the Brent Shaw contest to enjoy with the rest of their families. Batteries not included.

Receiving special consideration (three gasps and "Gosh, how nice!") for sending in famous quotations from the works of George Bernard Shaw were Linda Bushyager (Prospect Park, PA), Chris Kimmell (Saratoga, CA), Geoffrey "No Return Address" Laff, Gary Penacho (Tallmadge, OH), Scott Schrader (Fargo, ND), Jim Smith (Portland, OR), Greg Snover (Memphis, TN), and Baldwin Wu (Sunnyvale, CA). Thanks, gang. Real erudite.

Linda Bushyager also gets another whole paragraph to herself, since she was the only B.S. counter able to dig up a photo

Page 10: Title for page: "Congratulations, Brent!"

Page 11: First column, first paragraph, third line; "listing only Brent Shaw's."

Page 14: Second column, fourth line; "Brent Shaw may have some spares."

Page 18: Second column, sixth line from bottom; "Brent Shaw trying to run speed laps in a Buick."

Page 32: Second column, fourteenth line; "Brent Shaw says. . ."

Page 43: Inside gray box, second column, second paragraph, seventh line; "Brent Shaw, however, is nowhere in evidence."

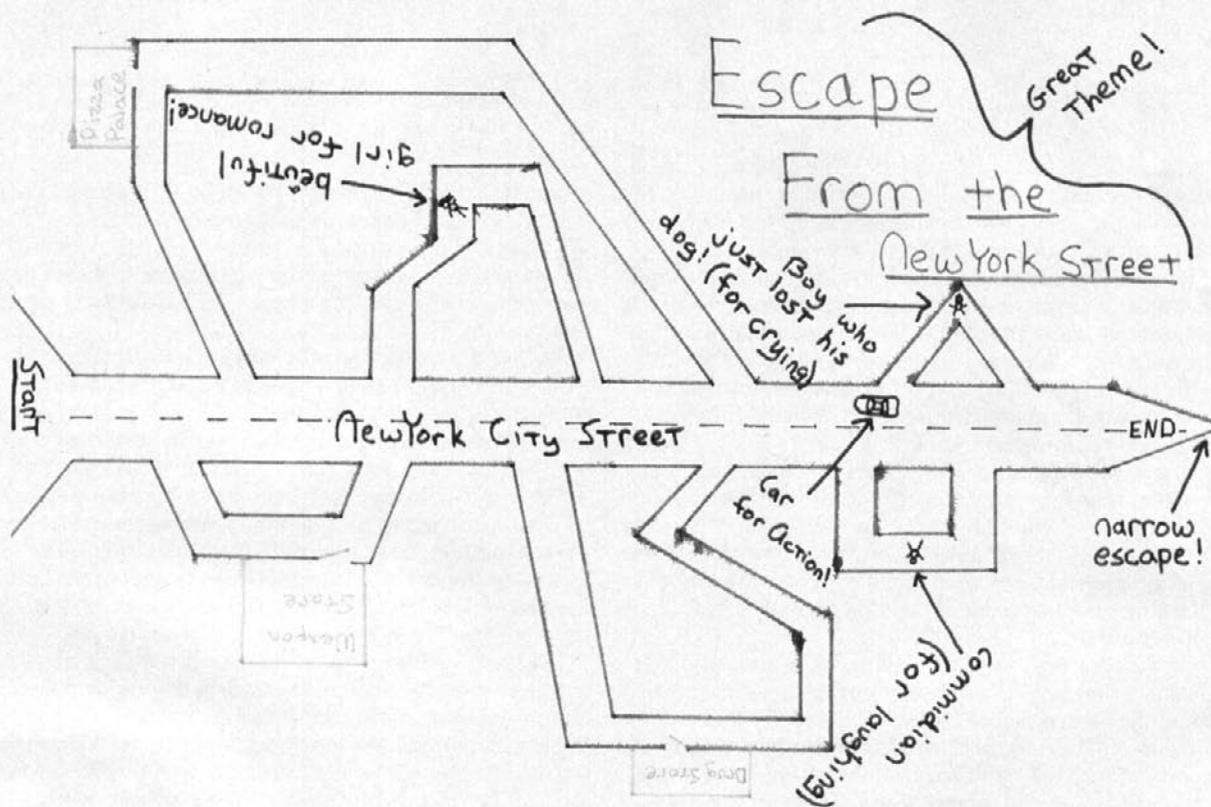
Page 45: Gray box of first-place vote getters; "Shaw," "Brent." This counted as two occurrences.

Page 57: High score for *Crossfire* (Atari). "John A. Shaw."

Total number of references: twenty-nine.

Mazes Are Called; a Few Are Chosen. The winners of March's Maze-Out are in.

For Best Theme (\$50), we couldn't resist Allan Padgett's *Escape from the New York Street*, which speaks for itself herein. Allan is al-



The winner in the Best Theme category of the Maze-Out.

of matinee idol George Brent.

Since everyone else tied for last place, we're holding a tie-breaker to settle all this B.S. B.S. And it's not limited only to those who entered the original contest. This time, anyone can enter. See the No Contest page for details.

Listing 0. Brent Shaw: The Official Count.

Page 1: (Photo) "I Brake for Brent Shaw" bumper sticker; Infomania—"Thanks to Brent Shaw. . ."

Page 3: First column, response to "No Witnesses" letter; "Try giving Brent Shaw a call."

Page 7: All in second column: Our Man Brent; call from Brent Shaw; that Shaw held the record; Brent opined; Well, Shaw's dream; "Brent Shaw Month"; all in honor of Brent Shaw; based on Shaw himself; How many references to Brent Shaw; "Brent,"; "Shaw,"; "Brent Shaw"; total number of Brent Shaw references; *Softline* Random B.S. (Brent Shaw) Generator; count up the number of Brent Shaw references; George Bernard Shaw; George Brent.

so hands-down the best follower of directions. Very imaginative, Allan, but complexity ain't your thing . . . it took our contestmeister only twenty minutes to solve.

In the Most Complex category (\$50), it was clearly the *D&D* stylings of Mac Todd and *The Quest of Mim*. This had random monster encounters up to level 4B, magic items, single event encounters, random treasure items—the whole enchilada. Also a story and four mazes.

And for Best Overall (\$100) and worst follower of directions, it was Len Marinaccio and *Death's Dungeon*. Len took advantage of the "Amazing 3-D Maze" programs that have been running in this very magazine for the last five issues and put his entry on an Apple disk. The result was a multilevel 3-D maze adventure with two-word parser, lots of trap doors, torches, crossbows, terrible puns, a girl, a dragon, and you. It's an outstanding piece of programming. Any adventure game houses out there would do well to remember Mr. Marinaccio's name. Oh, yeah! We had fun playing it, too. **SL**

New Players:



The Ultrasoft "cast of thousands." Back row, left to right: Larry Franks, Linda Perine, Christopher Anson, Alan Clark, Sandy Reetz. Front row: Margaret Anson, Michael Ormsby.

The kinds of innovations that go into bestselling programs do not occur in isolation. The ideas behind Ultrasoft are many and varied and come from a group of talented individuals.

Ultrasoft is one of the pioneers in the latest generation of Apple graphic adventures. It began as the software production and distribution department of Sigma Distributing, a computer hardware distributor in the Pacific Northwest, and was the creation of Larry Franks, a Sigma vice president. He hired Christopher Anson, a software analyst at Boeing Computer Corporation, to head the department, and Anson hired programmer Alan Clark.

The moment of conception for Ultrasoft can be traced to an observation by Clark that most adventures, and most entertainment software in general, were written by hand. He had an idea that, with the tool-using approach that Anson had brought from Boeing, he could write better adventures more efficiently. He wrote a kernel in Basic to demonstrate the feasibility of building a set of tools to generate and run adventures.

Working on the idea nights and weekends, Clark and Anson developed a machine language interpreter from the seed of the Aplesoft program. By December of 1981, they decided that the idea was workable enough to be worth the risk of Anson's leaving Sigma and working on Ultrasoft full-time. Larry Franks left Sigma to join Ultrasoft as vice president and general manager in late spring of 1982, and the new company was officially incorporated in September.

From a Tiny Acorn. Where did that Basic progenitor of the Ultrasoft line lead? Well, at first, it led to *Mask of the Sun*. There's a modular system behind *Mask* and the newer adventure *Serpent's Star* that saves Anson and company from constantly having to start from scratch. As Franks puts it, "We ended up writing a language that we've cleverly named after ourselves. We have the Ultracompiler, which generates Ultracode, which also has another option that generates the graphics known as Ultravision." Holy prefixes, Ultraman!

The key concept at Ultrasoft is structure. The use of software tools is a structured approach to programming. Look at it this way: You can write a routine to do a task, and when a similar task comes up you can write a similar routine. Or you can define the task in all its various permutations in the first place and then use the same routine with different parameters whenever you have to perform that task. This, in essence, is what Ultrasoft has done.

Anson and Clark felt that they could improve on the existing state of adventures in three areas: parsing, graphics, and game play. With adventures, good game play means a good story, and the structured approach applies to that goal as well as to the other two.

Anson says that the company has defined 115 distinct tasks involved in putting out an adventure, and many of those tasks involve creating and refining a story. Everything is planned; frequent meetings are integral to every step of the production. Ideas for the plot of the game, the characters, the puzzles—all are tossed around at these bull sessions.

When a plot succeeds in intriguing the group, the program is written in English pseudocode, a language that won't run on most computers just yet. It's the plot and essential logic of the game set down on paper in a form that can be play-tested without a computer. Most of the logical flaws in a game are thus discovered and weeded out before it ever becomes a runnable program.

When applied to programming, taking the structured approach means that the functional portions of the interpreter are modular. There are distinct interfaces between modules, so if one section of the program needs to be changed, the effects that the change will have on the whole will be known beforehand.

Ultrasoft's parser is based on concepts of artificial intelligence. In any given message, it eliminates words that don't make sense and attempts to make sense out of words that are relevant to the situation. This method frees the player from the verb-noun format of the typical adventure's input. Consider: If you're in a room with two men, one old and one young, in an adventure with a two-word parser, you might have to make several tries before finding the correct verb-and-noun combination that expresses your wish (as to what is correct, the arbitrary decision of the programmer is final).

In *Serpent's Star*, there is just such a situation. But with the Ultrasoft parser, you can type, "Go sit with the old man at the table," and the parser extracts the operative words "sit" and "old man" and sits you down next to him. Once you're familiar with what the operative words are, you can just type "old man" and know the parser will understand. Many of the verbal "puzzles" of the two-word parsers are really only hindrances to realistic game play. After all, you can only put up for so long with messages like "I don't know how to OLD something."

Seeing Is Believing. When the graphics system for *Mask of the Sun* was designed, the Ultrasoft people again zeroed in on the area where the existing software technology fell short. Many graphic adventures require quite a lot of what, in the theater, is called the willing suspension of disbelief. In moving from one place to another, they erase the picture of the first location and draw a picture of the next. In real life it doesn't happen that way. Ultrasoft's graphics are less like comic books and more like movies in the way they pan

from one location to another.

This is what the term Ultravision refers to. There's no way to eliminate the suspension-of-disbelief element from any work of fiction in any medium, but by taking the cinematic approach to graphics, Ultrasoft hoped to make suspension easier. Toward this end Ultrasoft continues to work on generating more sophisticated ways to do things like fading from one screen to another.

Once again, the graphics design in the game shows a careful application of a team strategy. Margaret Anson directs a group of other commercial artists who create the graphics for the whole adventure on paper. The entire thing is storyboarded much like a motion picture. The approved pictures are drawn on a graphics tablet, colored, and touched up with in-house software tools.

In the production of the graphics effects for their adventures, Ultrasoft's use of tools has paid off. Each hi-res picture the program creates appears on the screen in less than half a second. The average picture is stored on disk in less than one-eighth of its final 8K memory size. Because of that memory savings, Ultrasoft was able to use the second hi-res display, which most programmers forsake in order to use the space for code or data, to get the movielike movement effect that has become its hallmark.

The company put as much thought into the text portion of its displays as it put into the other elements of the visual presentation. Instead of the Apple's ROM-generated upper-case text, Ultrasoft has created upper and lower-case hi-res text for all its messages and descriptions. With an even subtler attention to detail, the lines have been spaced a little farther apart than the normal text display for better readability.

Franks got a kick out of a reviewer's reference to Ultrasoft's "cast of thousands."

"We do have a number of interlocking teams that generate these products, and we want to give credit where credit is due," he says. "When a single author in a software firm is credited with a product, I really suspect that a lot of essential support is being ignored." There were five authors listed for *Mask of the Sun* and seven for *Serpent's Star*. "We'll be sticking to that. The names will change some, as the original core management has gotten out of the production end and into just the tool-designing and business management end."

To introduce the rest of the "cast": Margaret Anson, a graduate of the Burnley School of Fine Arts and Chris Anson's wife, is the art director. Sandy Reetz, a friend of Margaret Anson and a fellow alumna of Burnley, does the cover art, and, starting with *Serpent's Star*, some of the game graphics. Michael Ormsby, a friend of Clark's from childhood, came aboard as a game designer and programmer. Anson says that Ormsby and Clark are both game addicts and experts; they've been designing noncomputer games together for years. Finally, Linda Perine was recently hired as an administrative assistant to take over some of Franks's duties.

Ultraplans. In keeping with the structured approach, the folks at Ultrasoft have their future well in hand. Part of the advantage to creating their own interpreter is that they can move it to other computers with major modifications only to the graphics interface. After the interpreter is transported, the Ultracode that the games are written in will work on the new machine without modification. They're targeting the Atari 800, Commodore 64, and IBM pc for future releases of *Mask of the Sun* and *Serpent's Star*.

Their other plans include two new games, one of which they expect to have ready by the end of 1983. The first in a projected series of fantasy role-playing games, it will be called *Shadow Keep*. It will have the same high-quality graphics as the Ultrasoft adventures—in fact, Anson claims, higher quality. The parser will understand the typical one-character commands of the role-playing-type game for such things as movement and combat and will still be able to parse sentences like those in their adventures for puzzles.

The next additions to Ultrasoft's product line will reflect a unique evolution from what they have now. We can't really say more without spoiling the fun of discovering a truly innovative new product. Besides, it's a secret. In other words, Ultrafans, stay tuned: same Ultratime, same Ultrachannel.

SL

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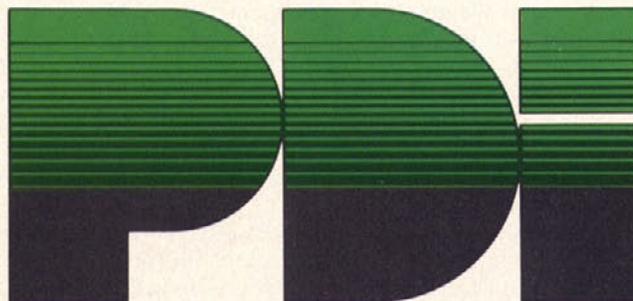
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THE AMAZING MAZE IN 3-D

by Brian Fitzgerald

The end was in sight. He trudged wearily up the shallow incline, weighted down by the burden of his bizarre experiences. Upon reaching the top, he paused for a moment to think; then he saw it. It was a small monastery, perched precariously atop a forbidding crag less than a mile away, but nearly impossible to get to. Was it worth the effort, he wondered. Did it matter?

Reaching the base of the mountain, he began to climb. . . .

Finally, at last, here it is: Incremental plotting!! Huzzah! Hip hip hooray! Three cheers for our side!

Do you realize what this means? Freedom from jumping, thus giving a better illusion of walking down that eerie, lamp-lit corridor, instead of kangarooing. Yeah, neat.

Well, before we get carried away with excess hyperbole, we should work out the details. It's like this: The position within the maze is kept by XC and YC, the X,Y coordinates. So we just add some numbers to give the position within the cell, too. For complete freedom of movement, we would have three numbers, right? Two would be for X,Y positioning within the cell and one would be the angle of orientation. Before we just blithely start in on this, let's think about that.

Moving forward and backward in the cell is a lot easier to show on the screen than left-right movement, and both are far easier than changing the angle of orientation. Moving forward and backward just involves clipping the first cell (the cell you're in) and then drawing the rest the normal way (the next cell gets half the remaining

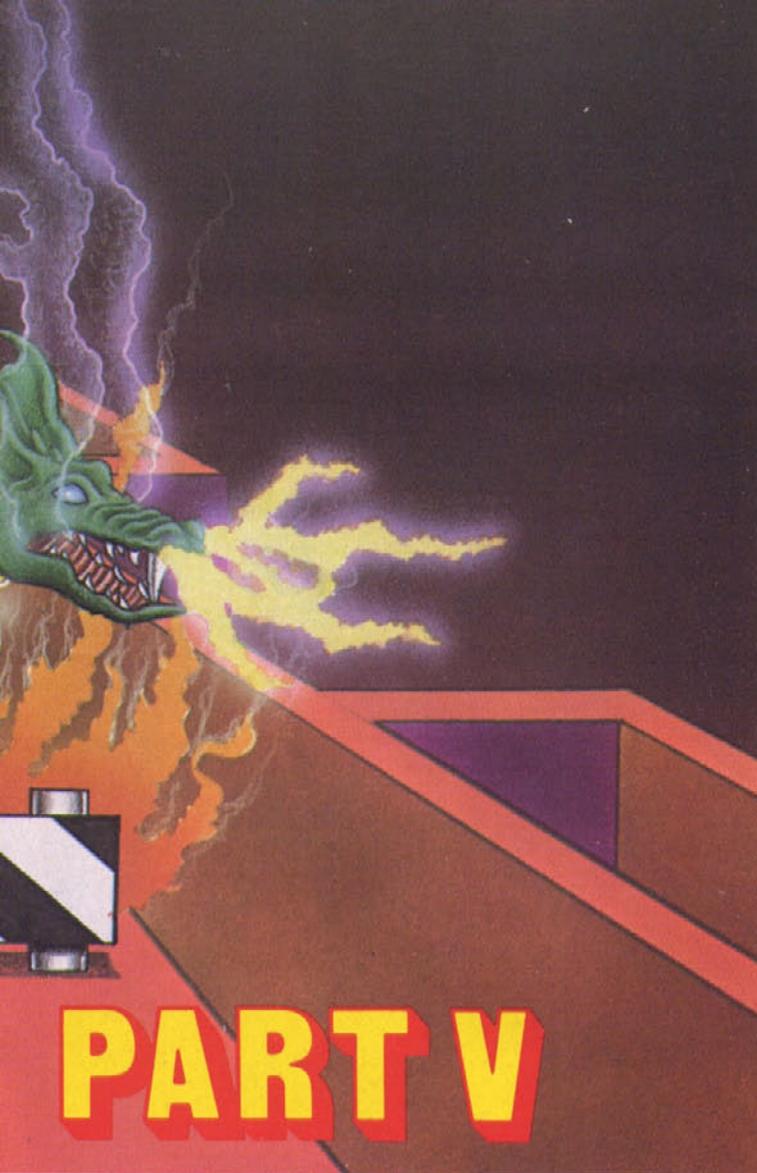
space, and the next cell gets half of that, and so forth).

The next part is harder. Moving left and right means moving the visual center of your position out of the center of the corridor. This is tricky, since the simple but straight perspective rules we worked out in the first article won't exactly apply, and, worse, it opens up more than one new can of worms.

But even that pales next to implementing the third parameter, the angle of orientation. We already have a direction pointer, but it only allows four directions. Consider this: When you're looking straight at a wall, the floor and ceiling lines are all horizontal. And when the wall is to your left or right, the horizontal lines turn into forty-five-degree lines. Those extremes are easy, but the angles in between are not so even and require more calculation. This takes either lots of time or lookup tables and approximations.

So what do we do? Well, let's look at the first case, since it's the easiest. To begin with, we need an increment size to tell us how much of the cell we traverse with each step. Binary powers are nice, so let's make it eight steps per cell. Then, since our window on the world is 128 by 128, that makes the first walls thirty-two dots wide, and each step moves four dots into the cell. That simplifies the clipping for the first cell.

The rest of the cells use the regular rules for plotting, as just mentioned. However, we depart from the strict binary powers that we had before—no problem, really. And, since we're doing things differently, let's do a little bit more and use table lookup for the cell coordinates instead of calculation. Anything to speed things up. That's what the subroutine at 2200 does in listing 1; it looks up X1-X8, Y1-Y8 from two tables, X(n) and Y(n), which contain the precom-



PART V

puted values for a depth of eight cells with eight bit positions each. This will do our wall clipping for us automatically, which makes it worth it, right? We could go even further and encode the possible door values in the tables also, but let's leave that as an exercise for the energetic.

And Now, the Program. Some prefatory notes on implementation. Up to now, we've been erasing the whole screen, then drawing the new maze view. That's pretty wasteful and wipes out anything else that might be there. Why not just erase the maze by setting the color to black and redrawing it? Hey, sounds good. No sooner said than done.

The lookup tables won't cover the doors, so we need to calculate their values. Previously, the values were calculated in the hplot statements. Now, the side panel doors have their coordinates calculated out before plotting. This saves time by preventing repetitious calculating, and it sneaks in the clipping for doors as well. See the blow-by-blow description for details. (The flat panel doors weren't changed; more exercise for you.)

That's the notes. Here are the details.

10-90	Initialize variables, set up matrixes, and load adapter patch
100-120	Clear hi-res screen and draw maze
130-170	Print statistics
180-210	Check for specials and branch if found
220	Input move
230-280	Read potentiometer joystick and branch if move found

290-320	Read adapter interface and branch if move is found
330-420	Read keyboard and branch if move is found; if none of the three gives a move, go back to start of read loop
430-450	Unplot maze, and turn left
460-470	Unplot maze, and turn right
480-490	Plot maze, goto print statistics
500-560	Move forward one-eighth of a cell unless there's a wall in the way
570-630	Move backward one-eighth unless a wall's in the way
640-680	Cell boundary crossed, so update cell X,Y pointers
690-700	Plot maze and goto print statistics
710-730	Teleport
1000	Set color to black for unplot
1010	Set color to green for plot
1020-1070	Set up initial conditions and skip newcell calculation
1080-1090	Get newcell coordinates and new XV,YV
1100	Look at left edge of cell
1110	If no wall, then skip to flat wall check
1120	Plot all except left edge of wall
1030-1150	Only plot left edge if not first cell or if position in first cell is the beginning edge (BC = 0)
1160	Check for door
1170-1190	If door, then check to see if it's in the first cell; if in first cell, see if it's visible or needs clipping
1200	Door visible, but left edge gets clipped off
1210-1220	Calculate door coordinates and plot left edge
1230-1250	Plot rest of door and go to right side plotting
1260	No left wall, so check for front wall in the cell to the left
1270	Found wall, so check for door
1280-1290	Found door, so check to see if it's visible or needs clipping
1300	Plot door
1310	Plot wall
1320-1530	Once again, repeat everything for the right side
1540-1550	If there's a wall at the back of the cell, then skip to finish
1560-1590	Otherwise, get next cell in direction D
1600-1620	And, if depth or resolution permits, go back to newcell coordinate calculations and draw next cell
1630-1640	Refresh cell coordinates and draw end wall
1650-1670	If there's a door in it, calculate XV,YV and draw it
1680	The end
2000-2100	Expand cell number
2200-2240	Get newcell coordinates
2300-2340	Get cell in direction P from current cell
2500-2792	Specials
3000-3650	Read in maze data and lookup tables

Okay, so there is that. First, type in the program (listing 1) and save it. Now, enter the binary program in listing 2; this is the Atari joystick adapter (gizmo) interface. If you haven't got one, skip this part by deleting line 20 and lines 290 through 320 of the Applesoft program. If you have an adapter, type *call -151*, enter the lines as printed in the listing, then type *3D0G* to get back to Applesoft. Now type *bsave BGIZ,A\$300,L\$60* to save it.

After all that, run it. Slow, isn't it? What can we do to speed it up?

There are several ways: From an algorithmic approach, one thing to do is replace line 1000 with *1000 HGR : RETURN*. This will double the speed, since Applesoft takes a long time to erase the maze. But this is just a patch, not an improvement. So what else?

Well, remember perspective. Remember when you were a little kid, going for long rides, staring out the window of the car, and you'd look down at the road zipping by, then look out at the hills way in the distance that never moved? How about that, you thought. Same thing applies to the maze. The first half changes twice as much as the next half, and that changes twice as much as the next

half, and so on. If you actually erase and replot only the parts that change, you can double the speed. Not bad.

But what's the very best way of all? That's right: machine language! Yaaay!

Enter the machine language plot (what do you mean, "What machine language plot"? Send your disk to "The Amazing Maze," care of this magazine) like you did the adapter patch, except for the bsave, which is

```
BSAVE BFAST,A$6000,L$6F6
```

Now modify the program in listing 1. First, delete lines 10 through 30, 1000 through 2340, 3000 through 3150, and 3500 through 3650. Then type in the lines in listing 3. This modifies the program so that it calls the machine language plot instead of the Applesoft one. Save it, and run it.

Much better. Now the improvements will really work and, if done correctly, will speed things up about four times faster, whether the maze is in outline or filled in.

You know, you could animate a filled or outlined maze just by moving black lines and filling in small amounts of dots each time. That would be nice, you say. It would even sell. (It does.) But keep this in mind, you potential game writers and world shakers: Graphics alone do not make a game. You need purpose and plot and variety to keep enthusiasm going. Of course, the graphics are the hardest part, so if you've got that down, then...

And so, the curtain falls, and a series ends—unless we get four or five thousand letters urging a continuance.

Will there ever be another "Amazing Maze" article in the universe? A book? A movie? Maybe a teevee series! National syndication!! Bright lights! Stardom ...!

We regret to announce that the author has had to be hospitalized due to massive ego problems. Only your letters can cure him, plus your floppy disks, with requests for all the programs in this series, specifying Apple or Atari, mailed to "The Amazing Maze," care of this magazine, and including sufficient return postage. He requests that you not send any after June 23, his birthday. Thank you for your patience.

Listing 1.

```
10 LOMEM: 16384
20 PRINT CHR$(4);"BLOAD BGIZ"
30 DIM A%(50,50),X(64),Y(64)
40 HOME
50 VTAB 10: HTAB 6: PRINT "THE MOUNDS OF CTEIA"
60 REM ***** MAZE:3D-PLOTTER
70 GOSUB 3000
80 D = 2:XC = 1:YC = 1:RR = 5
90 BC = 0: HCOLOR = 1
100 HCR
110 GOSUB 1010
120 REM PRINT STATISTICS
130 HOME : VTAB 23: HTAB 35: IF D = 1 THEN PRINT "N";
140 IF D = 2 THEN PRINT "E"
150 IF D = 3 THEN PRINT "S"
160 IF D = 4 THEN PRINT "W"
170 VTAB 24: HTAB 16: PRINT XC;" ";YC;" ";BC;
180 IF SP <> 0 THEN 220
190 XX = XC:YY = YC: GOSUB 2000: IF S = 0 THEN 220
200 SP = 1
210 ON S GOTO 2500,2600,2700,2800,2900
220 VTAB 22: HTAB 1: PRINT "MOVE > ";
230 PX = INT ( PDL (0) / 64):PY = INT ( PDL (1) / 64)
240 DV = PY * 4 + PX
250 IF DV = 1 OR DV = 2 THEN 500
260 IF DV = 4 OR DV = 8 THEN 430
270 IF DV = 7 OR DV = 11 THEN 460
280 IF DV = 13 OR DV = 14 THEN 570
290 CALL 768
300 DIR = PEEK (6)
310 IF DIR > 127 THEN 330
320 ON DIR + 1 GOTO 500,330,460,330,570,330,430,330
330 K = PEEK (49152)
340 IF K < 128 THEN 230
350 AS = CHR$(K - 128)
360 POKE 49168,0
370 IF AS = CHR$(8) THEN 430
380 IF AS = CHR$(21) THEN 460
390 IF AS = " " THEN 500
400 IF AS = "T" THEN 710
410 IF AS = "/" THEN 570
420 GOTO 220
430 GOSUB 1000
440 D = D - 1: IF D = 0 THEN D = 4
```

```
450 GOTO 480
460 GOSUB 1000
470 D = D + 1: IF D = 5 THEN D = 1
480 BC = 3: GOSUB 1010
490 GOTO 130
500 IF BC = 7 THEN 530
510 GOSUB 1000
520 BC = BC + 1: GOTO 690
530 XX = XC:YY = YC: GOSUB 2000:P1 = D: IF T(D) <> 0
THEN 550
540 PRINT CHR$(7): GOTO 220
550 GOSUB 1000
560 BC = 0: GOTO 640
570 IF BC = 0 THEN 600
580 GOSUB 1000
590 BC = BC - 1: GOTO 690
600 XX = XC:YY = YC: GOSUB 2000:P1 = D - 2: PRINT P1:
IF P1 < 1 THEN P1 = P1 + 4
610 IF T(P1) = 0 THEN 540
620 GOSUB 1000
630 BC = 7
640 SP = 0
650 IF P1 = 1 THEN YC = YC - 1
660 IF P1 = 2 THEN XC = XC + 1
670 IF P1 = 3 THEN YC = YC + 1
680 IF P1 = 4 THEN XC = XC - 1
690 GOSUB 1010
700 GOTO 130
710 HOME : VTAB 22: HTAB 1
720 INPUT "TELEPORT TO (X,Y,B) ";XC,YC,BC
730 GOTO 100
1000 HCOLOR = 0: GOTO 1020
1010 HCOLOR = 1
1020 CX = 65:CY = 65
1030 R = 0
1040 GOSUB 2200
1050 XV = 8:YV = 16
1060 X = XC:Y = YC
1070 GOTO 1100
1080 GOSUB 2200
1090 XV = INT ( (X5 - X1) / 8) * 2:YV = INT ( (Y4 - Y1) / 16) * 2
1100 P = D - 1: IF P = 0 THEN P = 4
1110 XX = X:YY = Y: GOSUB 2000: IF T(P) = 1 THEN 1260
1120 HPLLOT X4,Y4 TO X8,Y8 TO X5,Y5 TO X1,Y1
1130 IF R <> 0 THEN 1150
1140 IF BC <> 0 THEN 1160
1150 HPLLOT X1,Y1 TO X4,Y4
1160 IF T(P) <> 2 THEN 1320
1170 IF R <> 0 THEN 1210
1180 IF BC > 5 THEN 1320
1190 IF BC < 2 THEN 1210
1200 Y1 = Y1 + YV: GOTO 1230
1210 X1 = X5 - XV - YV:Y4 = Y8 + XV + YV:Y1 = Y5 - XV
1220 HPLLOT X1,Y4 TO X1,Y1
1230 Y5 = Y5 + XV:Y8 = Y8 + XV:X5 = X5 - XV
1240 HPLLOT X1,Y1 TO X5,Y5 TO X5,Y8
1250 GOSUB 1320
1260 GOSUB 2300:XX = XE:YY = YE: GOSUB 2000: IF T(D) = 1
THEN 1320
1270 IF T(D) = 0 THEN 1310
1280 IF R <> 0 THEN 1300
1290 IF BC > 3 THEN 1310
1300 HPLLOT X5 - YV,Y8 TO X5 - YV,Y5 + YV TO X1,Y5 + YV
1310 HPLLOT X1,Y5 TO X8,Y5 TO X8,Y8 TO X1,Y8
1320 P = D + 1: IF P = 5 THEN P = 1
1330 XX = X:YY = Y: GOSUB 2000: IF T(P) = 1 THEN 1480
1340 HPLLOT X3,Y3 TO X7,Y7 TO X6,Y6 TO X2,Y2
1350 IF R <> 0 THEN 1370
1360 IF BC <> 0 THEN 1380
1370 HPLLOT X2,Y2 TO X3,Y3
1380 IF T(P) <> 2 THEN 1540
1390 IF R <> 0 THEN 1430
1400 IF BC > 5 THEN 1540
1410 IF BC < 2 THEN 1430
1420 Y2 = Y2 + YV: GOTO 1450
1430 X2 = X6 + XV + YV:Y3 = Y7 + XV + YV:Y2 = Y6 - XV
1440 HPLLOT X2,Y3 TO X2,Y2
1450 Y6 = Y6 + XV:Y7 = Y7 + XV:X6 = X6 + XV
1460 HPLLOT X2,Y2 TO X6,Y6 TO X6,Y7
1470 GOTO 1540
1480 GOSUB 2300:XX = XE:YY = YE: GOSUB 2000: IF T(D) = 1
THEN 1540
1490 IF T(D) = 0 THEN 1530
1500 IF R <> 0 THEN 1520
1510 IF BC > 3 THEN 1530
1520 HPLLOT X6 + YV,Y7 TO X6 + YV,Y6 + YV TO X2,Y6 + YV
1530 HPLLOT X2,Y6 TO X7,Y6 TO X7,Y7 TO X3,Y7
1540 XX = X:YY = Y: GOSUB 2000:N = T(D)
1550 IF N <> 1 THEN 1630
1560 IF D = 1 THEN Y = Y - 1
1570 IF D = 2 THEN X = X + 1
1580 IF D = 3 THEN Y = Y + 1
1590 IF D = 4 THEN X = X - 1
1600 R = R + 1: IF R = RR THEN 1680
1610 IF CX - X5 < 5 THEN 1680
1620 GOTO 1080
1630 GOSUB 2200
1640 HPLLOT X5,Y5 TO X6,Y6 TO X7,Y7 TO X8,Y8 TO X5,Y5
```

```

1650 IF N <> 2 THEN 1680
1660 XV = INT ((X2 - X1) / 16) * 2: YV = INT ((Y4 - Y1) / 16) * 2
1670 H$ = X8 + XV, Y8 TO X5 + XV, Y5 + YV TO X6 - XV, Y6
    + YV TO X7 - XV, Y7
1680 RETURN
2000 T = A%(XX,YY)
2010 IF T < 0 THEN T = T + 65536
2020 S = INT (T / 4096)
2030 T = T - S * 4096
2040 T(1) = INT (T / 512)
2050 T = T - T(1) * 512
2060 T(2) = INT (T / 64)
2070 T = T - T(2) * 64
2080 T(3) = INT (T / 8)
2090 T(4) = T - T(3) * 8
2100 RETURN
2200 X1 = X(BC * 8 + R): Y1 = X1: X4 = X1: Y2 = X1
2210 X2 = Y(BC * 8 + R): Y3 = X2: X3 = X2: Y4 = X2
2220 X5 = X(BC * 8 + R + 1): Y5 = X5: X8 = X5: Y6 = X5
2230 X6 = Y(BC * 8 + R + 1): Y7 = X6: X7 = X6: Y8 = X6
2240 RETURN
2300 XE = X: YE = Y: IF P = 1 THEN YE = YE - 1
2310 IF P = 2 THEN XE = XE + 1
2320 IF P = 3 THEN YE = YE + 1
2330 IF P = 4 THEN XE = XE - 1
2340 RETURN
2500 HOME : VTAB 21: HTAB 1
2510 PRINT "THERE ARE STAIRS GOING UP. DO YOU?"
2520 PRINT "WANT TO TAKE THEM? ";
2525 GET A$: IF A$ = "Y" THEN 2540
2530 IF A$ = "N" THEN 100
2535 GOTO 2525
2540 TEXT : HOME : VTAB 5
2550 PRINT "YOU'RE OUT OF THE DUNGEON. IT'S A"
2560 PRINT "NICE DAY, ISN'T IT?"
2570 VTAB 15: END
2600 HOME : VTAB 21: HTAB 1
2605 IF PB = 1 THEN 2650
2610 PRINT "THERE'S A POT HANGING FROM THE CEILING."
2615 PRINT "INSIDE IT IS A PURPLE BUNNY AMULET."
2620 PRINT "DO YOU WANT IT? ";
2625 GET A$: IF A$ = "N" THEN 100
2630 IF A$ = "Y" THEN PB = 1: SP = 0: GOTO 100
2635 GOTO 2625
2650 PRINT "THERE'S AN EMPTY POT HANGING FROM"
2660 PRINT "THE CEILING. NOTHING ELSE IS IN HERE."
2670 FOR I = 1 TO 3000: NEXT I
2680 GOTO 120
2700 HOME : VTAB 21: HTAB 1
2710 IF PB = 1 THEN 2750
2720 PRINT "AS YOU ENTER, A VIOLENT ODOUR"
2730 PRINT "ASSAULTS YOUR NOSTRILS. A TERMAGANT"
2735 PRINT "FALLS FROM THE CEILING AND CRIES"
2740 PRINT "YOU HAVE NO BUNNY, SO DIE! "; CHR$(7);
    CHR$(7);
2741 FOR I = 1 TO 1000: NEXT I
2742 PRINT : PRINT "SO YOU DIE A HORRIBLE DEATH. ";
2743 FOR I = 1 TO 5000: NEXT I
2744 TEXT : HOME : END
2750 PRINT "AS YOU ENTER, A VIOLET MUSKY ODOUR"
2760 PRINT "CAresses YOUR NOSTRILS. A TERMAGANT"
2770 PRINT "DROPS FROM THE CEILING AND CROONS"
2780 PRINT "YOU HAVE THE BUNNY!! "; CHR$(7); CHR$(
    7); CHR$(7);
2790 FOR I = 1 TO 1000: NEXT I
2791 PRINT : PRINT "YOU WIN"
2792 GOTO 2743
3000 READ MX: READ MY
3040 FOR I = 1 TO MY
3050 FOR J = 1 TO MX
3060 READ A%(J,I)
3070 NEXT J,I
3090 FOR I = 0 TO 63
3100 READ X(I)
3110 NEXT I
3120 FOR I = 0 TO 63
3130 READ Y(I)
3140 NEXT I
3150 RETURN
3190 DATA 11,13
3200 DATA 4104,72,65,9,16,80,1,64,17,8208,8
3210 DATA 520,576,9,640,1090,1089,65,65,1153,1026,520
3220 DATA 584,65,577,73,65,65,65,65,65,521
3230 DATA 520,528,9,520,72,65,65,73,65,9,520
3240 DATA 576,1025,528,584,521,64,1,520,0,584,521
3250 DATA 72,73,1033,520,576,65,65,577,65,513,520
3260 DATA 576,8,513,584,65,81,73,73,65,65,521
3270 DATA 72,65,9,520,16,1032,584,521,72,17,520
3280 DATA 528,8,520,520,1088,513,584,521,528,1024,520
3290 DATA 1032,576,577,577,65,65,577,577,1089,65,513
3300 DATA 648,74,9,80,65,65,137,66,65,9,12304
3310 DATA 648,586,649,1170,66,1,520,72,65,513,1032
3320 DATA 640,578,513,1024,64,65,513,576,65,65,513
3500 DATA 1,33,49,57,61,63,63,63
3510 DATA 1,29,47,55,59,61,63,63
3520 DATA 1,25,45,55,59,61,63,63
3530 DATA 1,21,43,53,59,61,63,63
3540 DATA 1,17,41,53,59,61,63,63

```

```

3550 DATA 1,13,39,51,57,61,63,63
3560 DATA 1,9,37,51,57,61,63,63
3570 DATA 1,5,35,49,57,61,63,63
3580 DATA 129,97,81,73,69,67,67,67
3590 DATA 129,101,83,75,71,69,67,67
3600 DATA 129,105,85,75,71,69,67,67
3610 DATA 129,109,87,77,71,69,67,67
3620 DATA 129,113,89,77,71,69,67,67
3630 DATA 129,117,91,79,73,69,67,67
3640 DATA 129,121,93,79,73,69,67,67
3650 DATA 129,125,95,81,73,69,67,67

```

Listing 2.

```

0300: A9 00 2C 5C C0 2C 5A C0
0308: 2C 59 C0 AE 61 C0 10 02
0310: 09 08 2C 5B C0 AE 61 C0
0318: 10 02 09 02 2C 58 C0 AE
0320: 61 C0 10 02 09 01 2C 5A
0328: C0 AE 61 C0 10 02 09 04
0330: AA BD 45 03 85 06 2C 5D
0338: C0 A9 FF AE 61 C0 10 02
0340: A9 01 85 07 60 80 04 00
0348: FF 02 03 01 FF 06 05 07
0350: FF FF FF FF FF 00 58 58
0358: 75 75 58 58 75 75 58 58

```

Listing 3.

```

10 PRINT CHR$(4); "BLOAD BFINAL"
20 PRINT CHR$(4); "BLOAD BGIZ"
530 SP = 0: XX = XC: YY = YC: GOSUB 2000: P1 = D: IF T(D)
    <> 0 THEN 550
600 SP = 0: XX = XC: YY = YC: GOSUB 2000: P1 = D - 2: PRINT
    P1: IF P1 < 1 THEN P1 = P1 + 4
640 REM UPDATE POINTERS
1000 GOSUB 1020
1005 CALL 24579
1006 RETURN
1010 GOSUB 1020
1015 CALL 24583
1016 RETURN
1020 POKE 8, XC - 1: POKE 9, YC - 1: POKE 76, BC: POKE 75, D
    - 1: POKE 77, RR: RETURN
2000 POKE 888, XX - 1: POKE 889, YY - 1
2010 CALL 24576
2020 S = PEEK (890)
2030 FOR I = 1 TO 4: T(I) = PEEK (890 + I): NEXT I
2040 RETURN
3000 READ MX: READ MY
3040 FOR I = 1 TO MY
3050 FOR J = 1 TO MX
3060 READ K
3070 IF K < 0 THEN K = K + 65536
3080 K2 = INT (K / 256): K1 = K - K2 * 256
3090 A = 16254 + I * 128 + J * 2
3100 POKE A, K2: POKE A + 1, K1
3110 NEXT J, I
3130 RETURN

```

In response to a plea entered by reader Jack Hamilton last issue, Billy Starita of 44 Kenyon Avenue, West Babylon, NY 11704, is producing program listings of portions of "The Amazing 3-D Maze" for the IBM pc. Billy is offering them to all interested parties on the same basis as *Softline's* Apple and Atari versions: Send him a formatted DOS 1.10 disk and a self-addressed stamped mailer and he'll send you the programs. He probably won't be as soft as we are and send you the programs even if you don't include return postage, nor is he likely to have a lot of excess disk mailers lying around that he wants to get rid of. *Softline* assumes no liability, et cetera, et cetera.

However, Tim Thibault sent us a conversion of the full program from the March issue, with permission to send out as many copies of it as we get asked for. Same rules apply as above, only you send your disk to Amazing IBMaze, *Softline*, Box 60, North Hollywood, CA 91603.

The End
of
"The Amazing 3-D Maze"
but Brian Fitzgerald will be back
in
"Gamefinger"



Part 6: A Change of Tone

This column's title has a double meaning. The original meaning has to do with the topic at hand: custom waveforms on the Atari. There has been a lot of interest in the subject lately, and with good reason. Custom waveshaping can produce realistic sound effects, good instrumental imitations, and probably one of the hottest fads in the industry right now: voice synthesis. It's a ripe topic for a series on sound generation.

All these techniques, however, depend heavily on assembly language. Higher-level languages are not efficient enough to drive the speaker at the needed frequencies. Furthermore, as we continue to expand the range of sounds available to us, we're going to keep running into this situation. Hence the second meaning of the title: The tone of this column is going to take a serious bend toward assembly language.

This should not be a cause for panic amongst Basic programmers. Every effort will be made to provide hybrid code that will be useful or interesting to you. This month is a case in point: The Basic listing provides a convenient method for producing sine waves that could easily be adapted for different purposes. If you are familiar with assembly, of course, you will be able to experiment more fully with custom waveforms.

Thus ends the editorial. Let's talk about sound.

From our previous discussion of waveform cancellation, you should be getting a feel for what a sound wave is: a rhythmic series of pulses in the air. The shape of each pulse is what we call the waveform, and it determines the character of the sound. To make a sweeping generalization, waveshapes with sharp edges sound buzzy, or harsher, than waveforms with rounded edges. Anyone interested in obtaining a wider range of tones from the Atari, then, should take an interest in custom waveform generation, for it offers a greater control over the character of a sound.

If you are having trouble visualizing just what a waveform *does*, let's review with an example we all know and love, the Atari's "pure tone" distortion parameter 10. The normal waveform output by this setting is a square wave, a simple up/down, on/off shape that is perfectly suited to digital electronics. When translated to the speaker, a square wave means (1) Start fully retracted; (2) instantaneously become fully extended; (3) instantaneously become fully retracted again.

Which, incidentally, is why you don't really hear a true square wave. Matter transmission has not yet been invented, and the speaker cannot truly jump from one point in space to another. It does, however, move there as fast as it can, and the sound is about the same.

The key point to realize is that a waveform is a set of "instructions" to the speaker cone having to do with its pattern of movement. When we output a waveform to the speaker, it dances back and forth in time to the waveshape we give it. This vibrating paper cone then pushes the air, which in turn pushes a membrane in our ear. The whole point of sound generation, then, is to deliver an interesting pattern of back/forth movement to our eardrum.

Fortunately, a speaker has more than two positions it can occupy, so it can reproduce zillions of patterns besides on/off/on/off. Let's say that our speaker has sixteen different positions, with 0 being fully retracted and 15 fully extended. Producing different waveshapes would involve sending out a repetitive series of numbers between 0 and 15. The pattern of numbers would determine the waveshape and hence the character of the tone. The pitch, or frequency, of the sound would depend on how quickly the sequence repeated itself. Faster sequences occur at a higher frequency and thus have a higher pitch.

As you might now guess, the Atari provides us with a way to communicate directly with the speaker cone and deliver our own pattern of "instructions," or our own waveshape. By setting bit 4 in AUDCX, we enable a special mode called forced output, which passes the volume parameter directly to the speaker in the form of a fixed voltage. In this way we can make the speaker dance in any pattern we want (within some very definite limits).

If you don't remember AUDCX, it's the audio control register for each voice, referred to as AUDC1 (address \$D201), AUDC2 (\$D203), and so on. The top nibble of AUDCX contains the distortion parameter for the channel, and the bottom nibble contains the volume information. A pure tone of volume 8, for example, is \$A8, the \$A (decimal 10) for pure tone, the 8 for volume. Implementing forced output simply involves storing a value between \$10 and \$1F in a channel's AUDC register. A value of \$10 retracts the speaker, \$1F fully extends the speaker, and values between these extremes put the speaker in a corresponding middle position.

For example, successively storing the values \$10,\$1F,\$10,\$1F... in AUDC1 will produce the square wave normally produced by the pure tone setting in channel 1. (Except it will be a result of your own labor, and will therefore sound much better!) A more interesting sequence might be:

\$10,\$14,\$18,\$1C,\$1F,\$10,\$14,\$18,\$1F...
which would produce a ramp wave.

There are, however, some drawbacks to forced output that you should be aware of. The first one is a biggie: processor time. To produce a high frequency, the 6502 must devote all of its resources to the production of the waveform. This means your program will grind to a halt every time you want it to sing. No graphics changes, nothing. That isn't the whole story, though. To produce an undistorted waveform, all interrupts must be disabled, as must all DMA.

If you're not familiar with these terms, they refer to events that momentarily interrupt the 6502 from running your program. Whenever a key is pressed, a keyboard interrupt occurs, and the 6502 saves all the information it was working with, jumps to a program to handle the interruption, and then returns to your program after recovering the information it saved. It's kind of like reading a book during a conversation: You're always putting a finger on the page so you can answer a question. You don't get a lot of reading done this way, and the 6502 doesn't get a lot of computing done. DMA stands for direct memory access, and it happens whenever the screen dis-

play is generated. ANTIC (the chip that handles the display) stops the 6502 so it can borrow the address and data lines. These constant interruptions create buzzing "gaps" in the waveform that must be stopped.

What does this mean to the user? Well, ugliness. Whenever the sound routine is entered, the display flashes off and is replaced by the background color. If the background color is black, it looks remarkably like a system crash. Also, if the routine is entered and exited repeatedly, like the demo, the flashing will drive all but a blind man to distraction.

What can be done about it? Precious little. Storing the normal screen color (in graphics 0, \$94) in the background register helps. This means that just the text flashes on and off. Yes, it's still ugly.

There are other limitations, too. Memory usage is one of them. Voice synthesis was mentioned earlier as a spin-off of forced output mode; the idea of voice synthesis without having to buy any additional peripherals is indeed exciting, and there are some programs on the market now that do exactly that. Unfortunately, the data storage requirements for even a simple sentence are staggering, and the serious programmer must carefully consider what options will be given up for the added sexiness of voice output. A lot of machine code can fit into the space reserved for "We got you, Earth slime!" This is not to say that voice synthesis has no place in the Atari, just that some serious soul-searching should be conducted before the decision is made.

The Demo. The demo shows a more modest use of forced output: It provides a way to play custom waveforms from Basic. As written, the demo plays sine waves, which are considerably more soothing than square waves and should be a welcome change of tone for the nonprogrammers in your house.

The assembler listing is fully commented and should be easy to follow. It accepts a waveform table length, note duration, and frequency from Basic. The wave table is fixed on page six, and can be a maximum of 256 steps long. The duration and frequency can likewise be any number between 0 and 255.

```

;*****
;* Forced Output Demo *
;* Assembler Listing *
;*****

```

```

NMIEN = $D40E
IRQEN = $D20E
DMACTL = $D400
AUDC = $D201
AUDCTL = $D208
SKCTL = $D20F
COLBK = $D01A
DUMMY = $D01E

```

```

;
WVTAB = $600
;

```

```

ORG $CB
WVTL DS 1
DURA DS 2
WVPNT DS 1
WFREQ DS 1
WCNT DS 1
;

```

```

ORG $4000 ;(relocatable)
;

```

```

PLA ;number of args
PLA ;wave table length hi
PLA ;wave table length lo
STA WVTL
PLA ;duration hi
PLA ;duration lo
STA DURA+1
PLA ;freq hi
PLA ;freq lo
STA WFREQ ;store freq
STA WCNT

```

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```

LDA #0 ;init pointer
STA WVPNT
;no interrupts, no DMA
STA NMIEN
STA IRQEN
STA DMACTL
;init audio
STA AUDCTL
STA DURA
LDA #3
STA SKCTL
;color the screen
LDA #$94
STA COLBK
;
PLAYIT DEC WCNT ;dec freq cnt
BEQ DOVOX
;waste some machine cycles
WASTE LDX #5
DEX
BNE WASTE
STA DUMMY,X
BEQ UPDUR
DOVOX LDA WFREQ ;recharge cnt
STA WCNT
;get index into wave table
LDY WVPNT
;get volume and set force output
LDA WVTAB,Y
ORA #$10
;punch the speaker
STA AUDC
;move the wave pointer
INY
;check for table end
CPY WVTL
BCC NOWRAP
;wrap pointer
LDY #0
NOWRAP STY WVPNT
;update duration counter
UPDUR DEC DURA
BNE PLAYIT
DEC DURA+1
BNE PLAYIT
;time's up, return to Basic
LDA #$FF
STA NMIEN
STA IRQEN
RTS
;
END

```

No real tricks are used in the code, but notice the placing of the delay mechanism: It is important to place the delay in between each step of the waveform, so that the waveshape is preserved. Also note that if the time has not yet been reached to output another wave step, a small delay is entered to equalize the run time of the loop.

There are two distorting factors: Every 256 iterations, an additional seven machine cycles are used to update the high byte of the duration count, and every time the waveform is repeated, an additional two cycles are used. Purists may cringe, but when the 6502 is clicking along at 1.79 MHz, the lost cycles are minimal.

Note, too, that the assembler portion forces AUDCX bit 4 set to 1, so that Basic can just pass the volume bits through the waveform table. Setting a specific bit is a lot easier in assembler than in Basic.

The Basic routine first pokes the machine code into place (lines 29 through 50), then compiles the waveform table. The formula used will form a sine wave composed of LNG steps. The value of LNG may be changed (line 9) to any value up to 255. The larger the waveform table, the greater will be the resolution of the sine wave, and thus it

will more accurately depict a true sine wave (in more subjective terms, it will sound "mellower"). As the waveform gets longer, however, the highest frequency decreases, because there are more steps to cover before the shape repeats. Sine waves sound best at higher frequencies, and so long wavelengths are not very useful with this formula. Other waveforms work a lot nicer in the lower frequencies—try the ramp waveform discussed earlier.

After poking in the waveform, Basic reads off a frequency from the data table at lines 26 and 27, and calls the machine language speaker driver.

The demo is easily modifiable for different waveforms; just poke your desired sequence from locations 1536 to 1791. Waveshapes could be read in from a data table or entered in with any bizarre editing scheme you might think of. There is a lot of potential for experimentation here, even without digging into the assembler portion.

Oh yes; always remember to save hybrid code before you run it. A single error in the machine code data statements will very likely eat up the program, the operating system, DOS, your cat. . . .

```

0001 REM *****
0002 REM *FORCED OUTPUT DEMO*
0003 REM *   by Bill Williams   *
0004 REM *       Basic Listing  *
0005 REM *****
0006
0007 GOSUB 0029
0008 SETCOLOR 4,9,4
0009 LNG=10:TEMPO=10
0010 ? "Waveshape:"
0011 FOR L=0 TO LNG-1
0012     N=INT(SIN(L*6.2831853/LNG)*7)+7
0013     POKE 1536+L,N
0014     ? N;" ";
0015 NEXT L
0016 FOR REPEAT=1 TO 4
0017     RESTORE 0025
0018     FOR MELODY=1 TO 14
0019         READ N
0020         Q=USR(ADR(QQQ$)+1,LNG,TEMPO,N)
0021     NEXT MELODY
0022 NEXT REPEAT
0023 END
0024
0025 REM Melody notes
0026 DATA 2,16,8,4,2,4,2,16
0027 DATA 20,16,20,18,16,15
0028
0029 REM Machine code (double-check!)
0030 DATA 104,104,104,133,203,104,104
0031 DATA 133,205,104,104,133,207,133
0032 DATA 208,169,0,133,206,141,14,212
0033 DATA 141,14,210,141,0,212,141,8
0034 DATA 210,133,204,169,3,141,15,210
0035 DATA 169,148,141,26,208,198,208
0036 DATA 240,10,162,5,202,208,253,157
0037 DATA 30,208,240,23,165,207,133,208
0038 DATA 164,206,185,0,6,9,16,141,1
0039 DATA 210,200,196,203,144,2,160,0
0040 DATA 132,206,198,204,208,215,198
0041 DATA 205,208,211,169,255,141,14
0042 DATA 212,141,14,210,96
0043
0044 DIM QQQ$(1),QQQ(17)
0045 RESTORE 0029
0046 FOR QQL=ADR(QQQ$)+1 TO ADR(QQQ$)+97
0047     READ QQB
0048     POKE QQL,QQB
0049 NEXT QQL
0050 RETURN
0051

```

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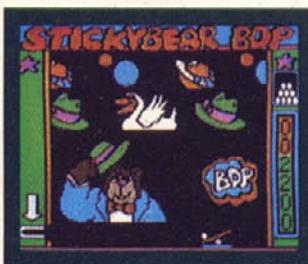


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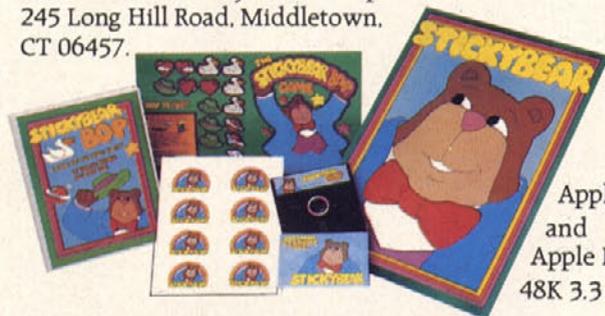
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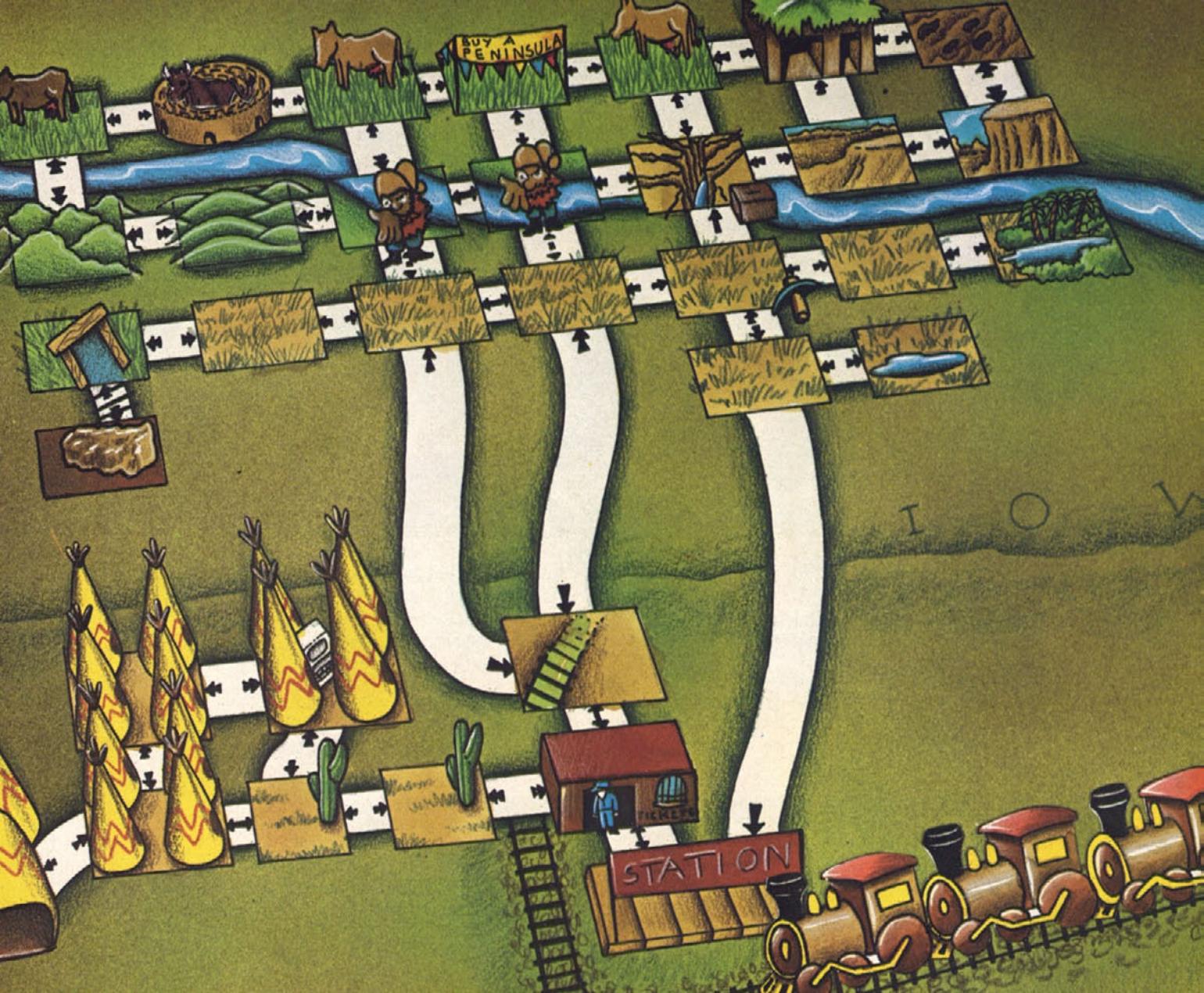


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Costello: "Abbott, look at my new jacket."

Abbott: "It's very nice. . . It's made out of hide."

Costello: "Hide? What's hide?"

Abbott: "Hide . . . hide! The cow's outside!"

Costello: "Who's afraid of a cow?"

That old routine, pard, serves as this month's motif in text adventure writing and programming.

First, as theme: Let us journey back to the thrilling days of yesteryear in the Old West, when men were men, women were women, and cows were cows.

Second, as inspiration: One of the advantages of text adventure is the opportunity they afford the uninitiated to follow through, with a greater or lesser degree of difficulty, the adventures themselves. Such adventures also lend themselves to listing the program out if players get stuck and (dare we say?) cheat. By making this adventure long, and by using variables to contain the vocabulary rather than matching if-then conditions to the words themselves, we are able to hide the logic (if there be same) of the adventure. Originally, the whole thrust of the program was to demonstrate more elaborate hiding techniques, but we'll put them on the back burner for now in favor of adding a few more features in our search for the perfect adventure.

Our first new feature is the use of short and long descriptions. Lines 240 and 250 allow us to continually display long descriptions by

using the command `VERBY` when playing the game. By using the command `LEVER`, only the short descriptions will be displayed for a room that you have previously entered.

The second addition is a save feature. In response to a comment of Charlie Mastrovich and Richard Turro, who point out that in long adventures a save feature is a must, one has been added. The save feature (and its companion, load) is written for an Apple II disk system. What it is written for is really immaterial. No matter what kind of computer you have, you should know how to store and recover variables from tape or disk. If you don't know, it's a worthwhile effort to find out. With any computer, the important thing is to save or load (as the case may be) the variables shown in lines 4540 and 5040.

Finally, there are several points in the program at which you can insert your own routines. You will find a couple of locations in which there is locoweed, one location where there is a "pizened waterhole," and one location where a terrible storm rages. The intention is to have the herd scatter when you blunder into these locations, although, as written, the program just gives the threatening messages.

The usual comment to non-Apple users applies—if your computer uses Integer Basic (such as the Atari and TI), the following parser should be used instead of the one in lines 100 through 170:

```
100 REM PARSER
```

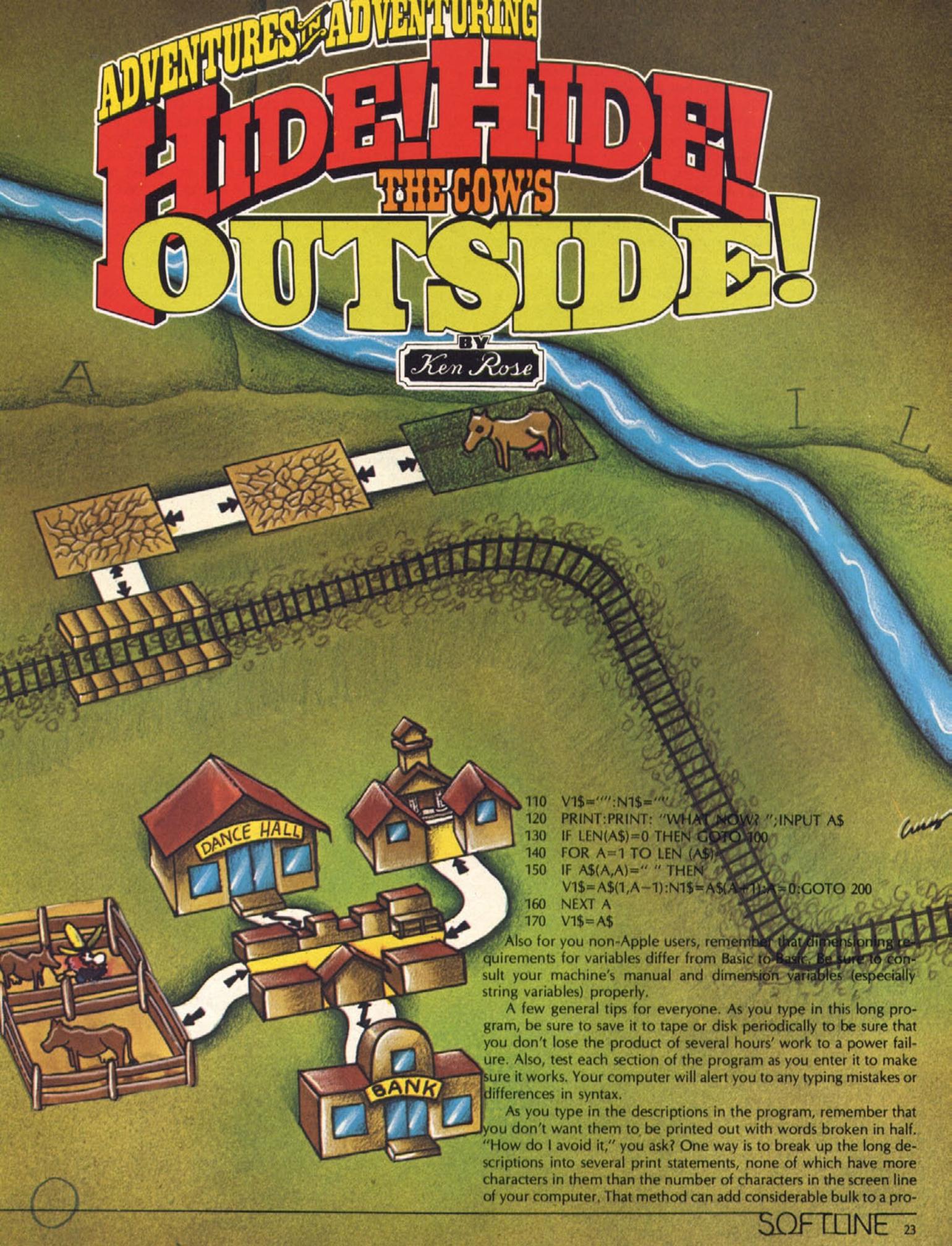
ADVENTURES IN ADVENTURING

HIDE! HIDE!

THE COW'S

OUTSIDE!

BY
Ken Rose



```

110 V1$="":N1$=""
120 PRINT:PRINT: "WHAT NOW? ";INPUT A$
130 IF LEN(A$)=0 THEN GOTO 100
140 FOR A=1 TO LEN (A$)
150 IF A$(A,A)=" " THEN
    V1$=A$(1,A-1):N1$=A$(A+1):A=0:GOTO 200
160 NEXT A
170 V1$=A$

```

Also for you non-Apple users, remember that dimensioning requirements for variables differ from Basic to Basic. Be sure to consult your machine's manual and dimension variables (especially string variables) properly.

A few general tips for everyone. As you type in this long program, be sure to save it to tape or disk periodically to be sure that you don't lose the product of several hours' work to a power failure. Also, test each section of the program as you enter it to make sure it works. Your computer will alert you to any typing mistakes or differences in syntax.

As you type in the descriptions in the program, remember that you don't want them to be printed out with words broken in half. "How do I avoid it," you ask? One way is to break up the long descriptions into several print statements, none of which have more characters in them than the number of characters in the screen line of your computer. That method can add considerable bulk to a pro-

gram of this size, so many programmers use another way.

When you're typing a description, keep an eye on the opening quotation mark. Draw an imaginary line straight down from its right side. If you type a word in the description that starts out on one side of that line and ends on the other, that word will break. When you get to that point, back up and write over the word with spaces. When the cursor is directly underneath the first character after the quotation mark, start the word there.

One other thing: Sometimes a word will end with the last character directly under the quote. That word won't break, but if you put a space after it, the next word will be indented by one space. The thing to do here is to run the two words together. It looks strange when you list the program, but everything falls into place when you run it.

Some of you have run into memory limitations on these programs, and this one is very long—almost eighteen thousand bytes the way it is written. There are many rem (remark) statements scattered through the program to explain what each section does and how they all relate to each other. These can be eliminated if memory is a problem. If you still have a memory shortage, don't despair. The room descriptions starting at line 2500 and going through line 3500 are long and use up a lot of memory. Each individual room description can be shortened to free up a lot more memory.

Best of luck, and "Ride 'em, cowboy."

(For those of you who are interested and who read last issue's column regarding the Text Adventure Writers Guild, Mr. Rose states he has submitted this to them and it has been conditionally accepted. He has also been conditionally allowed to remain. More about this later.)

```
10 HOME : VTAB 10: PRINT TAB( 5) "HIDE, HIDE, THE COW'S
    OUTSIDE!!!": PRINT : PRINT : PRINT TAB( 5) "A SOFTLINE
    ADVENTURE": PRINT : PRINT : PRINT TAB( 19) "BY": PRINT :
    PRINT: PRINT TAB( 16) "KEN ROSE": FOR A = 1 TO 5000:
    NEXT A: HOME
20 DIM N(43),S(43),E(43),W(43),RD(43): REM DIMENSIONS
    VARIABLES
30 FOR A = 1 TO 43: REM LOADS ROOM VARIABLES
40 READ N(A),S(A),E(A),W(A)
50 NEXT
60 READ A0$,A1$,A2$,A3$,A4$,A5$,A6$,A7$,
    A8$,A9$,B0$,B1$,B2$,B3$,B4$,B5$,B6$,B7$,
    B8$,B9$,C0$,C1$,C2$,C3$,C4$,C5$,C6$,C7$,C8$,
    C9$,D0$,D1$,D2$,D3$,D4$,D5$,D6$,
    D7$,D8$,D9$,E0$,E1$,E2$,E3$: REM LOADS WORD
    VARIABLES
70 OB(1) = 28:OB(4) = 21:OB(6) = 19:OB(7) = 13:C1 = 12:C2
    = 14:C3 = 2:C4 = 38: REM PLACES OBJECTS IN ROOMS
80 PRINT : PRINT "DO YOU WANT TO LOAD PREVIOUSLY
    SAVED GAME (TYPE YES OR NO)? "": INPUT
    """:A$: HOME :
    IF A$ = "YES" THEN GOTO 5000
90 R = 1: GOSUB 2500: GOSUB 580: REM SETS UP FIRST
    ROOM
100 REM PARSER
110 PRINT :V1$ = """:N1$ = """: PRINT "WHAT NOW? "":
    INPUT """:A$
120 FOR A = 1 TO LEN (A$): IF MID$(A$,A,1) = " " THEN
    X = A - 1:A = 0: GOTO 150
130 NEXT A
140 V1$ = A$: GOTO 200
150 V1$ = LEFT$ (A$,X)
160 IF RIGHT$ (A$, LEN (A$) - X) = " " THEN N1$ = """:
    GOTO 200
170 N1$ = RIGHT$ (A$, LEN (A$) - (X + 1)):X = 0
200 REM VERB HANDLING ROUTINE
202 IF V1$ = "SAVE" THEN GOTO 4500
204 IF V1$ = "QUIT" THEN GOTO 4000
210 IF Q1 = 1 THEN Q1 = 0: GOTO 1620: REM Q1 IS BULL
```

ROUTINE FLAG

```
220 IF Q3 = 1 THEN GOTO 2100: REM TRAIN IS STOPPED
    AND CLOCK IS TICKING
230 IF V1$ = "NORTH" OR V1$ = "N" OR V1$ = "SOUTH"
    OR V1$ = "S" OR V1$ = "EAST" OR V1$ = "E" OR V1$ =
    "WEST" OR V1$ = "W" THEN Q2 = 0: GOTO 400
240 IF V1$ = E0$ THEN WO = 1: PRINT : PRINT "OKAY,
    LONG DESCRIPTIONS COMING UP.": GOTO 100
250 IF V1$ = E1$ THEN WO = 0: PRINT : PRINT "OKAY, BACK
    TO SHORT DESCRIPTIONS.": GOTO 100
260 IF Q2 = 1 THEN Q2 = 0: GOTO 1870: REM Q2 IS YUCKO
    SAM PAYOFF ROUTINE FLAG
270 IF V1$ = B1$ OR V1$ = B2$ OR V1$ = B3$ THEN X = 44:
    PRINT : PRINT "YOU ARE CARRYING: ": PRINT : GOTO
    600: REM INVENTORY ROUTINE
280 IF V1$ = A0$ OR V1$ = A1$ THEN GOTO 800: REM GET
    ROUTINE
290 IF V1$ = A3$ THEN GOTO 1100: REM DROP ROUTINE
300 IF V1$ = B6$ THEN GOTO 1400: REM DIG ROUTINE
310 IF V1$ = D5$ AND OB(5) = 45 AND OB(7) = R AND OB(4)
    = 44 THEN GOTO 1670: REM ROPE
320 IF N1$ = D5$ AND OB(5) = 45 AND OB(7) = R AND OB(4)
    = 44 THEN GOTO 1670: REM ROPE
330 IF V1$ = A4$ AND OB(7) = 44 AND R = 23 THEN OB(7) =
    23: PRINT : PRINT "THE BULL IS TIED TO THE HITCHING
    POST.": GOTO 100: REM TIE
340 IF V1$ = E2$ AND OB(7) = 23 THEN PRINT : PRINT
    "OKAY, YOU'RE LEADING THE BULL AGAIN.":OB(7) =
    44: GOTO 100: REM UNTIE
350 IF N1$ = E3$ AND OB(1) = 44 THEN OB(1) = 0:OB(8) =
    44: PRINT : PRINT "THE STATION MASTER TAKES YOUR
    BEAD AND SAYS, 'THAT WAMPUM'S WORTH ABOUT
    $1.' HE GIVES YOU A TICKET.": GOTO 100
360 IF V1$ = B8$ AND R = 34 THEN GOTO 2000: REM
    WAITING FOR TRAIN
370 IF V1$ = B8$ THEN PRINT : PRINT
    "HMMMM.....HMMMMM.....HMMMMM...":
    GOTO 100: REM GENERAL WAITING ROUTINE
380 IF R = 34 AND TR > 0 AND N1$ = D1$ THEN GOTO 2030:
    REM BOARDING TRAIN
390 PRINT : PRINT "I DON'T KNOW WHAT YOU MEAN!":
    GOTO 100
400 REM MOVING AROUND ROUTINE AND SPECIAL
    CONDITIONS
410 IF R = 8 OR R = 9 THEN GOTO 1800: REM YUCKO SAM
    GENERAL ROUTINES
420 X = R
430 IF V1$ = "NORTH" OR V1$ = "N" THEN R = N(R)
440 IF V1$ = "SOUTH" OR V1$ = "S" THEN R = S(R)
450 IF V1$ = "EAST" OR V1$ = "E" THEN R = E(R)
460 IF V1$ = "WEST" OR V1$ = "W" THEN R = W(R)
470 IF R > 0 THEN X = R: HOME : GOTO 490
480 IF R = 0 THEN PRINT : PRINT "YOU CAN'T MOVE THAT
    WAY AT THIS TIME.":R = X:X = 0: GOTO 100
490 IF WO = 1 THEN RD(R) = 0: REM RESET LONG
    DESCRIPTION
500 IF R > 25 THEN GOTO 530
510 ON R GOSUB 2510,2530,2550,2570,2590,
    2610,2630,2650,2670,2690,2700,2730,
    2750,2770,2790,2810,2820,2840,2860,
    2880,2900,2920,2940,2960,2980
520 GOTO 540
530 ON R - 25 GOSUB 3000,3020,3040,3060,3080,
    3100,3120,3140,3160,3180,3200,3220,
    3240, 3270,3290,3310,3350,3390
540 IF C1 = R OR C2 = R OR C3 = R OR C4 = R THEN PRINT :
    PRINT "THERE IS A COW HERE!": GOSUB 1500: REM
    GATHER UP COWS
550 IF OB(7) = R THEN PRINT : PRINT "THERE IS A BULL
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HERE!"
560 IF OB(7) = 44 THEN PRINT : PRINT "YOU ARE LEADING A
      BULL BY THE NOSE."
570 IF OB(7) = 44 AND CW > 0 THEN PRINT : PRINT "THE
      BULL IS FOLLOWED BY ";CW;" COWS."
580 PRINT : PRINT "OBJECTS HERE ARE:"; PRINT
590 X = R
600 REM LISTING OF OBJECTS ROUTINE
610 IF X = OB(1) THEN PRINT "AN INDIAN BEAD";Y = 1
620 IF X = OB(2) THEN PRINT "GOLD";Y = 1
630 IF X = OB(3) THEN PRINT "A CASHIER'S CHECK";Y = 1
640 IF X = OB(4) THEN PRINT "A ROPE";Y = 1
650 IF X = OB(5) THEN PRINT "AN INDIAN RING";Y = 1
660 IF X = OB(6) THEN PRINT "A MINER'S PICK";Y = 1
670 IF X = OB(8) THEN PRINT "A TRAIN TICKET";Y = 1
680 IF X = OB(9) THEN PRINT "DEAD CATTLE";Y = 1
690 IF Y = 0 THEN PRINT "NOTHING"
700 Y = 0:X = 0: GOTO 100
800 REM GET ROUTINE
810 X = 0: IF N1$ = "" THEN PRINT : PRINT "HEY, I NEED A
      NOUN!"; GOTO 900
820 GOSUB 1200: REM CHECKING NOUN VALIDITY
830 IF OB(X) = R OR OB(X) = 44 THEN GOTO 880
840 IF OB(7) = 23 THEN GOTO 870: REM BULL IS TIED UP
850 IF N1$ = C9$ THEN GOTO 1590: REM GETTING BULL
860 IF OB(5) = 45 AND OB(7) = R THEN GOTO 1660: REM
      PART OF BULL PUZZLE SOLVED
870 PRINT : PRINT "YOU CAN'T, AT THE MOMENT."; GOTO
      900
880 OB(X) = 44: REM YOU ARE IN ROOM 44; THAT IS,
      YOU'VE GOT OBJECT
890 PRINT : PRINT "OKAY, YOU'VE GOT THE ";N1$;"."
900 X = 0: GOTO 100
1100 REM DROP ROUTINE
1110 X = 0: IF N1$ = "" THEN PRINT : PRINT "HEY, I NEED A
      NOUN!"; GOTO 1160
1120 GOSUB 1200: REM CHECKING NOUN VALIDITY
1130 IF OB(X) = 44 THEN GOTO 1150
1140 PRINT: PRINT "YOU'RE NOT CARRYING THE ";N1$;".";
      GOTO 1160
1150 OB(X) = R: PRINT : PRINT "OKAY, DROPPED
      THE ";N1$;"."
1160 X = 0: GOTO 100
1200 REM SUBROUTINE TO CHECK NOUNS
1210 IF N1$ = C8$ THEN X = 1
1220 IF N1$ = D0$ THEN X = 2
1230 IF N1$ = D3$ THEN X = 3
1240 IF N1$ = D5$ THEN X = 4
1250 IF N1$ = D4$ THEN X = 5
1260 IF N1$ = D9$ THEN X = 6
1270 IF N1$ = C5$ THEN X = 9
1280 RETURN
1300 REM SETTING BULL ROUTINE
1310 IF IC = 0 THEN PRINT : PRINT "THE OLD CHIEF IS GLAD
      TO SEE YOU AND GIVES YOU A BEAUTIFUL NOSE
      RING.";OB(5) = 44:IC = 1: RETURN
1320 IF IC = 1 THEN PRINT : PRINT "THE OLD CHIEF IS
      GETTING ANGRY. 'PLEASE LEAVE, YOU'RE MUDDYING
      UP THE TENT!";IC = 2: RETURN
1330 IF IC = 2 THEN PRINT : PRINT "OH NO. THE OLD CHIEF
      HAS TURNED SURLY...HIS HAIR IS STANDING UP...HE IS
      SURLY WITH A FRINGE ON TOP. HE HAS YOU FED TO
      THE CAMP KATZ."; GOTO 3750
1400 REM DIG ROUTINE
1410 IF N1$ = D0$ AND OB(6) = 44 AND R = 22 THEN PRINT
      : PRINT "YOU'VE FOUND THE FABULOUS MCDONALD
      NUGGET. YOU ARE LUCKY INDEED. SADLY, THOUGH,
      YOU'VE DROPPED THE PICK DOWN A BOTTOMLESS
      SHAFT.";OB(6) = 0:OB(2) = 44: GOTO 1440
1420 IF OB(6) = 44 THEN PRINT : PRINT "YOU LOAD 16 TONS
      AND WHAT DO YOU GET, ANOTHER DAY OLDER AND
      COVERED WITH SWEAT."; GOTO 1440
1430 PRINT : PRINT "YOU'VE NOTHING TO DIG IT WITH!";
      GOTO 1440
1440 GOTO 100
1500 REM COW AND BULL SUBROUTINE
1510 IF C1 = R AND OB(7) = 44 THEN C1 = 0: CW = CW + 1:
      GOTO 1560
1520 IF C2 = R AND OB(7) = 44 THEN C2 = 0: CW = CW + 1:
      GOTO 1560
1530 IF C3 = R AND OB(7) = 44 THEN C3 = 0: CW = CW + 1:
      GOTO 1560
1540 IF C4 = R AND OB(7) = 44 THEN C4 = 0: CW = CW + 1:
      GOTO 1560
1550 GOTO 1570
1560 PRINT "THE COW BLUSHES MODESTLY, SMILES, AND
      FOLLOWS THE BULL."
1570 RETURN
1580 IF OB(7) = 44 THEN PRINT : PRINT "YOU'VE GOT THE
      BULL!"; RETURN
1590 IF OB(7) = R THEN GOTO 1610: REM THE BULL IS HERE
1600 PRINT : PRINT "HE ISN'T HERE YET."; RETURN
1610 Q1 = 1: PRINT : PRINT "OKAY, BUT WITH WHAT OR
      HOW?"; GOTO 900: REM Q1 FLAG SAYS BULL
      ROUTINE IN PROGRESS
1620 IF OB(5) = 45 THEN GOTO 1670: REM FIRST PART OF
      BULL PUZZLE SOLVED
1630 IF N1$ = D4$ AND OB(5) = 44 THEN OB(5) = 45: GOTO
      1660
1640 IF V1$ = D4$ AND OB(5) = 44 THEN OB(5) = 45: GOTO
      1660
1650 PRINT : PRINT "THAT WON'T WORK. TRY RINGING
      THE BULL'S CHIMES."; GOTO 100
1660 PRINT : PRINT "THE BULL ADMIRES THE LOVELY RING
      AND ALLOWS YOU TO FASTEN IT TO HIS NOSE.";
      GOTO 100
1670 IF N1$ = D5$ AND OB(4) = 44 THEN OB(4) = 45: GOTO
      1700
1680 IF V1$ = D5$ AND OB(4) = 44 THEN OB(4) = 45: GOTO
      1700
1690 PRINT : PRINT "A GOOD TRY, BUT TO WIN THE BATTLE
      WITH THE CATTLE YOU'VE GOT NO HOPE WITHOUT A
      ROPE."; GOTO 100
1700 PRINT : PRINT "YOU TIE THE ROPE TO THE BULL'S
      NOSE RING AND HE ALLOWS HIMSELF TO BE LED
      AROUND BY THE NOSE.";OB(7) = 44: GOTO 100
1800 REM YUCKO SAM
1810 IF YS = 1 THEN GOTO 420
1820 IF V1$ = "S" OR V1$ = "SOUTH" THEN GOTO 1840
1830 GOTO 420
1840 IF R = 8 AND OB(7) = 44 THEN GOTO 1860: REM
      TRYING TO CROSS WITH BULL
1850 IF R = 9 AND OB(7) <> 44 THEN GOTO 420: REM
      TRYING TO CROSS TOLL
1860 PRINT : PRINT "ROOTIN' TOOTIN' YUCKO SAM
      APPEARS AND SAYS: 'PARD, THAT'LL COST YOU SOME
      DINERO TO CROSS.';Q2 = 1: GOTO 100: REM Q2 IS
      PAYOFF ROUTINE FLAG
1870 IF OB(2) = 44 THEN GOTO 1890
1880 IF V1$ = D0$ OR N1$ = D0$ THEN PRINT : PRINT "YOU
      DON'T HAVE IT YET."; GOTO 100
1890 IF V1$ = D0$ OR N1$ = D0$ THEN PRINT : PRINT
      "YUCKO SAM STEPS ASIDE AND DOFFS HIS
      SOMBRERO TO LET YOU PASS.";OB(2) = 0:YS = 1:
      GOTO 100
1900 PRINT : PRINT "YUCKO SEZ, 'DON'T GIMME NO GUFF.
      WHAT I CRAVES IS GOLD.'"; GOTO 100
2000 REM TRAIN ROUTINE

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2010 IF TR > 2 THEN PRINT : PRINT "CHOO CHUG": GOTO
100: REM STUCK FOREVER
2020 PRINT : PRINT "A SMOKY, PUFFING OLD TRAIN PULLS
INTO THE STATION.":TR = TR + 1: GOTO 100: REM
TRAIN COUNTER RUNNING
2030 IF OB(8) = 44 THEN HOME : PRINT "YOU BOARD THE
TRAIN AND THE CONDUCTOR TAKES YOUR
TICKET.":OB(8) = 0: PRINT : GOTO 2050
2040 PRINT : PRINT "NO TICKEE, NO TRAINEE.": GOTO 100
2050 IF TR = 1 AND OB(7) = 44 THEN OB(7) = 0: CW = 0:
PRINT : PRINT "THE TRAIN PULLS OUT OF THE
STATION AND AS YOU LOOK OUT THE WINDOW
YOU SEE YOUR HERD WAVING GOODBYE FROM THE
PLATFORM.":R = 39: GOTO 100
2060 IF OB(7) <> 44 AND TR = 1 THEN PRINT : PRINT "THE
TRAIN PULLS OUT OF THE STATION AND YOU ARE IN
ST. LOUIS IN A JIFFY.":R = 39: GOTO 100
2070 IF TR = 2 AND OB(7) = 44 THEN OB(7) = 0: CW = 0:
PRINT : PRINT "YOU MOMENTARILY STEP OFF THE
TRAIN TO BUY A PAPER, AND AS YOU LOOK BACK
YOU SEE YOUR COWS WAVING BYE-BYE FROM THE
CATTLE CAR PULLING OUT.": GOTO 100
2080 IF OB(7) <> 44 THEN PRINT : PRINT "YOU
MOMENTARILY STEP OFF THE TRAIN TO BUY A PAPER,
AND AS YOU LOOK BACK YOU SEE THE TRAIN
PULLING OUT WITHOUT YOU.": GOTO 100
2090 R = 35: GOTO 530
2100 REM TRAIN STOP
2110 CL = CL + 1: REM CLOCK IS RUNNING
2120 IF CL = 8 AND R = 35 AND WC = 1 THEN Q3 = 0: PRINT
: PRINT "YOU ARRIVE IN ST. LOUIS WITH A HAPPY
HERD OF CATTLE.":R = 39: GOTO 530
2130 IF CL = 8 AND R = 35 THEN Q3 = 0: PRINT : PRINT
"YOU ARRIVE IN ST. LOUIS BUT YOUR HERD HAS
PERISHED FROM THIRST.":R = 39: OB(7) = 0: CW =
0: OB(9) = 44: GOTO 530
2140 IF CL = 8 THEN S(36) = 0: Q3 = 0: PRINT : PRINT "OH
NO—THE TRAIN HAS LEFT WITHOUT YOU AND THAT
WAS THE VERY LAST TRAIN...EVER TO STOP AT YUCKO
FLATS!!!": GOTO 100
2150 GOTO 230
2200 REM STOCKYARD ROUTINE
2210 IF OB(9) = 44 THEN PRINT : PRINT "OL' YUCKO SAM
APPEARS AND PUNCHES YOU IN THE EYE. 'GET THEM
VARMINTS OUTTA HYAR AFORE I VENTILATES
YA!!!": RETURN
2220 MO = 100 + (CW * 100): REM AMOUNT OF MONEY
CALCULATION
2230 PRINT : PRINT "OL' YUCKO SAM APPEARS AND
INSPECTS YOUR HERD. 'THEM THAR'S MIGHTY FINE
BEEVES. HYARS A CHECK FOR ";MO;" BUCKS, PARD.
THANKEE KINDLEE.' HE LEADS YOUR HERD
AWAY.": OB(7) = 0: CW = 0: OB(3) = 44: RETURN
2500 REM ROOM DESCRIPTION SUBROUTINES
2510 PRINT "YOU'RE ON THE BUY-A PENINSULA.": IF RD(R)
= 1 THEN RETURN
2520 PRINT : PRINT "IT IS THE YEAR 1887 AND YOU ARE AN
OLD COWHAND MAKING A MEAGER LIVING
PUNCHING CATTLE. THIS IS THE ANNUAL ROUNDUP
IN OLD MEXICO TO CAPTURE A WILD HERD FOR SALE
IN OLD ST. LOUIS.": RD(R) = 1: RETURN
2530 PRINT "YOU'RE HOME ON THE RANGE.": IF RD(R) = 1
THEN RETURN
2540 PRINT : PRINT "HOME, HOME ON THE RANGE,":
PRINT "WHERE THE DEER AND THE ANTELOPE PLAY,":
PRINT "WHERE SELDOM IS HEARD, A DISCOURAGING
WORD,": PRINT "FOR WHAT CAN AN ANTELOPE
SAY?": RD(R) = 1: RETURN
2550 PRINT "YOU'RE IN AN ADOBE HACIENDA.": IF RD(R) =
1 THEN RETURN
2560 PRINT : PRINT "YOU HAVE JUST ENTERED THE WEST
ENTRANCE OF MY ADOBE HACIENDA. THERE IS AN
ENTRANCE (OR EXIT) TO THE EAST.": RD(R) = 1:
RETURN
2570 PRINT "YOU'RE IN THE HACIENDA'S CORRAL.": IF
RD(R) = 1 THEN RETURN
2580 PRINT : PRINT "PLEASE WATCH WHERE YOU STEP
HERE. IF NOT, THERE IS A STRONG POSSIBILITY OF
YOU TRACKING UP THE REST OF THE GAME.": RD(R) =
1: RETURN
2590 PRINT "YOU'RE ON A HIGH BLUFF.": IF RD(R) = 1
THEN RETURN
2600 PRINT : PRINT "TO THE EAST IS AN IMPASSIBLE RANGE
OF MOUNTAINS, THE SIERRA PADRES. FAR BELOW IS
THE RIO YUCKO, SLOWLY MEANDERING ON ITS
ENDLESS QUEST FOR THE SEA (POETIC, EH?).": RD(R) =
1: RETURN
2610 PRINT "YOU'RE ON A LOW BLUFF.": IF RD(R) = 1 THEN
RETURN
2620 PRINT : PRINT "TO THE EAST IS A HIGH BLUFF. TO THE
WEST IS A NARROW FISSURE WITH THE FIGURE OF A
KING CARVED NEXT TO IT ALONG WITH THE WORDS,
'BOBBY WAS HERE.": RD(R) = 1: RETURN
2630 PRINT "YOU'RE IN POOR BOX CANYON.": IF RD(R) = 1
THEN RETURN
2640 PRINT : PRINT "THIS IS A VERY POOR BOX CANYON AS
IT HAS SEVERAL EXITS. . . A FISSURE TO THE EAST, AN
ENTRANCE TO THE WEST, AND ANOTHER EXIT TO THE
NORTH. YOU MAY WANT TO MAKE A SMALL
DONATION TO SAVE THE CANYON.": RD(R) = 1:
RETURN
2650 PRINT "YOU'RE AT A FJORD.": IF RD(R) = 1 THEN
RETURN
2660 PRINT : PRINT "TO THE SOUTH IS THE RIO YUCKO
RIVER. THERE IS A RESTROOM HERE. . . THIS IS A JOHN
FORD.": PRINT "A CRUDELY LETTERED SIGN READS:
'CATTLE ARE FREE, FOR PEEPLE A FEE.": RD(R) = 1:
RETURN
2670 PRINT "YOU'RE AT A SHALLOW FJORD.": IF RD(R) = 1
THEN RETURN
2680 PRINT : PRINT "TO THE SOUTH IS THE RIO YUCKO
RIVER. A CRUDELY SCRAWLED SIGN HERE READS:
'PEEPLA ARE FREE, FOR CATTLE A FEE.": RD(R) = 1:
RETURN
2690 PRINT "YOU'RE IN THE ROLLING HILLS.": RETURN
2700 PRINT "YOU'RE IN THE DARK HILLS.": IF RD(R) = 1
THEN RETURN
2710 PRINT : PRINT "TO THE WEST IS A GLOOMY, DARK
ENCHANTED LAND WHERE THE FORCES OF EVIL ARE
GATHERING TO DESTROY CIVILIZATION. ONLY YOU
CAN SAVE THE WORLD, BUT THAT HAS NOTHING TO
DO WITH THIS ADVENTURE AS YOU CAN'T GO WEST."
RD(R) = 1: RETURN
2720 RD(R) = 1: RETURN
2730 PRINT "YOU'RE IN AN ARROYO.": IF RD(R) = 1 THEN
RETURN
2740 PRINT : PRINT "THERE IS VERY TASTY, MUNCHY GRASS
GROWING HERE.": RD(R) = 1: RETURN
2750 PRINT "YOU'RE IN THE PLAZA DE TOROS.": IF RD(R) =
1 THEN RETURN
2760 PRINT : PRINT "THIS BULLFIGHTING ARENA IS
OVERGROWN WITH WEEDS AND HAS BEEN LONG
ABANDONED. THE BRIGHT COLORS OF THE WOODEN
SEATS HAVE FADED.": RD(R) = 1: RETURN
2770 PRINT "YOU'RE IN AN ARROYO.": IF RD(R) = 1 THEN
RETURN
2780 PRINT : PRINT "THERE IS LOCOWEED GROWING
HERE.": RD(R) = 1: RETURN
2790 PRINT "YOU'RE AT THE MINE ENTRANCE.": IF RD(R) =

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1 THEN RETURN
2800 PRINT : PRINT "THIS IS THE LOST SCOTCHMAN MINE.
HIS NAME WAS MAC. . .SOMETHING OR
MC. . .SOMETHING.":RD(R) = 1: RETURN
2810 PRINT "YOU'RE IN THE BADLANDS.": RETURN
2820 PRINT "YOU'RE IN THE BADLANDS.": IF RD(R) = 1
THEN RETURN
2830 PRINT : PRINT "A WELL-WORN ROAD TO THE SOUTH
LEADS TO THE RAILHEAD AT ABILENE.":RD(R) = 1:
RETURN
2840 PRINT "YOU'RE IN THE BADLANDS.": IF RD(R) = 1
THEN RETURN
2850 PRINT : PRINT "A WELL-WORN ROAD TO THE SOUTH
LEADS TO THE RAILHEAD AT ABILENE. BE CAREFUL, AS
THERE IS LOCOWEED GROWING HERE.":RD(R) = 1:
RETURN
2860 PRINT "YOU'RE IN THE BADLANDS.": IF RD(R) = 1
THEN RETURN
2870 PRINT : PRINT "THE SUN BEATS DOWN ON YOUR
HEAD AS YOU EXPLORE THIS WILD FORSAKEN
LAND.":RD(R) = 1: RETURN
2880 PRINT "YOU'RE IN THE BADLANDS."
2890 PRINT : PRINT "THE WIND HOWLS AND A WILD
STORM RAGES AROUND YOU. YET, YOU STRUGGLE
ON. . .": RETURN
2900 PRINT "YOU'RE IN THE GOODLANDS.": IF RD(R) = 1
THEN RETURN
2910 PRINT : PRINT "THIS IS A SPOT RIFE WITH GREEN
GRASS AND LOVELY WEATHER.": PRINT : PRINT
"THESE ARE WATERHOLES HERE.":RD(R) = 1: RETURN
2920 PRINT "YOU ARE IN THE LOST SCOTCHMAN MINE.":
IF RD(R) = 1 THEN RETURN
2930 PRINT : PRINT "THIS IS A SMALL MINE AND IS LIT BY
LIGHT STREAMING IN THROUGH THE ENTRANCE. THE
LIGHT GLINTS OFF PARTICLES OF FOOL'S GOLD
EMBEDDED IN THE WALLS.":RD(R) = 1: RETURN
2940 PRINT "YOU'RE AT THE RAILHEAD IN ABILENE. THERE'S
A HITCHING POST HERE.": IF RD(R) = 1 THEN RETURN
2950 PRINT : PRINT "ABILENE HAS NOTHING TO OFFER
EXCEPT A TRAIN STATION WHERE THE TRAINS TO ST.
LOUIS COME THROUGH SEVERAL TIMES A DAY.":RD(R)
= 1: RETURN
2960 PRINT "YOU ARE IN THE BADLANDS.": RETURN
2970 REM
2980 PRINT "YOU ARE IN THE BADLANDS.": IF RD(R) = 1
THEN RETURN
2990 PRINT : PRINT "THERE IS A WATERHOLE HERE.
SOMEONE HAS SCRAWLED ON A SIGN": PRINT :
PRINT "DANGER. . .THIS HERE WATERHOLE'S
PIZEN!" :RD(R) = 1: RETURN : REM IT REALLY ISN'T
BUT YOU COULD PUT ONE HERE
3000 PRINT "YOU'RE IN SITTING BULL'S TEEPEE.": GOSUB
1300
3010 RETURN
3020 PRINT "YOU'RE IN AN INDIAN VILLAGE.": RETURN
3030 REM
3040 PRINT "YOU'RE IN AN INDIAN VILLAGE.": IF RD(R) = 1
THEN RETURN
3050 PRINT : PRINT "SEVERAL INDIANS ARE DISCUSSING
STARTING A TRADING POST. THEY IGNORE YOU AS
THEY ARE WORKING UP A PRO FORMA USING A
VISICALC MODEL.":RD(R) = 1: RETURN
3060 PRINT "YOU'RE AT THE ENTRANCE OF A TEPEE.":
RETURN
3070 REM
3080 PRINT "YOU'RE IN AN INDIAN VILLAGE.": IF RD(R) = 1
THEN RETURN
3090 PRINT : PRINT "SEVERAL INDIANS ARE ARGUING OVER
THE RELATIVE MERITS OF THE FLIGHT

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CHARACTERISTICS OF ARROWS FEATHERED WITH THE
AFRICAN SWALLOW'S VS. THE EUROPEAN SWALLOW'S
FEATHERS. THEY IGNORE YOU.":RD(R) = 1: RETURN
3100 PRINT "YOU'RE IN A SMALL DESERT.": IF RD(R) = 1
THEN RETURN
3110 PRINT : PRINT "IT IS VERY HOT AND DRY HERE.":RD(R)
= 1: RETURN
3120 PRINT "YOU'RE IN A SMALL DESERT.": IF RD(R) = 1
THEN RETURN
3130 PRINT : PRINT "IT IS VERY HOT AND DRY HERE.":RD(R)
= 1: RETURN
3140 PRINT "YOU'RE IN THE TRAIN STATION.": IF OB(7) = 44
THEN GOTO 3710
3150 PRINT : PRINT "A SIGN HERE READS: ": PRINT
"TICKETS TO ST. LOUIS, $1.": PRINT "NO SMOKING.
NO CATTLE ALLOWED IN STATION.": RETURN
3160 PRINT "YOU'RE ON THE TRAIN PLATFORM."
3170 PRINT : PRINT "A SIGN SAYS: ": PRINT "WAIT HERE
FOR TRAINS.": RETURN
3180 PRINT "YOU'RE AT A TRAIN STOP.":Q3 = 1: REM Q3
FLAG STARTS TRAIN STOP ROUTINE
3190 PRINT : PRINT "THE CONDUCTOR SAYS.": PRINT :
PRINT "THERE'LL BE A BRIEF STOP. IF YOU LEAVE THE
TRAIN, BE SURE TO BE BACK IN EIGHT MINUTES.
OTHERWISE, JUST WAIT.": RETURN
3200 PRINT "YOU'RE IN A DRY STREAM BED.": RETURN
3210 REM
3220 PRINT "YOU'RE IN A DRY STREAM BED.": RETURN
3230 REM
3240 PRINT "YOU'RE AT A MUD HOLE.": IF RD(R) = 1 THEN
RETURN
3250 PRINT : PRINT "THERE IS A LITTLE WATER AT THE
BOTTOM OF THE MUD HOLE, BUT YOU CAN SEE THE
BONES OF CATTLE WHO HAVE BEEN MIRED HERE AND
ARE UNABLE TO GET OUT.": IF WC = 0 AND OB(7)
= 44 THEN PRINT "YOUR CATTLE SLURP UP SOME
WATER.":WC = 1
3260 RD(R) = 1: RETURN
3270 PRINT "YOU'RE IN OLD ST. LOUIS.": IF RD(R) = 1 THEN
RETURN
3280 PRINT : PRINT "YOU'VE MADE IT TO ST. LOUIS, CATTLE
CENTER OF THE COUNTRY.":RD(R) = 1: RETURN
3290 PRINT "YOU'RE ON THE MAIN STREET.": !F RD(R) = 1
THEN RETURN
3300 PRINT : PRINT "OLD ST. LOUIS IS A TOWN OF MONEY,
CATTLE, AND LOOSE WOMEN, NOT NECESSARILY IN
THAT ORDER. REMEMBER WHAT YOU PROMISED
YOUR DEAR OLD MOM.":RD(R) = 1: RETURN
3310 PRINT "YOU'RE AT THE STOCKYARDS."
3320 PRINT : PRINT "A SIGN HERE SAYS, 'WE BUYSES
COWSES.": IF OB(7) = 44 THEN GOSUB 2200: REM
COW SELLING ROUTINE
3330 IF OB(9) = 44 THEN GOSUB 2200: REM TRYING TO SELL
DEAD COWS
3340 RETURN
3350 PRINT "YOU'RE IN A BANK."
3360 IF OB(3) = 44 THEN POP : GOTO 3730
3370 PRINT : PRINT "A SIGN HERE READS: ": PRINT : PRINT
"NO CATTLE ALLOWED.": IF OB(7) = 44 OR OB(9) = 44
THEN POP : GOTO 3710
3380 RETURN
3390 PRINT "YOU'RE IN A DANCE HALL."
3400 PRINT : PRINT "A SIGN HERE READS: ": PRINT : PRINT
"NO CATTLE ALLOWED.": IF OB(7) = 44 OR OB(9) = 44
THEN POP : GOTO 3710
3410 IF OB(3) = 44 THEN POP : GOTO 3720
3420 RETURN
3500 REM ROOM DATA STATEMENTS
3510 DATA 0,8,2,14,0,7,3,1,0,6,4,2,0,5,0,3,4,0,0,6,3,0,5,7,2,0,6,8,

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1,18,7,9,14,17,8,10,0,0,9,11,12,0,10,
0,0,11,13,0,0,0,14,12,0,9,1,13,0,22,16
0,0,0,17,15
3520 DATA 9,23,18,16,8,23,19,17,7,24,20,18,0,0,21,19,
0,0,0,20,15,0,0,0,18,33,0,17,19,34,25,0,0,0,0,
24,0,29,0,0,0,30,28,0,0,31,0,27,26,0,30,0,
27,0,31,29,28,0,32,30
3530 DATA 0,0,33,31,23,34,0,32,33,0,0,0,36,0,0,0,0,35,
37,0,0,0,38,36,0,0,0,37,0,40,0,0,43,42,39,
41,0,0,40,0,40,0,0,0,0,40,0,0
3600 REM VOCABULARY
3610 DATA "GET","TAKE","CATCH","DROP","TIE",
"PUNCH","HIT","EAT","DRINK","GIVE","PAY",
"INVENTORY","I","INV","DANCE","KILL","DIG",
"Mine","WAIT","QUIT","SAVE","JUMP","RIDE",
"CASH","COW","CATTLE","HERD","INDIAN",
"BEAD","BULL","GOLD","TRAIN"
3620 DATA "MONEY","CHECK","RING","ROPE","WATER",
"POISON","PIZEN","PICK","WORDY","TERSE",
"UNTIE","TICKET"
3700 REM END OF GAME ROUTINES
3710 PRINT : PRINT "THE TOWNSFOLK ARE INCENSED THAT
YOUR CATTLE MUDDIED UP THE PLACE AND, AFTER
TARRING AND FEATHERING YOU, HANG YOU UP TO
DRY ON A TREE. .BY THE NECK!!!": GOTO 3750
3720 PRINT : PRINT "THE DANCE HALL PATRONS ARE GLAD
TO SEE YOU. AFTER SEVERAL HOURS OF DRINKING
AND GAMBLING, YOU NOTICE YOU HAVE BEEN
THROWN OUT ON THE STREET AND OUT OF THE
GAME.": GOTO 3750
3730 IF MO = 500 THEN PRINT : PRINT "HOORAY. YOU'VE
GOT ENOUGH MONEY TO PAY OFF THE MORTGAGE,
MARRY YOUR SWEETHEART, BUY A MERCEDES, AND
SEND YOUR KIDS TO COMPUTER SCHOOL. YOU'VE
WON.": GOTO 3760
3740 PRINT : PRINT "OL' YUCKO SAM TAKES YOUR CHECK
AND SEZ, 'IT AIN'T QUITE ENUF, SO I'SE GONNA
FORECLOSE YOUR MORTGAGE, MARRY YOUR
SWEETHEART, BUY A MERCEDES, AND SEND MYSELF
TO COMPUTER SCHOOL.'": PRINT
3750 PRINT : PRINT "DO YOU WANT TO PLAY AGAIN? ";;
INPUT "";;A$: IF A$ = "YES" THEN CLEAR : GOTO 20
3760 END
4000 REM ROUTINE TO QUIT
4010 PRINT : PRINT "DO YOU WANT TO SAVE THIS
GAME?"; INPUT "";;A$: IF A$ = "YES" THEN SG = 1:
GOTO 4500
4020 HOME : VTAB 10: PRINT "YUCKO SAM SEZ, 'SO LONG,
PARD.'"
4030 END
4500 REM ROUTINE TO SAVE GAME. THE IMPORTANT
THING IS FOR YOU TO LOAD THE VARIABLES SHOWN
BELOW. THE TECHNIQUE IS FOR THE APPLE
COMPUTER AND WILL BE DIFFERENT FOR EACH
COMPUTER.
4510 D$ = CHR$(4): REM FOR APPLE USE
4520 PRINT D$;"OPEN HIDEFILE"
4530 PRINT D$;"WRITE HIDEFILE"
4540 PRINT C1: PRINT C2: PRINT C3: PRINT C4: PRINT CL:
PRINT CW: PRINT IC: PRINT MO: PRINT OB(1): PRINT
OB(2): PRINT OB(3): PRINT OB(4): PRINT OB(5): PRINT
OB(6): PRINT OB(7): PRINT OB(8): PRINT OB(9): PRINT
Q1: PRINT Q2: PRINT Q3: PRINT R: PRINT TR: PRINT
WC: PRINT WO: PRINT YS
4550 PRINT D$;"CLOSE"
4560 REM LINE 4540 CONTAINS THE VARIABLE TO BE
RELOADED
4570 PRINT D$: IF SG = 1 THEN GOTO 4020
4580 GOTO 100

```

```

5000 REM ROUTINE TO LOAD SAVED GAME. THE
IMPORTANT THING IS FOR YOU TO LOAD THE
VARIABLES SHOWN BELOW. THE TECHNIQUE IS FOR
THE APPLE COMPUTER AND WILL BE DIFFERENT FOR
EACH COMPUTER.
5010 D$ = CHR$(4): REM FOR APPLE USE
5020 PRINT D$;"OPEN HIDEFILE"
5030 PRINT D$;"READ HIDEFILE"
5040 INPUT C1,C2,C3,C4,CL,CW,IC,MO,
OB(1),OB(2),OB(3),OB(4),OB(5),OB(6),
OB(7),OB(8),OB(9),Q1,Q2,Q3,R,TR,
WC,WO,YS
5050 PRINT D$;"CLOSE"
5060 REM LINE 5040 CONTAINS THE VARIABLES TO BE
RELOADED
5070 PRINT D$: GOTO 400

```

SL

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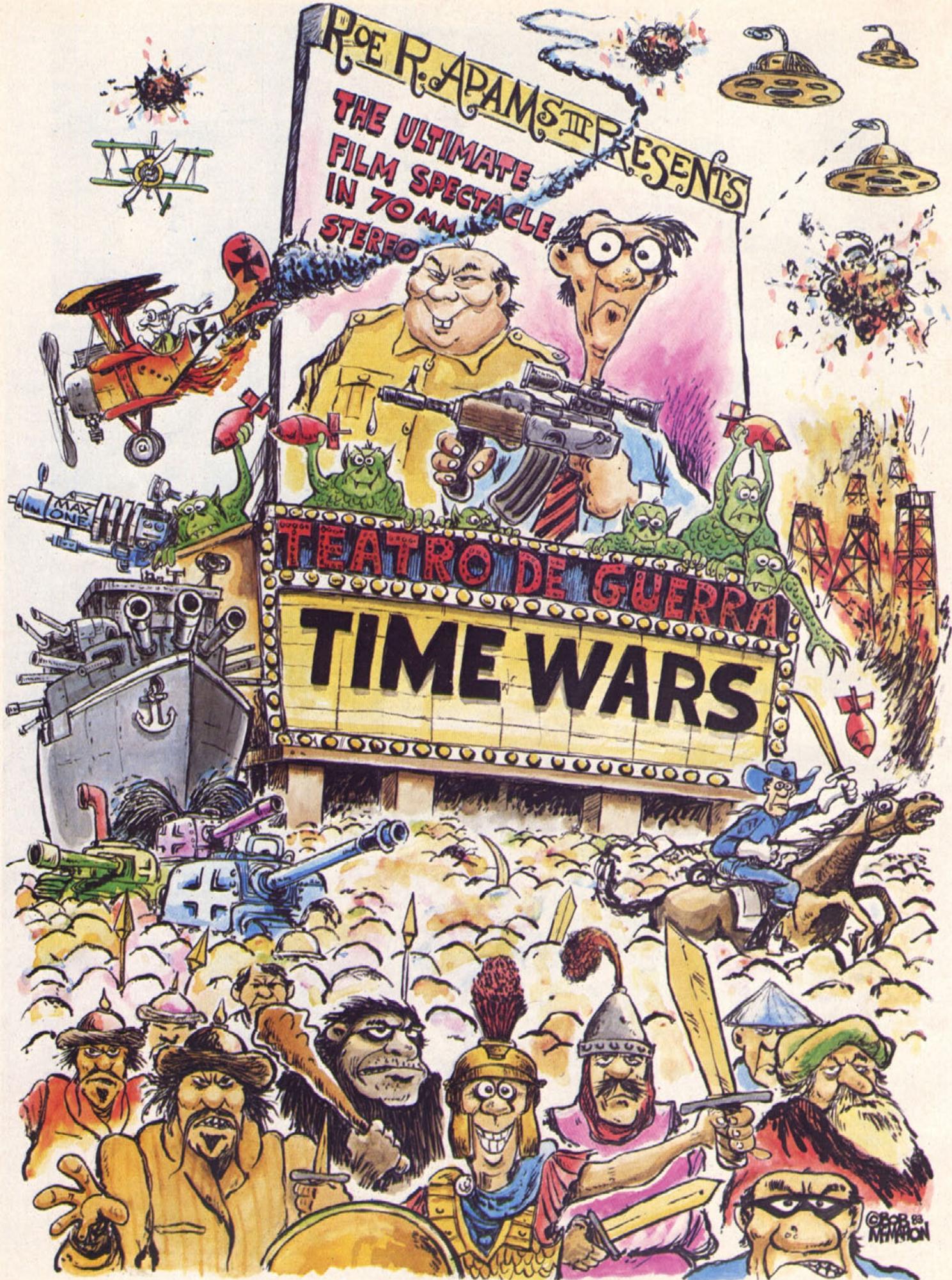
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A Foray through the Mind of a War Gamer

The plains of Gaul are hot and dry in the summer sun. The armies of Julius Caesar march against the barbarian hordes. The shining glint of the centurions' armor fills Barius's heart with pride, for they are his troops, handpicked and fiercely loyal. In the distance the Goths prepare to attack.

Forming the troops into impenetrable square formations, he seizes and holds the high ground. Now the Goths have to come to him. The barbarians, in one long line, charge with wild horns blaring. They hit the Roman squares at full speed—and bounce! The squares hold.

Roman archers rain arrows among the disorganized survivors, and the cavalry sweeps out and crushes them. The empire expands!

* * *

As the monitor cleared, Barrington sat in front of his computer, deep in thought. His mental reentry to the present time required several minutes of orientation. The Gaul campaign was a challenge to command, but now he could relax for a moment from the effort of waging war across time. Barrington thought back many years to the beginning of man's first Time War.

The Time War started in the year 2167, when the enemy was unable to defeat Earth's regular forces in open combat. The infamous Pan-Asian warlord, Weng Chow, had seemed on the verge of oblivion. Then the unthinkable occurred. One of the scientists, assigned to a top-secret project, sold out to Weng Chow. With that renegade went the newly discovered secret of time travel. Weng Chow immediately realized that if he could change past history he could win in the future. The major battles throughout history held the key. Each battle was a nexus of historic flux. The altering of the outcome would have a ripple effect across the centuries. As the amount of energy needed for the fifth-dimensional rotation was so great, each side could afford to send only one man. As Weng Chow was the aggressor, he usually chose the arena of war, forcing Earth's champion to do battle on Weng Chow's terms. Upon arriving at the battlefield, each person would assume command of one side of the battle and try to alter the historic results.

The task of combating Weng Chow lay with Barrington. The Supreme Allied Commander of the Earth's Time Defenses, Barrington looked like any other tired executive home from a hard day at the office. But, while other executives sought relaxation after dinner with the family, for Barrington, the energizing of his computer began the most exciting part of the day. He immediately began to match wits and strategy with a relentless adversary. Linked directly to the master war room at Time Base Omega, Barrington's mind would either jump back into the middle of an existing battle or marshal its forces for a new theater of war. As a long-time student of military history, Barrington was deeply versed in the subtleties of the art of war. The strategies of the millennia were his to draw upon. However, the enemy was ruthless and cunning. One crucial slip this day and mankind may never exist.

Journey now with Barrington's mind as it travels throughout time, battling Weng Chow in a kaleidoscope of battle arenas.

* * *

The time is May 1941. As commander of the British task force in the North Sea, the sinking of the elusive *Bismarck* is utmost in your mind. If the *Bismarck* escapes, Allied shipping will be devastated. Looking at the large grid map, the mighty British task force looks small against the vastness of ocean. Something other than a standard search pattern seems to be needed. The *Bismarck* has evaded every previous attempt to locate it. Perhaps a football-style "down-and-out" pattern will surprise the *Bismarck*. Orders are given, and the task force scatters to begin the sweeps. For a long time, nothing is heard or seen. Large fog banks make visibility poor. Then a quick, short message from the cruiser *Suffolk*: "*Bismarck* sighted, grid 19x17." Quickly the sailing order is given for the *Suffolk* to move out of danger, but the *Bismarck*'s huge fifteen-inch guns instantly zero in on the *Suffolk*. Three rounds are fired, and the *Suffolk* sinks. Her nearby sister ship, *Norfolk*, closes with the *Bismarck* and tries

to shadow the giant ship until the big battlewagons can be mustered. Despite the *Bismarck*'s twisting and turning the *Norfolk* holds on like a terrier with a bone. Damages suffered from air strikes launched from the carrier *Ark Royal* are beginning to slow down the German behemoth. Around midnight, after a long ship-to-ship artillery duel, the unsinkable *Bismarck* is finally sunk.

* * *

As Barrington surfaced from the link to Time Base Omega, the thrill of victory was somewhat tempered by the severe losses his British forces suffered. The excitement of the final confrontation made him overeager. Due to haste, two more fine ships of the line were lost with all hands, including the pride of the British Navy, the *Hood*. The lessons of history are learned from the bitter results of failures. Still, the operation was successful. The North Atlantic Theater was secure.

But Weng Chow was not so easily overcome; as the next time-jump hot spot, he chose an aerial battle in World War I, 1917.

* * *

Your hand pulls back hard on the joystick, and the Sopwith Camel rapidly climbs steeply. A German Fokker DR I flashes across the windscreen. A quick burst is fired from the twin Webley-Vickers machine guns, but you miss him. Where did he go? Frantically, you bank right. Nothing. You climb up to the ceiling and look around. Still nothing. Perhaps that cloud might provide some cover. It did—for them. As your plane emerges from the cloud, the enemy planes are waiting. Hopelessly outnumbered, you hear the stitching of bullets across the fuselage getting ever closer. . . . DISCONNECT.

* * *

Back at Time Base Omega, Barrington reeled in his chair. The death shock of the body he was controlling struck him to the core of his being. This was one of the costs of failure. Shaking off these effects, Barrington plunged right into the time stream, choosing to return to W.W.II—this time pitting Germany against the Russians.

* * *

The snows of winter seem very distant in the summer of 1942. With the power of a mighty mechanized modern army at your disposal, the task of defeating the formidable but poorly equipped Russian Bear seems easy. Using a two-pronged attack, the enemy forces are quickly split and isolated. As they drive deep into Russia, speed is the Germans' greatest asset. As your army pushes the defenders back, you send the elite SS Panzer Divisions on a quick sweep to the Russians' flank. Caught in a devastating crossfire, the large enemy force is annihilated. Victory is close, yet the Russians still throw in massive reserves of ill-equipped raw troops. This one can now be turned over to a subcommander to wrap up.

Wonder where—and in what way—Weng Chow will strike next?

* * *

With a mixed crew of Dulbians, Koraci, and Zorcons, the exploration of a neo-Kali temple should prove rewarding. All of the men are seasoned veterans of many street fights and minor adventures. While this is your first major adventure for the Guild, you feel confident in the talents of the team. A small force of night stalkers is waiting at the entrance to the temple. A quick tussle and Fred the Koraci's skill with a heavy disrupter paves the way to victory. No treasure can be found. The only exit is west, and there is a complex burglarproof lock on the door. The lock requires a fourteenth-level skill at lock picking to open it. The Zorcon, Beetlebaum, takes up the challenge, even though Beetlebaum has only a level-twelve rating. Working carefully, Beetlebaum opens the lock! That will certainly mean a raise in level for the Zorcon. The seven Gorgia natives, on the other side of the door, solicit a bribe, which you are happy to pay. The next chamber is the main altar, and it's filled with missile-throwing Mutants. Quickly deploying the team, you take cover behind a stone column. Surprise is on your side, so you make a quick run and lob a missile into their midst. What a shot! Two of the Mutants are killed, and the third is badly wounded. That tips the scales. Your team wins, but Karem, the Dulbian, will travel the stars no

more. A distant lucky shot from a phasor rifle across the room got him. A thorough search of the room yields a rare K artifact, a K transporter, and an exit door. Success, and you are home!

* * *

Catching his breath, Barrington studied the time maps to find Weng Chow already retaliating, spurning the powerful later weapons for an ancient battle of sailing ships.

* * *

The smell of the sea fills your nostrils as you stand on the deck of the three-masted frigate. The enemy is sighted almost immediately, and you order the ship brought across the wind. Careful tacking brings the two ships into range. Full broadsides are exchanged. The ten cannons on your port side slam into the enemy's hull and sails. A cheer goes up from the men, as three of the enemy's starboard cannons have been knocked out. The enemy ship now appears to be maneuvering sluggishly. Perhaps the damage was more extensive than you thought. After all, you lead a highly trained crew that's capable of great accuracy. Sensing that a quick strike might end the battle, you slowly swing the starboard cannons around to bear on the floundering ship. Suddenly, the enemy comes to life and, at full speed, charges straight at your side. The enemy ship's narrow profile makes your shots ineffective. There is no time for maneuvering. The whole ship shudders as the enemy rams. Pulling back from your stricken ship, the other ship gets off two fast salvos. The powder magazine is hit! . . . DISCONNECT.

* * *

Before Barrington could recover fully, Weng Chow pushed his advantage into the snows of Belgium. But Barrington was not to be easily dismissed in a tank battle.

* * *

Ever stare down the muzzle of a Panzer tank? What do you do when whole divisions come crashing through the woods in deep snow? Retreating and regrouping seems like a good idea, but someone has to hold the key bridges and towns as long as possible. Poor guys. Well, at least you are safe with your command in the quiet Flemish village of Bastogne.

What is that distant rumbling? *Good lord, where did all those tanks come from?* Quick men, deploy. We have to hold them at all costs. Reinforcements are on their way. Nice shot. Watch your flank! Captain, get those reserves over to cover that hole in the lines, pronto. This is not going to be a good Christmas this year.

Somehow you hold that village for three weeks, and that is time enough. The Battle of the Bulge is won.

* * *

Backward in time again went Weng Chow, skillfully aiming at the war that gave Barrington the most dis-ease: the Civil War.

* * *

The gray twilight of the dawn matches our uniforms perfectly as we march along the road. Strange, no word has been received from some of the forward pickets in quite a while. They probably fell asleep last night. You wonder if you should send out some more scouts, but that will leave less men for foraging. Where do these troops put all that food? If it's true that an army travels on its stomach, then the army will roll to the front! The woods do seem strangely still, but the troops are almost through them. A trap! An avalanche of blue flows down on both sides of you. Your cavalry can't maneuver. The men are pinned down and caught in a heavy artillery barrage. Before your shouted commands can be acted upon, both flanks collapse. Raising a saber, you ride forward, trying to rally the remnants of your command. You barely hear the whistle of the mortar shell that lands in front of you. . . . DISCONNECT.

* * *

Having recognized his disadvantage early, Barrington was ready with the next arena, and led Weng Chow into the future.

* * *

The high-speed Shikari tanks have finally located the elusive enemy. You dispatch the mobile laser artillery and the armored infantry to assist. As the picture of the enemy forces becomes clearer, three Dart Intruder squadrons and one Perseus missile are launched. Your forces pound into the enemy, forcing him into a

tightly confined area. At this point, you launch the greatest weapon, the Max One, obliterating all of the remaining enemy troops. A solid victory!

* * *

Now Barrington had Weng Chow on the run. Into the sea he led.

Ping . . . ping . . . ping. Another sweep. Still nothing. Head 320 at three-quarter speed. There! Blips. Lots of them. It is either a convoy or an enemy task force. Up periscope. Steady, steady. Fire one, fire two, fire three, fire four. Down periscope. . . . 5 . . . 4 . . . 3 . . . 2 . . . 1—distant booms. Cheers from the crew! Up periscope. It's a task force!! You got a destroyer, and badly damaged a heavy cruiser. Here come the destroyers after you. Dive, dive. Rig for silent running. Level out at three hundred feet, heading twelve degrees north. Wow, those depth charges were close! Think they've given up? Blow ballast, raise to periscope depth. Up periscope. A carrier!!! "Sir, destroyers on the scope closing fast." Easy, easy, easy—fire all tubes! Dive, dive. Blam! Damage report, minor flooding in aft compartments. All secure. Let's go up and see how you're doing. The carrier is on fire. She's going down! Let's get out of here. Fast. Hope you can find room to paint those new wins on your conning tower among all the others. Sure is getting crowded up there.

* * *

The back-to-back victories allowed Barrington to take an entire weekend off with his family. All too soon, the call of battle brought him back. Weng Chow was carefully positioned among the stars.

* * *

Organizing a space battle in three dimensions is never an easy feat. Luckily, the enemy always attacks from the galactic north, so at least you know how to orient your fleets. As the long-distance scanners pick up the enemy advance units, you order the Alliance fleets into a cone formation. If the enemy can be enticed into the axis of the cone, the combined firepower of the Alliance fleets will destroy the enemy forces. Here they come. The Klargon ships look like sitting ducks as they approach in a spherical formation. Down the throat of the cone the Klargons advance, while your fleets hold their fire. Finally, you give the order to attack. The Klargon sphere is washed with enormous energies. The outer layers of ships are peeled off like an onion. Ah, an easy victory.

But wait! The Klargon sphere opens up into a formation resembling a poached egg, but you can't quite make out what is in the center. Oh, no! The Klargons have towed an entire starbase into your midst! The nine giant siege phasors on the starbase are rapidly vaporizing the entire cone. Frantically, you send orders for the fleets to disengage and fall back. Your fleets are disappearing as fast as the orders are reaching them. The ravishing beams of the starbase are slowly rotating. Better get out of here, before they catch you. As long as you live, the Alliance can fight on. Without you. . . . DISCONNECT.

* * *

This last defeat hit Barrington very hard. The shock to his nervous system took several hours to dissipate. As he lay in bed, regrouping, he realized that perhaps this endless fighting should have some deeper purpose. Although Barrington had lost several battles to Weng Chow, he felt confident that in the long run he would win over the evil warlord. Yet, would that victory be enough? Perhaps he could use each conflict to help shape a better future. A gentle nudge here, a soft push there, and the path of man's destiny would be changed. Barrington wondered if it was within his power to ensure that a second Time War never occurred. He decided to direct his energy toward forcing Weng Chow to fight on his choice of battleground more often. He began with 1985.

* * *

The Russians have invaded Saudi Arabia and seized the vital oil fields. You are in command of the U.S. military's most elite troops, the Rapid Deployment Force. Counterstriking within hours of the news of the Russian tank and paratroop landings, you deploy the forces in an effort to regain these oil fields. Quick hit-and-run attacks draw off enemy strength into isolated pockets that are rapidly

mopped up. A feint, a thrust, and the Russians' supply lines are severed. Small forces are left containing different Russian groups, while your main forces are gathered together for maximum impact. This main force attacks each Russian group in turn, overwhelming them. The West's economic lifeblood is secure once more. Certainly, this is an important victory in the development of the future.

The tide of the Time battle had definitely shifted away from Weng Chow. Now was the moment for Barrington to assert his leadership in choosing arenas. He saw the legendary past as an excellent place to strike the next blow at Weng Chow's efforts. For once, Barrington arrived before his adversary, allowing him to prepare the field of battle to good advantage.

The vast Northwold plains of Osgorth are the perfect place for a large-scale battle. The task of planning a proper battle order for hundreds of thousands of widely diverse troops is reminiscent of Darius III's stand against Alexander the Great in 330 B.C. Selection of terrain is most important. Careful studying of a detailed map will yield large dividends in the battle. Before a single troop is moved, it is important to recognize subtleties in terrain. Thus you refuse to engage enemy troops prematurely. The King of Northwold expects you to defend the Sheltered Cities from the Zorg army.

Using the natural barrier of Lake Sinclair for an anchor for the right flank solves part of the tactical problem. Several divisions of light infantry assigned there will serve as a perfect screen for the heavy cavalry. The center of the line consists of several layers. The first line is composed of several divisions of medium infantry. The second line is a mixture of light and medium cavalry. The third line is the core strength of the defense, the rock-solid heavy infantry. The left flank consists of medium infantry, then the extra-heavy cavalry, and last, more medium infantry. Three divisions of light cavalry have been sent secretly through the dense Heywood Forest. If the light cavalry can make good time through the woods, their super speed will allow them to sweep around behind the Zorgs and arrive in the middle of the battle amidst their rear forces. The rest of the light and medium infantry are being held in reserve.

The next day, the hordes of Zorgs arrive. The horizon is darkened with their numbers. There seem to be many more than you had anticipated, but the battle plans are made and you are not going to alter them. However, when the Zorgs never even pause to reorganize in their headlong assault, you quickly need to find some way to slow them down or their momentum will break the center of your line. You give the signal for the heavy cavalry on the left flank to sweep in on their vanguard. While they are getting up steam, you order the medium infantry to throw their javelins and half the reserves to cover the weakened left flank. The air is thick with missiles. Many of the front Zorgs fall, tripping their fellows. Then your ponderous heavy cavalry hits from an oblique angle. They shear off the point of the Zorgs' attack and continue to safety across to your right flank.

This tactic, unfortunately, brings only a slight slowing of their massive war machine. As the Zorgs approach, they suddenly split off their medium infantry and attack your left flank. The rest crash into the center. Your front line almost vanishes without a trace. The second line countercharges, but to no avail. The Zorgs finally crash upon the third line like a giant wave breaking on a reef. The line holds, and the wave is thrown back. The right wing, augmented with the heavy cavalry, is signaled to wheel inward. This applies pressure on their exposed flank.

Meanwhile, the entire left wing is engaged in hand-to-hand combat. The dust raised obscures the battle. Still you wait to commit the rest of the reserves. Should the reserves go to the left, or to the emancipated center? As many of the enemy turn to face the new threat of your right flank, you give the order for the center to advance. A major cavalry battle is forming on the right, while the infantry battle continues to the left. The tide of battle flows around the center wedge. Your left flank suddenly buckles, threatening to collapse completely. You throw the last of the reserves in to stanch the flow, but it looks grim. The right flank is slowly advancing but will

never get through in time to relieve the left flank.

Then, like an autumn hurricane, the three divisions of light cavalry appear and charge into the Zorgs on the left, smashing their formation into small fragments. It becomes a general rout. Less than 5 percent of the huge Zorg army leaves the field of battle that day. The Sheltered Cities are safe. The distant past is now secure.

This defeat was a decisive blow for Weng Chow. Barrington easily chose the next arena, one close to his own time.

The despotic emperor has been finally cornered on a distant planet. The emperor is hidden somewhere on the planet among the feudal city-states. The emperor's Redoubt is fanatically defended by the last of his personal guards. Some of the city-states are sympathetic to the Colony's cause; most are openly hostile. Diplomatic maneuvers occupy much of your time. Messengers have to be sent forth to gather support one way or another. Your troops have been fairly successful with direct combat, and a quarter of the surface is under your control. Still, the hiding place of the emperor eludes you. Only intercepted encrypted messages give away the fact that the emperor is still on the planet. An entire staff is hard at work deciphering those messages. A courier arrives with great news. A large hidden arms cache has been discovered. The code is finally broken! One of the intercepted messages actually contains the location of the Redoubt. Marshaling all the troops, you begin a total assault on the fortress. After fierce combat, the emperor is destroyed. The colonies are free at last!

Grasping for any handhold, Weng Chow took refuge on a single planet in a nearby time of weakness for civilization. Passively, he waited for Barrington to find him for this, his last battle.

The empire lies in ruins, and with its demise dies a dream of a unified mankind. The colonies have all broken off from Earth, almost destroying it in the process. You are commander of Earth's last Starship. The entire planet relies on you to forage throughout space and to bring back desperately needed materials and goods. The twenty colony planets are ready-made targets for the attacks, as you know that success at each will yield needed materials. Stealth and caution are required to avoid attacking too strong a planetary defense until you are more able. Once a primitive or limited-atomic-level planet is sighted, your mighty Starship eliminates any orbiting defenses. When the way to the planet's surface is clear, you dive down, strafing the cities and defenses. The transports with their cargo of fighter planes and troops are released from the Starship. After fierce ground fighting, the planet surrenders!

Now you plunder the populace for the sorely needed supplies and machined goods. As the troops are recalled, you realize that you are now total ruler of an entire planet. What will you do with this unexpected situation? While the planet will serve as a convenient future source of plunder, the possibility exists of also building a starbase here. The awesome realization sinks in: This campaign actually occurs in your own future, not the past. You could use this small beginning to forge all of the colonies into a whole again. Perhaps the ancient dream of unifying mankind is not totally dead. You can be the instrument of that dream's reality.

As the monitor cleared, Barrington sat in front of his computer, deep in thought. His mental reentry into present time required several minutes of orientation. The Starship campaign would be a challenge to command, but now he could relax for a moment from the effort of waging war across time.

Then he found himself thinking forward many years to the beginning of man's first Golden Age. . . .

But First. . . Barrington's epic adventures were codified into legend by the computer game makers of the late twentieth century. If you can name them all, in the order of their appearance here, you may win five games of your own choosing. Send your estimate and choices by June 15 to Softline Strategy, Box 60, NoHo, CA 91603.

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NO TIPPING

Adventurers are invited to respond to the pleas of the stumped listed herein and to solicit aid in turn. Fifty-dollar rewards are given to those submitting tips that the editors judge to be extraordinarily clever, cute, concise, and correct. You would be wise to include your idea of the straightforward solution along with each masterpiece of literary or cryptographic subtlety.

Try to limit yourself to three responses from the Typifieds. Address your entries to *Softline Tip*, Box 60, North Hollywood, CA 91603. There is no particular time limit on these—a good tip is a pearl beyond price and lives forever in an adventurer's heart.

(Tip to tipsters: Include the name of the game to which you are furnishing the tip!)

Mystery Fun House—What to do in the shooting gallery; how to get off the second grate.

And the winner is:

Two approaches you've suggested
In both you should be interested.
The fortune teller gives you a sign,
And what tastes terrible works just fine.
In this game, folks believe what they see,
And a sticky wad can set you free.
—Clay Ruth, Dyer, IN

Ulysses—How do I handle the skeletons?

And the winner is:

If I could save time in a bottle
The first thing that I'd like to do
Is say ancient phrases with reversible meanings
And chop up a skeleton or two.
—Gary Geniesse, President, Zombo Productions, Osprey, FL

Honorable mention (a total coincidence; separate envelopes and everything):

Like the skeletons,
Who of bones are cast,
You'd do well
To note the past.
—Ruth Geniesse, Osprey, FL

Wizard and the Princess—Can't get past the first encounter with the rattlesnake.

And the winner is:

SomeWhere you Will fiNd a rock Without a Wicked Scorpion
underneath.
—Bear Braumoeller, Orinda, CA

Honorable mention to Ted Mead of Port Neches, Texas, who provided an approximation of the above advice in couplet form, and in conclusion drawled:

There's your hint and you can scarcely miss it;
You may use it or lose it or hiss it.
Still, I wonder how you
Missed the in-package clue:
Can it be that your disk is illicit?

More honorable mentions to those providing droll assistance in the matter of plugging the hole in the boat (**Adventure in Serenia**):
Can't plug the boat? Oh, sheet!

—Laurel Goulding, Grosse Ile, MI

Lucy told Linus to take his security device and stuff it. I suggest you do the same.

—Kris Woods, Athens, OH

Mystery House—How do I find the secret passage/I can't get back to the house/How do I kill the killer?

And the winner is:

Commune with nature; climb a tree!
Through magnification, you will see
The entry to a ceiling door.
If you walk around and up one more,
You'll soon arrive at the kitchen door.
Now climb to the room, no time to lose,
For this is the last of all my clues:
With one loud bang and a slight shiver,
You'll win by watching a flower wither.
—Jennifer Tamel, Hales Corners, WI

Escape from Rungistan—How do I open the safe in the saloon? Tried to trade something to the farmer for his rake and he didn't accept.

And the winner is:

So you're in the saloon
And you don't know what to do
Look for some numbers . . .
You'll be glad if you do!

One number is wrong!
Two numbers are right!

The third number you need
Is still out of sight!

So fetch up some water
And use it on cue.
Then on to the east
Toward a tree with a clue!

Now the numbers you have you must type without spaces.
With the right combination
You'll really go places!

But before you go far,
There'll be work to be done.
If you choose to be helpful
A prize will be won!

But don't get me wrong,
Now for goodness' sake!
Be nice to the farmer,
And don't take his rake!
—Judy Simpson, Golden, CO

Mask of the Sun—Can't get through the door at the start of the game.

And the winner is:

I know that it's really a pain
To get out of that confounded plane,

But I'll give you a clue
One word ought to do
If it doesn't, next time take a train.
—Peter T. Clark, Sacramento, CA

And a tip of the tipmeister's toupee to Tom Karl of Saint Paul, Minnesota, who suggests that "since it's a fantasy, think of *Fantasy Island* ('De plane, boss; de plane!')."

Well said, all. Address those entries to
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Typifieds

Adventure

I am trapped in the repository—Brian Cook, Burleson, TX
Where do you get your lamp recharged?—Theodore Chen, Potomac, MD

How do you get the clam open?—Ed Milo, Piscataway, NJ
How do I get the pirate's treasure chest?—Robert Carle, Merrimack, NH

Castles of Darkness

How do you get past the boulder? What do you do with the gloves or pill?—Theodore Chen, Potomac, MD

Cranston Manor

I can get the treasures out of the house but can't get myself out of the lift! Can't find the treasures outside, and can't figure out what to do with the pump.—Donna Alderson, Carmel, NY

Cyborg

I cannot find an ID card, or more than two powerpack units.—Mike Patterson, Lake Zurich, IL

Deadline

How do you get to the hidden closet?—K. Patterson, Mount Laurel, NJ

Empire of the Overlord

On the second planet, the princess and I can't get back across the ice field or the desert. Can't get here with the blanket or the waterskin.—Blake Craighead, Rock Hill, SC

G.F.S. Sorceress

How do I activate the robot on Rigel X? How do you break through one of the walls in the small room in the castle on Altair 4?—Robert Soderquist, Salinas, CA

Kabul Spy

Darcy Higden: David Nichols wishes to correspond. Send your address to this column if agreeable.

Knight of Diamonds

Which of the three doors do I go through?—Jaimie Edidin, Jacksonville, FL

Mummy's Curse

How do you get some gold to buy the knife and shovel?—Jon Salmons, Chicago, IL

Mystery Fun House

What do you do to the calliope?—Theodore Chen, Potomac, MD

Prisoner

What do you do when you get to the third part of the physical-education course? What is the chair for with all the musical notes?—Mike Doucette, Tucson, AZ

SAGA #8: Pyramid of Doom

How do I get past the giant oyster and the iron statue? Every time I pull down the spiral staircase, the statue tears me apart!—Erick Goldhammer, Rutland Town, VT

SAGA #12: Golden Voyage

How do you get down the stairs and get rid of the statue?—Chris Nemcek, Coral Springs, FL

Sherwood Forest

I have the uniform and I don't know what to do. I can't get any further.—Kent Hathaway, Milwaukee, WI

Starcross

How do I get the blue rod from the sphere and still have enough gun blasts to reach the forward bubble?—Rick Volberding, Cass Lake, MN

How do I get the red rod from the rat-ant's nest? Where are the appropriate slots for the rods located? How do I open the fused door in the guard room?—Mike Cline, Cupertino, CA

Temple of Apschai

Can someone tell me why an award is given to a character with intelligence 0, strength 0, wisdom/intuition 112, and 208 number-two treasures?—Warner Young, Madera, CA

Yes: *It's called a bug. Send it to Automated Simulations for replacement—attention Tim Krutilla. Hey, do I win fifty bucks?*—Ed.

In your dreams.—Pub.

Transylvania

How can you open the door in the case?—Jon Salmons, Chicago, IL

Ulysses and the Golden Fleece

How do you get past the hurricane? (*One of the most popular single questions received. A special award of \$100 will be given to the author of the best response.*)

Wizard and the Princess

I'm wandering endlessly in the castle, graffitied shoes in hand. Now what?—Vivian Vande Velde, Rochester, NY

Thanks to everyone who wrote in about the coin. The wizard is now cat food and the princess is safe at home.—Jeff Frank, Albion, MI

Zork I, II, and III

These are probably the three most often-queried games extant; we'll have a special section on them next issue. In the meantime, we recommend the *InvisiClues* books of the Zork Users Group. The invisible ink hints come with a developing marker pen to reveal only as much as you want to find out. For info, send a stamped, self-addressed business envelope to Zork Users Group, Box 20923, Milwaukee, WI 53220.

Personal assistance is offered by Zorkmaster Mike Patterson, 23529 North Park Road, Lake Zurich, IL 60047. 

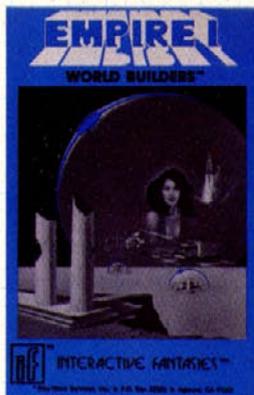
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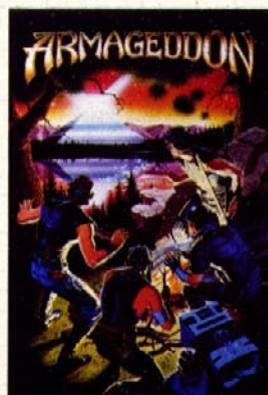
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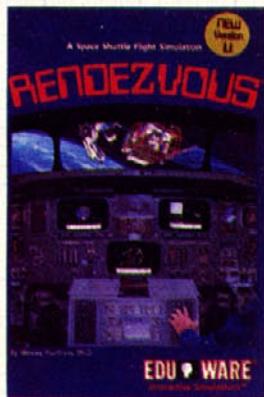
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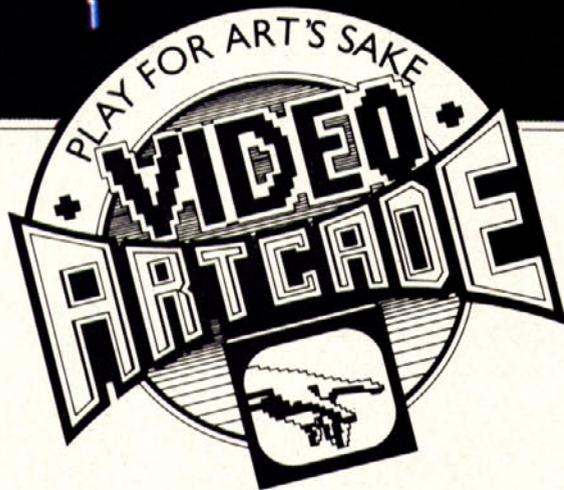
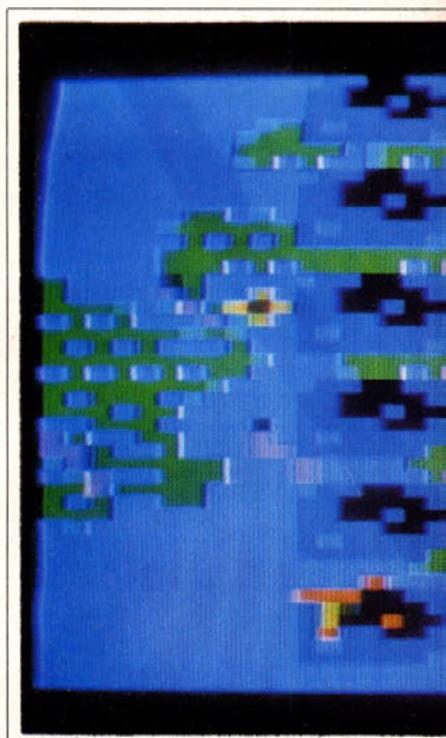
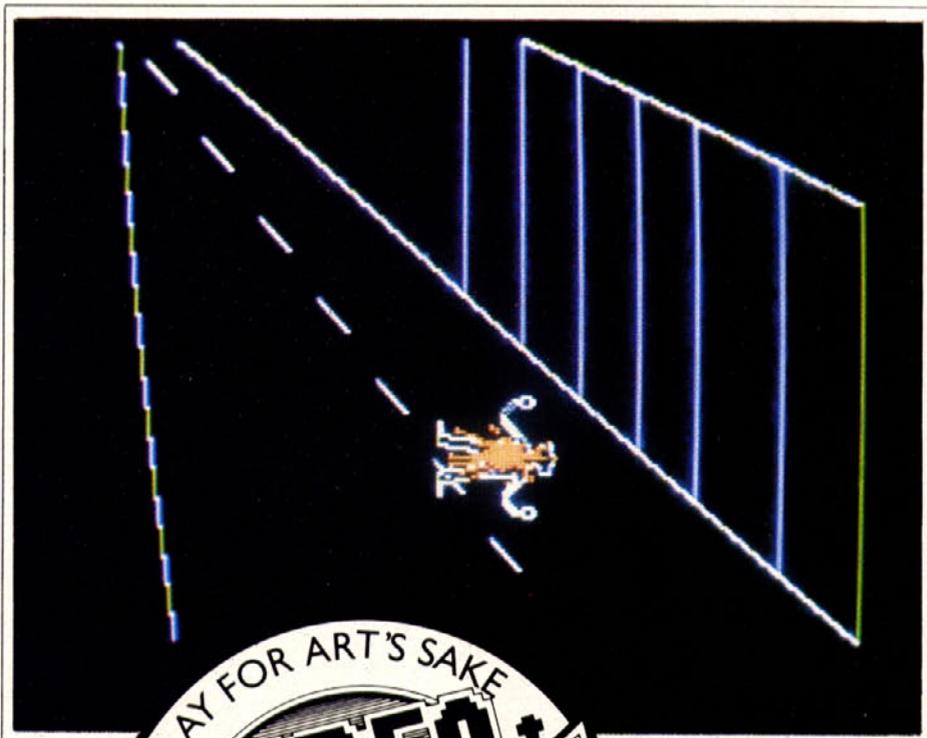
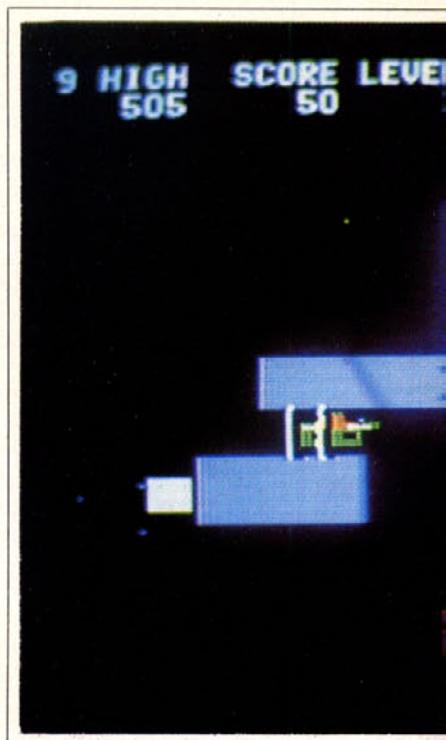
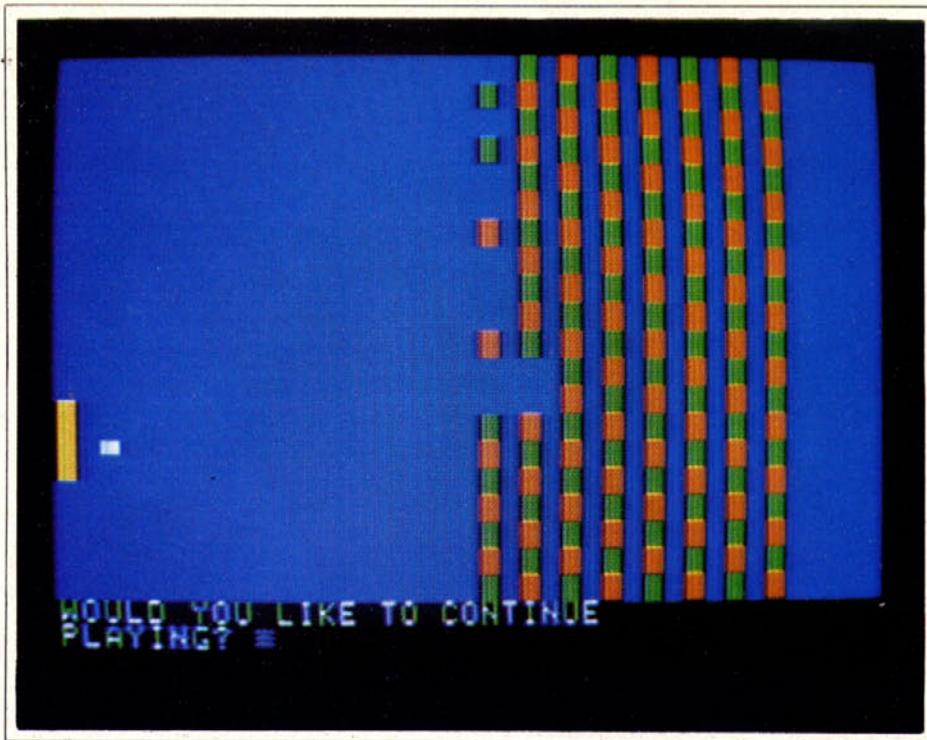
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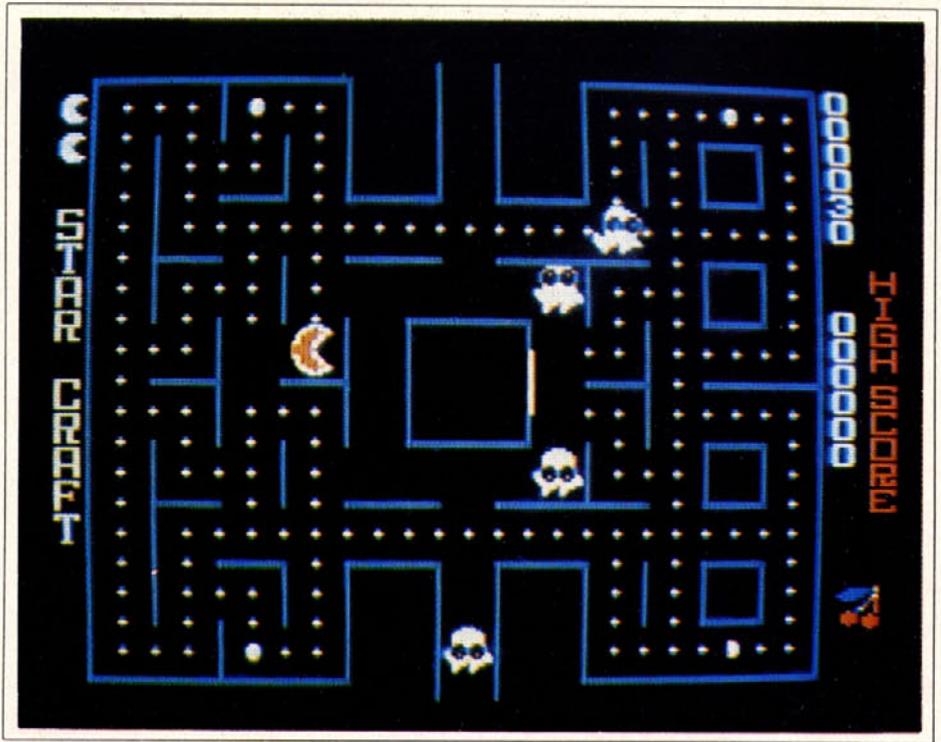
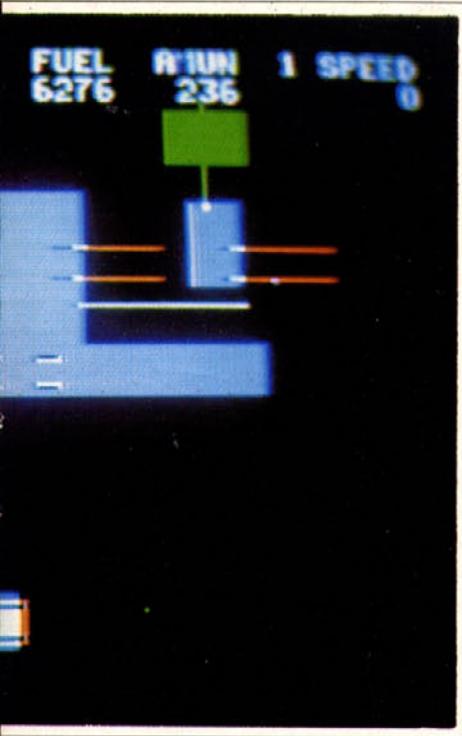
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by Antoine de St. Cyr-Creully

NEW YORK, 1905—The Metropolitan museum was the site of the first exhibition in the United States of "modern art," featuring primarily the antirepresentational, flat color-field works of the new French expressionists. The reaction in the art world was that of a near-riot. People were not happy. Critics called it the work of wild animals—"fauves," in the French. It was vulgar and low. The departure from all that had gone before was an extreme one.

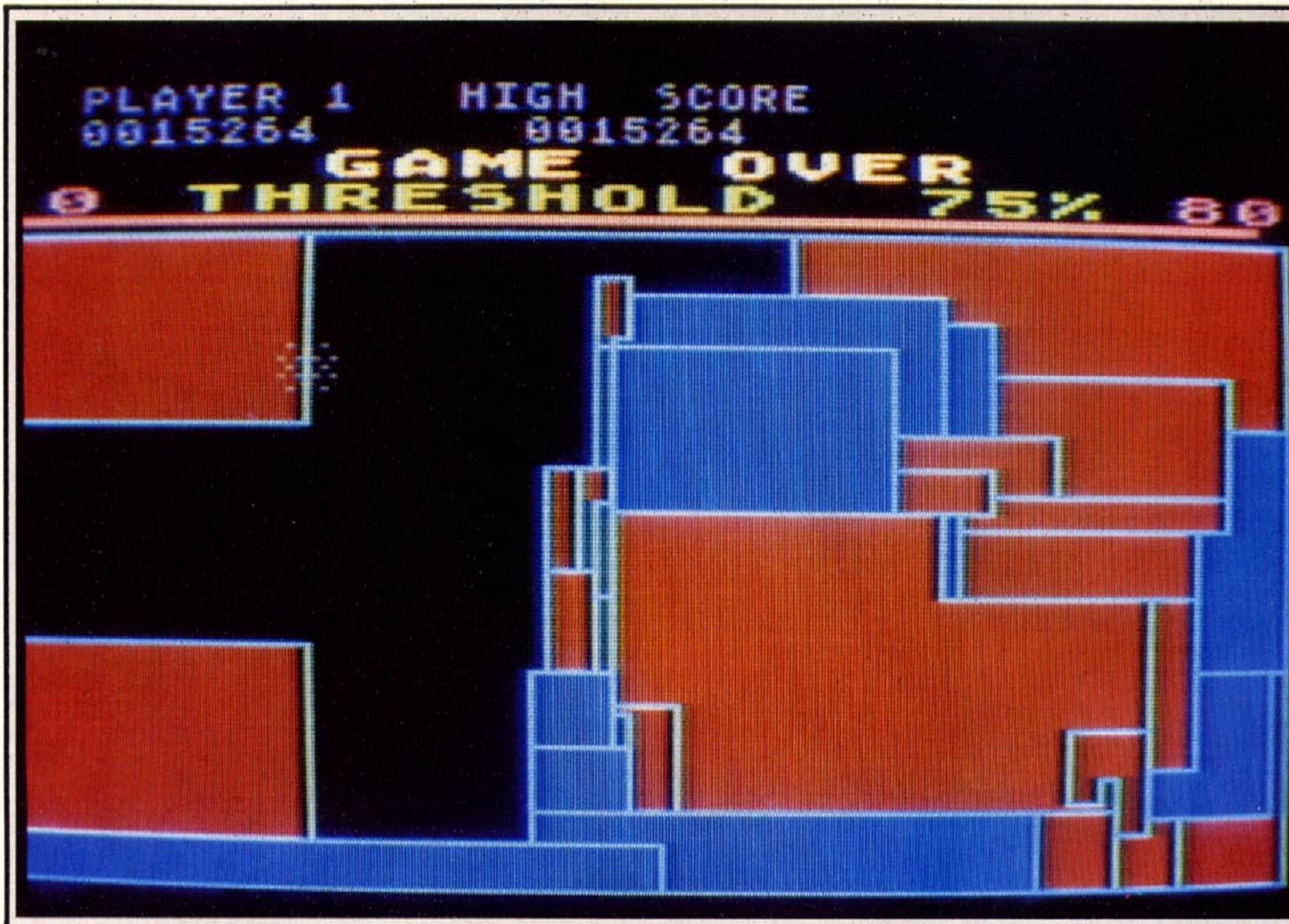
WASHINGTON, D.C., 1983—The Corcoran gallery was the site of the first video game art exhibition in an American museum. The proposal of an art exhibit consisting of video games, home game ma-



THE ART OF GAMING



chines, and home computer games raised a few eyebrows when a museum trustee first proposed it, but overall we now live in more tolerant times. There was also the added legitimacy of a charitable event—a Friday night celebrity fund-raiser for the Corcoran School of Art Scholarship fund. A black-tie, invitation-only audience paid thirty-five dollars a head for wine, a salad bar, ice cream sundaes, and free tokens to allow them to compete in the Video ARTcade celebrity play-offs with columnist Art Buchwald, painter and sculptor William Christenberry, *Washington Week in Review* host Paul Duke, D.C. councilpersons Polly Shackleton and Betty Ann Kane, former White House press secretary Jody Powell, artist Peter Max,



Redskins offensive tackle Mark May, and Canadian ambassador Alan Gotlieb, among others.

So much for the bread and circuses. Such things are well enough left to the hulking, garish coin-ops and the shallow, vulgar home game machines. What of art? What about computers—the Machine of the Year, and all that?

“Don’t ask me,” shrugged Fred Schwartz, Washington lawyer, Corcoran trustee, and organizer of the whole artistic bash. “We must have sent out a hundred notices. I guess the word just didn’t get out. Maybe it’s just as well, since most of the hardware people wouldn’t send us machines to run them on anyway.”

True game art was represented by one lonely Atari and one lonely Apple II Plus, aiding in a separate competition to judge the most artistically valid computer game software. Judges were Christenberry, graphic designer and kinetic sculptor Sam Holvey, and multimedia artist and sculptor Robin Rose.

And the winner was . . . Broderbund, for *Choplifter*, both Apple and Atari.

William O. Barrett, dean of the Corcoran School, waxed philosophical on the meaning of it all: “The creation and playing of video games requires, like many art forms, the manipulation of form and color in time and space. While clearly at its beginning stages, video technology has the potential to create a legitimate and exciting means of artistic expression. We hope to encourage this potential through our Video ARTcade.”

Despite the scanty representation, there’s always next year, maybe, and the Corcoran would love to hear from any of you computer game/programming folk. Mr. Schwartz suggests, however, that you don’t tell them where you found out about it.

Thanks, Fred.

REPORT FROM THE 23RD CENTURY

“It’s possible that video games will be the art form of the 21st century.”

—Frederic W. Schwartz, Jr., Corcoran museum trustee

SUNNYVALE, April 15, 2233—Lost art treasures found!

The computer game art world has been abuzz with the news of the recent discovery of examples of classic late-twentieth-century computer game art, unseen for hundreds of years and believed lost. The priceless cache, excavated from the ancient, burned-out ruins of a Southern California discount computer store, may be the most significant art find of the twenty-third century, as it clearly shows that the trends and techniques of the art of today are directly traceable to the Silicon Valley region of California in the late 1900s.

Of the five works on display in our gallery, carbon disk dating has determined the leftmost screen to be the oldest of the group. What a revolution it must have precipitated, representing, as it does, the abandonment of realistic representation of natural forms in order to display a compositional theory in a thoroughly abstract context. The statement of the single square, in constant, direct linear motion, contrasting with the monolithic vertical presence of the right side of the composition, makes an extremely dynamic state-

QIX AND THE ABSTRACT IMPERATIVE

"His work is not the juxtaposition of happily balanced surfaces but an attempt to synthesize the opposite forces of the real world with the simplest possible graphic expression."

—J. R. Soto on Mondrian, *Signals*, November 1965

With *Qix*, Atari has created its masterpiece. It is a radical break with the traditional forms on which its career has heretofore been built. Indeed, all the most admired home computer game art, pre-*Qix*, has been that which achieves the closest approximation of life and recognizable organic forms. *Qix* remorselessly exposes these bourgeois exercises, experimenting boldly with a cool, geometric imagery that may turn the home computer art world upside down and finally create the breakthrough in personal computer abstract art that Atari did not quite achieve with *Qix* in the video parlors (silver medal winner, Corcoran Video ARTcade).

This is not to say that *Qix* is devoid of human gaming values at the heart of all great computer game art. Though *Qix* is avant-garde, it does not make the artistic mistake of divorcing itself utterly from its past. The Chaplinesque efforts of the Marker to draw its simple Stix while avoiding being caught in the impersonal machinations of *Qix*, the whirling helix, and the sputtering menace of the Sparx is a moving statement. Can life endure in this regimented, automated world?

Atari attempts to answer the question in the actions of the Marker (symbolic of the artistic impulse), which acts upon its environment to create an aesthetically pleasing work, even though it risks

ment. The necessarily confined movement of the vertical bar on the left and the fact of the ever-diminishing presence of its fellow vertical solids, for which it is ultimately responsible, creates a tension and anxiety in the viewer that can only be resolved in play.

The forms used in this early piece were a very popular motif of late-twentieth-century art, as evidenced by the second screen, a later composition in a different vein, but with obvious connections to the perceptual abstractionism of the earlier work. Here, the artist has chosen to make his point using depth of field, bringing a dramatic foreshortening to the composition. Rejecting aesthetics in favor of a solitary dialogue between man and the universe, the artist brings his square blocks of color boldly to the forefront, daring the viewer to find their meaning before they disappear.

One of the most exciting aspects of this find is visible in the third image, containing what seems to be the original imaging of the most powerful icon of its time, the all-consuming circle. This form, with its near-infinite capacity for absorbing other forms, predominated in the popular art and folk tales of the day and is repeated over and over in the cultural artifacts that have come down to us. Its mystical terror and majesty is captured here, along with the suggestion of the power of the non-object to objectify itself. (See *Pac-Man Candy*, Fleer, 1980.)

The neo-Romantic rejection of theory and intellectual artistic tenets in some quarters is evident in works like that represented in the fourth screen. The depiction of the plight of a humanoid attempting to scale a building marks a return to primitiveness, combined with the avant-garde principle of irritating the spectator. The formal derivatives seem trivial, but it can be assumed that the forces of realism exerted a strong influence on the artist, making it difficult for him to break free of naturalist restrictions and enter into the

perishing to do so. Something there inside cannot be denied, though the *Qix* keep getting harder to find.

The issue raised by Atari is nothing less than the imperative of the creation of art as a means of survival—the means of creating the social contract, at its most imperiled in the modern industrialized society. The urban symbolism is brought home especially strongly when you make a lot of vertical boxes at the bottom of the screen, tall ones and short ones, so it looks like a city skyline in a Dick Tracy cartoon. (Tracy's celebrated ironic rejection of formalistic overrefinement in his facial structure makes this a particularly droll juxtaposition.)

At the same time, the dichotomy inherent in the traditional impulse to art is implicitly ridiculed: How can we even attempt the creation of static expressions of aesthetic theory when our extinction is imminent, and, indeed, when a single-minded concentration on the artistic act hastens our extinction? We cannot, of course, and the true art comes out of the struggle itself, producing the tension inherent in the spatial relationships of large and small fields of blue, coexisting randomly and divided by shimmering white lines of purity that lend balance and order to the action of the composition. This is thrown into chaos by the sudden crimson planes introduced by the constant button-press slowdown technique. The resulting vulnerability symbolizes an inner strength, rewarded by double points.

In the grip of the strange exaltation that moves us again and again to attempt to cut off the helix, we throw ourselves into the creation of the mysterious eternal patterns in our never-ending attempt to cover as much of the area as we dare; as much as the unforgiving and uncaring helix will permit; until reaching almost 75 percent, when we must move to confront our demise face to face for 1,000 bonus points for any additional percentage filled in.

Technically, this is the most successful adaptation of the periodic structural theory of Piet Mondrian yet adapted to a home computer. It further closes the distance between spectator and art, and is as pure an expression of game art as we are likely to see for some time.

realm of pure abstraction, using color field painting or an action-plastic dynamic. The force of this work is in its very "thingness"; its stubborn insistence on the presentation of a theme of existential symbolism of man alone and helpless and bleeding to death on a road. It makes its point, no matter how naively.

Finally, we come to the last work in the exhibit, which suggests the fauvists in its use of brilliant colors rather than delineated forms to suggest the object. Embracing the surrealist idea of the primacy of the artistic process over the product, using spatial ambiguity and the anti-object of conceptual art, this superlative game screen forces a new way of seeing on the viewer. The kinetic assemblage of geometrical forms produces an interchangeable figure-ground relationship for a new universality of image, one of the most cherished themes in art.

And Now, a Word from Our Sponsor. Alas, none of these rediscovered masterpieces can be identified by name. All had only working titles, applied, no doubt, by careless middle-period historians, lackluster appellations that merely describe the action for purposes of reference—*Hadron*, *Human Fly*, *Snoggle*, and the like.

Can anyone supply more suitable titles for these treasures? They should have that certain something, a dignity befitting their historical place and artistic importance. Real oomph. It is likely that you, the readers, have some similar treasures tucked away and are capable of sending an appropriate photo or screen dump to us, to which you could append a suitably impressive title. No more than five, please.

Three classic examples of game art of your choice will be supplied to the most inspired among you who come up with the most impressive-sounding catalog of vintage game art titles. Send them to Softline Artsy, Box 60, North Hollywood, CA 91603, by June 15.

GAMELINE

Wall War

By Peter Oliphant.

It always seemed as though the concept pioneered by Atari's arcade game *Breakout* would be intriguing if modified for two players. Atari itself explored that notion with *Warlords*, but it was left to Peter Oliphant (and the Atari computer) to produce a satisfactory result.

The game is *Wall War*, and it is slick.

Each player takes the part of a Microbot, an exotic fighting machine designed for maximum maneuverability and battle strength. The joystick-controlled Microbots move horizontally between two bumpers. Each guards a plasma field, which in turn cages the fierce little Microcytes of Death (Oliphant does love his purple prose). Once a plasma field is destroyed, the Microcytes escape and disintegrate the corresponding Microbot.

The Microbots are separated by five moving walls of color segments, which must be damaged before the players can attack each other. The walls move in alternating directions, so it is difficult to position killing shots until a major portion of this central field is destroyed. The players must be careful, however, not to destroy the walls completely. If only three segments of any color remain, they begin to flash (and are worth more points when hit); if those are destroyed, the entire wall forms again (a fact not mentioned in the instructions).

Microbots can fire rapid straight missiles or slower guided missiles (which pierce enemy defenses in response to the player's movement). Guided missiles can be destroyed by the maneuvering lasers positioned at the sides of the Microbots, so their effectiveness is questionable. If a Microbot's gun is hit, it is put out of commission for roughly half a minute; if a side laser is hit twice, the player loses the ability to use it for the same length of time.

The battle between two human players is termed a "sparring match" and ends when either Microbot is destroyed. One player can also play the computer in a sparring match, but it is not much of a challenge . . . even when the computer opponent is set to the highest of fifteen levels. Play-testing proved that the player could win by using only fast missiles from a fixed position. Any computer opponent ignoring such an immobile target is not worth its microcircuitry.

A solitary player may also play the game for points, in which case the game will not be over until the player's plasma field is destroyed. Typing "H" during such games will display the current high score.

Both styles (point games and sparring matches) may be demonstrated; that is, the computer will play itself. It is essential to begin by watching one or both of these demo modes, because the badly written instructions are incomprehensible. Oliphant desperately needed to submit them to somebody as knowledgeable in semantics as he is in programming.

These small shortcomings do not negate *Wall War's* superb hires graphics or the tone of jousting competition it ignites between two players. The game is cleverly designed, from the Microbots that materialize on-screen at the beginning of the game to the stylish banner page. The price is reasonable, and *Wall War* is highly conducive to repeat play.

DB

Atari 400, 800, or 1200; 48K, disk; joystick required. \$29.95 from Sierra On-Line, Sierra On-Line Building, Coarsegold, CA 93614; (209) 683-6858.

Suspended

By Michael Berlyn.

Probably the newest and neatest wrinkle in adventuring is the ability to separately control multiple characters simultaneously. Not

content to accomplish this logistically difficult trick with two or three characters, Michael Berlyn gives the player six different robots to control in *Suspended*. Each robot can be sent scurrying around the adventure, performing different tasks at the same time. There are occasions that require the combined talents of several of the robots working together to solve a particular problem.

The six robots all have their own personalities and attributes. The robot called Iris is the eyes of the team. Waldo has the strength to pick up and move heavy objects, or the delicacy to perform microscopic operations. Auda hears, while Sensa senses. Whiz is your link to the main computer banks. There, detailed information on a wide variety of subjects can be gleaned. Poet is the real delight of the game. Resembling a psychedelic James Joyce, Poet waxes eloquent on anything he is asked to describe. Deciphering these verbal clues is slightly harder than understanding the pronouncements of the Delphi Oracle, yet important hints are often contained therein.

The player is not physically active in *Suspended*. The body is in cryogenic suspension, but the mind is active. It is your mind that controls the actions of each robot via computer link-up. The scenario places you aboard an orbiting space station years in the future, where scientists have finally managed to control the weather. Large meteorology stations around the globe artificially maintain perfect climate. Substantial building structures are no longer needed to protect people. Most transportation is either by outdoor moving walkways or by aerial taxis. Food supply is completely computer-controlled. This space station was set up many years before to oversee weather, transportation, and food production. Within the station are the controls for maintaining perfect balance between all the factors. While most of the routine maintenance can be handled by the computers and the robots, a human was installed aboard as a fail-safe device.

The player is awakened from cryogenic slumber to find all hell breaking loose. Alarms are clanging and explosions are rocking the space station. Parts of the station's controls have been damaged, throwing the weather out of control on the planet's surface. The population below is totally unprepared to cope with this crisis and is suffering massive casualties. Without ever leaving the cryogenic chamber, you must repair the space station utilizing the various skills of the robots.

Unlike most adventure games, *Suspended* can be played over and over again, even though the solution is known. At the end of the game, the player is told how many people died while repairs were being done. More efficient means of using the robots will yield lower casualties.

Once again Infocom earns praise for continued breakthroughs in packaging and merchandising. The box is a real eye-catcher. Inside is a large game board showing the layout of the space station and stick-on disks for each of the robots. You do not have to keep the current locations of each robot in your head.

Suspended represents another milestone in the continuing evolution of the interactive computer novel. This form of literature may be one of the most important waves of the electronic age, and Michael Berlyn and Infocom will certainly be riding on the crest of that literary wave.

RRA

Apple II, II Plus, IIe; 48K. Atari 400, 800, or 1200; 32K. TRS-80. Commodore. IBM pc. CP/M 8-inch. Osborne. DEC. NEC. \$49.95 from Infocom, 55 Wheel-er Street, Cambridge, MA 02138; (617) 492-1031.

Preppie! II

By Russ Wetmore.

And now, another visit with the lovable Argyle Twins, Buffy and Scooter.

"Hello, dear brother Buffy, what's that you're playing?"

"Oh hello, my sweet sibling Scooter. It's *Preppie! II*. The game package said it was a game for us prepsters, so I just couldn't resist spending more of Daddy's money to get it."

"How *absolutely* marvelous, Buffy. But isn't it just like the original *Preppie!*?"

"Scooter, you fenderhead, how *can* you be so dim? Mummy's side of the family is so prevalent in you. *Preppie!* was the game where Wadsworth Overcash had to pick up golf balls on the Nasty Nine. This continues the saga; here, he's sentenced to paint the floors of three separate mazes, while avoiding contact with those beastly frogs, lawn mowers, and trucks."

"*Absolutely* primitive. Come along; Muffy and I are going to pick her out a dress for next week's cotillion."

"Can't. I've got all the frogs trapped behind the revolving door; now's my chance to finish the maze. Once you go through these revolving doors, the frogs get trapped on the other side."

"Like trapping those peon bellboys at the Plaza, eh Buffykins?"

"You got it. There, did it! All the mazes are now pink."

"Smashing. But why are you starting over, my lovable brother?"

"There are five levels to get through—madras pink, powder blue, lavender, peach, and chartreuse."

"Oh, color coordination to the utmost! Just like the beach house where we summered last August; how *absolutely* primo! Let me have a go at it, Buff."

"Why certainly, Scooter. When things start getting hectic, you can just leave the maze and immediately return. When you come back, all the frogs go back to their corners again."

"How *absolutely* choice, Buffy! But I'm afraid this game is too much for me. It's too fast! Croquet mallets are more my style."

"Silly brother, that's because you're playing at the advanced level I was on. You can pick any of the first four levels to start at, just like picking out trousers at Abercrombie and Fitch, only here you get an ultrachic cloaking device."

"Excellent! What happens after I finish painting all these mazes, though? Do I go on to mow the lawns on the putting greens?"

Beating the Classics

Ever wondered why we manage to scrape together only a handful of ships to face an attack of thousands of alien invaders?

That sure wouldn't be the result of most of our government's defense plans.

Two classic arcade games, *Defender* and *Galaxian*, finally have appeared for Atari's computer line. The bad news is that both are available only in cartridge form, the most expensive of the three software media. Since *Defender* is unique among shoot-'em-up games, Atari's recognition of its captive audience may have influenced that decision. Too bad. The game's appeal does not justify its unreasonable cost.

The decision to do the same with *Galaxian* is a little more mysterious, since numerous variants exist (*Galaxian* itself is little more than a modified *Space Invaders*). This one would have been better off on disk or cassette.

Defender drops the player behind the controls of a space fighter equipped with missiles, smart bombs, and hyperspace drive. Those are controlled by, respectively, the joystick trigger, the keyboard space bar, and any other key on the computer. The fighter thrusts left, right, and rises and falls according to joystick commands.

The invading force is composed of numerous aliens. Landers (green) attempt to kidnap the ten remaining humanoid survivors who move on the planet's surface. Humanoids captured and carried to the top of the screen change into Mutants (yellowish), which move quickly and try to destroy the Defender. (That's gratitude for you.) Bombers (orange) seed the sky with mines (crosshatched Xs). Baiters (red and green) act like impatient referees and fire on the Defender if it takes too long to eliminate any single wave of attackers. Pods (pink), when destroyed, release a salvo of swiftly moving Swarms (red).

If all this sounds pretty hopeless, it is. . . . *Defender* remains one of the hardest arcade games ever developed. Initial attempts lasting less than ten seconds are not uncommon

for novices. Unlike most of Atari's other games, *Defender* has no beginner settings; the player is dumped into the shark tank.

By far the cleverest concept in the game is the view screen at the top of the game field. It shows the entire planet surface, with specks representing everything the player can expect to encounter as the screen scrolls from left to right or vice versa. This allows the player to anticipate enemy attacks and react accordingly.

The player starts with three ships and three smart bombs; an additional bomb is awarded for every ten thousand points achieved. It'll be a while before the average player sees that fourth bomb.

Galaxian also starts the player with three defending spaceships, with the promise of just one more when the score reaches five thousand. The ship, which rests at the bottom of the screen, moves back and forth to joystick commands and fires missiles when the trigger is pushed. The Galaxians appear in waves at the top of the screen. They shift back and forth, as in *Space Invaders*; unlike that earlier game, however, the Galaxians peel off and make strafing runs at the player's ship.

Galaxian has ten levels of difficulty plus an eleventh ("B"), recommended for beginners, in which the aliens do not fire missiles. The game may be paused by hitting the space bar.

Although zapping aliens usually results in a white burst of light, occasional hits inexplicably produce an Atari logo. Seems a peculiar place for a commercial.

Galaxian belongs to a family of arcade games no longer as popular as it was several years ago. Since the industry has become more imaginative in the meantime, this game becomes tedious pretty quickly.

Mention must be made of the superb instruction pamphlets accompanying both games. The directions are short, clear, and accompanied by crisp color illustrations.

However dazzling the pyrotechnics, it still isn't a fair fight. Earth really should do something about better equipping its space fleet.

Atari 400, 800, or 1200; cartridge. Both \$44.95 from Atari, Box 427, Sunnyvale, CA 94086; (408) 745-2000.

DB

SI

Groom the polo horses?"

"Come on, Scooter; be real! It's just the same game at various skill levels. If you want, you can play by yourself or against somebody else. And, if there are two players, you can use one or two joysticks."

"But we only have one stick, Buff. Guess we'll just have to ask Mumsy to buy us another. Anyway, are you coming with Muffy and me, or not?"

"No thank you, dear sweet kind loving brother. I have to pack my bag. I'm going up to the Cape for the weekend with the Butterbottoms."

"Always a prep, Buffy; always a prep."

"Thank you."

MTY

Atari 400, 800, or 1200; 32K, disk; joystick required. \$34.95 from Adventure International, Box 3435, Longwood, FL 32750; (305) 862-6917.

Phobos

By Greg Christensen.

"At long last, the Martians retreated, their cavern strongholds destroyed by waves of tireless space cadets. Mars had become safe for human settlement. One group of renegade Martians, angered by the presumptuous outworlders, established a command center on Phobos, Mars' closest and largest moon. From there, they plotted the downfall of Mankind. . . ."

—Terran Space Colonization, Volume 3

That group of Martians clearly included the architects responsible for the *Caverns of Mars*, because the twisty passages of Phobos are strikingly similar. Martian engineers must not do too well with original thinking.

As a result, those who have eagerly awaited wunderkind Greg Christensen's next game may be somewhat disappointed. Any folks unfamiliar with *Caverns of Mars* will find *Phobos* well designed and entertaining; the rest will correctly identify it as a reinvention of the wheel.

Christensen has made some improvements not found in his first game. Most welcome is the pause option using the space bar—large enough to strike at even the most heated of moments. There are four skill levels—novice, pilot, warrior, and commander—and, if you get in over your head, reset works any time during play to return to the title screen and let you choose a new skill level. Then you don't have to kill off several remaining ships to end a game.

The skill levels are well designed. Novice is a reasonable entry-level challenge that gives a good glimpse of what is to come. It covers only the first five and the last of Phobos's sixteen caverns; the last always contains the Martian headquarters. Pilot-level players struggle through the first nine and the last; warrior, the first thirteen and the last; and the commander level catches all sixteen. The game isn't difficult until level seven.

The player is represented by a spaceship run by the joystick. The fire button releases missiles from cannons located on either side of the ship, but the cannons fire alternately rather than simultaneously. (Survivors of *Caverns of Mars* will need time to adjust to that.)

Those first four caverns are obstacle courses with ledges holding fuel tanks, missiles, flying saucers, and explosive dumps. Fuel tanks must be destroyed to maintain the ship's fuel supply. Missiles don't fire and saucers don't fly; they just sit, like ninepins, and wait to be blasted. As a result, they're not much of a problem. An explosive dump can be detonated safely only if the ship is at least four inches above it. From the top (no doubt intentionally), dumps resemble fuel tanks.

Later, caverns contain variations on force-beams. Some flick on and off; some are thin and others fat; some contain ship-sized holes that move left to right or vice versa. By far the toughest are two consecutive caverns that contain beams punctuated by swiftly moving holes. Time is insufficient for a quick vertical drop, so the player must move diagonally in tandem with the hole—a difficult maneuver with Atari joysticks.

Phobos is enjoyable, but it's too easy for survivors of *Caverns of Mars*. If you haven't played *Caverns of Mars*, *Phobos* is a good choice. *Mars* veterans should wait—presumably—for *Deimos*.

(Another moon . . . another June . . . another season . . . another reason. . .)

DB

Atari 400, 800, or 1200; 16K, disk; joystick required. \$29.95 from Atari Program Exchange, Box 3705, Santa Clara, CA 95055; (408) 727-5603.

Serpent's Star

By Alan Clark, Larry Franks, Christopher Anson, and Margaret Anson.

Did you ever stop to think how similar Tibet is to Mexico? Both are countries, both have temples, both have statues, both have caverns, both have hidden treasures, and both are settings for Ultrasoft moving adventures.

In fact, if you think back to your last visits to each of these locales, you'll remember that they aren't really very much alike at all. The Ultrasoft adventures, however, are.

Which means that if you liked *Mask of the Sun*, you'll probably like *Serpent's Star*. Most of us did.

Once again, Ultrasoft's nicely done graphics move the adventurer through the intervening countryside—or corridors—in the process of getting from place to place. Lots of snow in Tibet. No tigers, though. For hurried people who'd just as soon cut out the distances between places in real life, much less in adventures, there's an addition in *Serpent's Star*—the option to curtail the movement.

The plot again revolves around the search for jewels. In *Serpent's Star*, the quest takes the adventurer into the depths of Eastern religious cults. If you've never heard of karma, have a dictionary—better still, an encyclopedia of world religions—at hand while you play. You'll learn something.

MCT

Apple II, II Plus, IIe; 48K. \$39.95 from Ultrasoft, 12503 Bell-Red Road, Suite 200, Bellevue, WA 98005; (206) 451-8104.

Pollywog

By Alan Wootton.

Said the great gamemeister to the aspiring game programmer, "Listen, man. If you're going to make it in this biz, you've got to come up with something different. Another version of *Choplitter* or *Miner* just ain't gonna cut the mustard."

Something different, eh? When the Beatles were looking for that different sound, they came up with intentional feedback in *Paperback Writer*—and it worked. The same way the Beatles used feedback, a conventionally undesirable effect at the time, Top-Notch has reintroduced the concept of lo-res graphics in a game.

Lo-res? Lo-res? Nobody does games in lo-res. With such beautiful hi-res in the II and the super hi-res possible in the Apple IIe, Revision B, how could anyone have the audacity to release a game with lo-res graphics?

Though the game is in lo-res, it's in good lo-res, and that's not a contradiction in terms. The graphics aren't anything you'll learn how to write by reading the *Applesoft Tutorial*; it's much more complex than that. The title creatures respond very well to joystick control, though their movements, as well as those of the creepies and killer fish, still have that characteristic jerky, strobe-light look. Wootton makes use of fifteen different colors (lots more than most games have); without a color display to take advantage of them, things can get pretty messy—as in "impossible."

Top-Notch doesn't have a lot of employees, and it doesn't have a lot of venture capital when compared to game powerhouses like On-Line and Sirius. But what it does have is guts—enough guts to debut with *Pollywog*, a product so different from anything else on the market that it could have been named *Sink or Swim*.

That would have been a more appropriate name, since the object of the game is survival. The game begins with three batches of eggs (comparable to three ships, for you shoot-'em-up fans). When the first batch hatches, your polliwogs must swim around the pond, eating as much algae as their little tummies can hold. The more algae they eat, the bigger they grow.

At the same time, nasty orange creepies are trying to kill your polliwogs; their touch is lethal. And if the creepies aren't tough enough for you, there's always the attack of the killer fish. Polliwogs that manage to survive the pond's perils will grow into healthy creepy-eating frogs and lay their own eggs. From that batch of eggs

might hatch a royal blue polliwog who, if he lives long enough, will become a human prince.

There are two ways to go in this game. As soon as polliwogs eat up all the algae, you advance levels. You're rewarded for the number of polliwogs you have left at the end of each level; you get lots of bonus points, and, the more polliwogs you have left over, the more levels you advance. Thus, you could go from level ten to eleven, or from ten to twenty-one. Fast algae-eating will get you to those levels sooner, but hanging around and waiting for more algae to grow, and then eating it, will let your polliwogs mature into frogs.

And now, the sound effects: get down, get funky. *Pollywog* plays to a syncopatin' boom-chicka rhythm, and toe-tapping melodic riffs emerge when polliwogs are eaten (almost worth dying for). It's got a beat, and you can dance to it.

Pollywog requires a joystick with at least two buttons. One button scatters the polliwogs, one gathers them together, and both at the same time lay the eggs.

There is no middle ground in appreciating *Pollywog*; you'll be at either one end or the other. Trigger-happy arcade lingerers with penchants for simulations of shooting, killing, bombing, shooting, killing, and shooting will take one look, if that many, and roll their eyes, muttering, "Oh, gawd! Feed me a Broderbund disk, and hurry!" Gamers looking for something innovative and artistic might hang around a little longer.

Even if *Pollywog* doesn't top the charts, it's an indication that Top-Notch has its nose pointing in the right direction. MTY Apple II, II Plus, IIe; 48K, disk; joystick required. \$29.95 from Top-Notch Productions, 1201 Montana Avenue, Suite 5, Santa Monica, CA 90403; (213) 395-9591.



The Dark Crystal

By Roberta Williams.

In a way, it's better than the movie. Although beautifully produced, the Muppet-related movie, *The Dark Crystal*, left some of its audience wondering, "So what?"

There wasn't a lot of substance—at least, not that was developed.

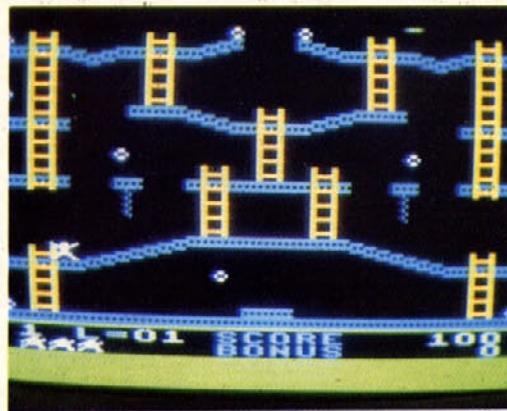
The adventure escapes such denigration by virtue of being a game. As puzzles, the tribulations of the gelflings Jen and Kira are challenging, and solving them is rewarding. That is the "so what." And, because graphic adventures are so often weak in plot, the thin story that failed to serve the movie well is comparatively top-drawer material in the game.

Having seen the movie is a help in solving the adventure, mostly because you know the goal and what's supposed to happen where. You know what to look for. That doesn't mean you know how to get it. Solving the puzzles you recognize is only a bit easier, and Williams has cleverly added some you won't recognize at all.

Even so, *The Dark Crystal* is an intermediate-level adventure; except for the possibility of hanging up on a few less logical puzzles, advanced adventurers can solve this one in a couple of evenings.

Stylized graphics, very faithful to the film, make the game delightful even when it isn't very hard. Henson Associates's Jim Mahon chose unique ways to use color in a sketch-type painterly style that gives greater depth and more variation to the scenes than most other adventures have achieved.

Finally, do you always clap for Tinkerbell when you watch *Peter Pan*? (This reviewer still does—even after many years.) Then you are just the kind of person *The Dark Crystal* will appeal to most. But you'll have to *not* clap for Tinkerbell. Odd, isn't it? MCT Apple II, II Plus, IIe; 48K. \$39.95 from Sierra On-Line, Sierra On-Line Building, Coarsegold, CA 93614; (209) 683-6858.



Jumpman

By Randy Glover.
Jumpman is a good game.

Never mind that it's from Epyx/Automated Simulations, the same company that introduced such questionable programs as *Alien Garden*, *Platter-Mania*, and *Monster Maze* (whether they were games or not is a moot point). *Jumpman* brings to arcade games the same high quality that Epyx introduced to fantasy role-playing with its *Dunjonquest* series years ago.

At first glance you might think the game is a rip-off of *Miner 2049er*. It has ladders just like *Miner*; it has lots of variation, just like *Miner*; it requires jumping skills, just like *Miner*. And, just like *Miner*, it's a fun game.

Now, the differences. *Jumpman* offers eight playing speeds and thirty—count 'em, thirty—different screens. All different. Not one screen faster and harder each time; not ten screens three times; but thirty screens, one at a time. Fortunately, you don't have to complete them all in order; *Jumpman* lets you jump around from one group to another.

There are five levels of play: beginner, intermediate, advanced, the Grand Loop, and random. Beginner puts you in screens one through eight only (easy now); intermediate lets you play nine through eighteen (look out!); and advanced takes you to nineteen through thirty (*hell!*). At the completion of the highest level of each difficulty, the game ends, regardless of how many Jumpmen you have left over. You've won.

In case you're feeling invincible, the Grand Loop lets you go from one through thirty without any break. And for risk takers, the Randomizer chooses screens at random for you to conquer.

The plot is standard-issue. Alienators have sabotaged Jupiter headquarters, and you, equipped with special Astro Boy boots, are the only one who can defuse the saboteurs' bombs and restore communications systems.

Despite its thin story line, *Jumpman* truly lives up to Epyx's slogan, "Computer games thinkers play." Thinking isn't an option—it's a requirement. However, thinking doesn't guarantee success. You also have to be right on target with your jumps, climbs, and dodges.

One thing that makes *Jumpman* such a wonderfully addicting game is that it forces you to learn. On most screens, grabbing certain bombs causes girders, ropes, and parts of ladders to disappear. Only with experience can you tell which ones do and which ones don't. The result is that some parts of the building become harder and sometimes impossible to get to, and often grabbing the right bomb at the wrong time means death.

Epyx understands this and gives you seven Jumpmen to work with. You'll need them, too, especially at the higher levels, where the name of the game is "try it and see what happens."

When you see *Jumpman* on the computer store rack, disregard the silly art on the box, forget about *Monster Maze* and *Alien Garden*, and ask to see a demo of the game. But go early in the day. You don't want to hear the salesperson announce, "Get outta here, we're closing," just as you're about to master level twenty.

The hardest things *Jumpman* has to overcome are the reputation set by its predecessors and the connotations of its publisher's name in the arcade market. Once past those obstacles, it's bound to be a hit.

MTY Atari 400, 800, or 1200; 32K, disk; Commodore 64; joystick required. \$39.95 from Epyx/Automated Simulations, 1043 Kiel Court, Sunnyvale, CA 94086; (408) 745-0700.

Guest reviewer this issue is Derrick Bang.

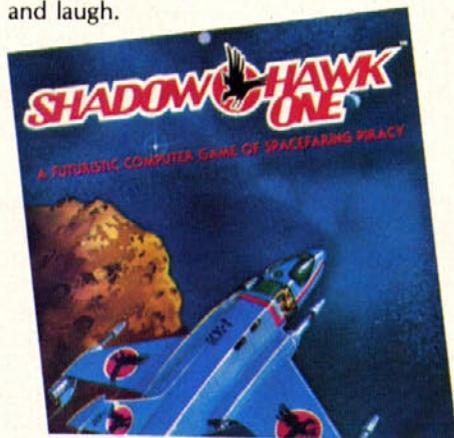
SL

INFOMANIA

not info... ...but an incredible simulation!

HAPPY BIRTHDAY BABY-

The video game is celebrating its twenty-fifth birthday this year. Quietly. Unbeknownst to most, the art form of the twenty-first century was actually born back in 1958 at Brookhaven National Laboratory, Long Island, as the unplanned child of one Willie Higgenbottom. True story. Dr. Higgenbottom was a scientist who wanted to do something to jazz up the rather staid public tours conducted at Brookhaven. He put a five-inch oscilloscope in a box with a button and a knob on the front and programmed a little tennis game for it. It was installed in the gym and became the most popular feature of the tour, drawing crowds for several years before it was dismantled. Higgenbottom never patented it. Someday, he'll look back on those days and laugh.



DOG ETC.

As an addendum to the Dog of the Year poll results reported in the March issue, the programmer of *Shadowhawk One* called to say he was flattered that his game gained so much attention (number 8 on the Atari Dogs list). Terming *Shadowhawk* "a piece of shaving cream ahead of its time," he nevertheless wished to point out that most of the votes were probably for his Apple version. The Atari version came later and "was much better."

Nobody Leave This Room!

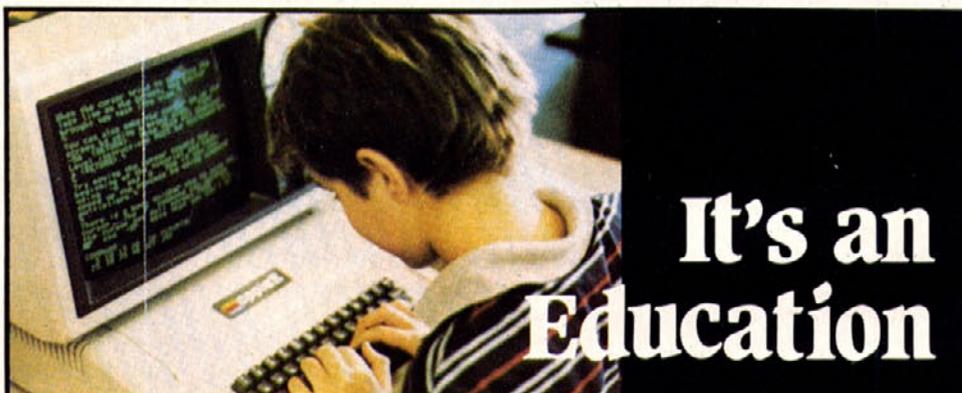
Hitler's Diary: Among the most alarming revelations of the recently discovered diary of German dictator Adolf Hitler was the discovery of an advanced technological elite that had already invented and perfected microcomputerlike games several years before the end of World War II. Among Hitler's favorites were *London Raiders*, *Fortress Wolfenstein*, *Miner Kampf*, and *Alien Blitzkrieg*. (In the latter arcade-style game, Aryan soldiers attempt to fend off waves of Polish pianists and Czech chess masters. This was a personal favorite of Hitler's, even though he was never able to master the third level: fending off cigar-chomping historians.)

Hitler's later mental deterioration can now be clearly traced to the destruction of

the plans for a new educational game, *Der Fuhrer's Face*, during a Berlin bombing raid in March of 1945. Desolate, he retreated for weeks at a time to his bunker, where even such formerly engrossing pastimes as *Patton Lander*, wherein the American general overshoots German lines and destroys Moscow, failed to brighten his existence.

"Am devastated," wrote Hitler at this time. "Goering has beaten my high score. Cannot master strategy for third level or break the protection. All is lost."

The games were played on huge, Babagelike machines in real time. Destruction of the last machine, and its plans along with it, is now revealed to be the cause of Hitler's suicide.



It's an Education

Scholastic demonstrates how to use a different word processor while the teacher isn't looking.

Scholastic is the last company you'd expect to find in the business of misleading and deceptive advertising. After all, isn't a reputable educational company supposed to be teaching our youth the morals and ethics of honesty and clean living?

Scholastic sent out advertising packets last month to educators across this great land of ours, pushing its latest product, the *Bank Street Writer* word processor (also marketed by those inveterate gamers at Broderbund Software).

It's a fine program, perfect for getting youngsters started in word processing, and the pamphlet inside the packet is very attractive and well put together. It's so well done, in fact, that it makes the *Bank Street Writer* look like a different word proc-

essor that costs almost twice as much. By George, it is a different word processor!

Yes, sports fans, that's Sierra On-Line's *Screen Writer II* that the little tyke in the picture is using. And, yes, that's also the on-disk tutorial for *Screen Writer II* he's trudging through.

The offer reads, "Our thirty-day evaluation offer: The *Bank Street Writer* will be shipped to you on a thirty-day-evaluation basis. That means that you may use the program with your students for as long as thirty days." We suppose what that implies is, "If you cannot, for any reason, make the *Bank Street Writer* look, function, and behave like *Screen Writer II*, simply return the program for a complete refund and Sierra On-Line's address."



WELCOME
TO THE
GAMEMASTER'S
MANSION

BB Guys

GameMaster is giving away certificates worth three hours of time on the GameMaster modem game system. There will be one drawing per week, which you can enter by calling up the GameMaster ABBS at (312) 328-9009 (modem) and leaving your name and address.

If you win, one of the things you'll be able to do with your free three hours is compete in a five-player real-time simulation version of Voyager Software's *Starship Commander*, the graphics for which will be used as the first hi-res driver for the Apple II and later (hopefully) for the Commodore and Atari.

Also on-line will be *Empyrean Challenge*, courtesy of Superior Simulations, a science-fiction simulation for 20 to 150 players. Not for beginners.

Eastern B-board. Video Fantasies, an electronic bulletin board for Apple, IBM, Atari, TRS-80, and Commodore users, is now on-line twenty-four hours a day. Members can post and read messages, electronic mail, and software/hardware reviews; perform software downloading; and play in contests. (*Wizardry* is May's prize.) Membership is available by calling (215) 363-0563 via modem. It's operated by Vince Carahaly, a high school student in Exton, Pennsylvania.

Commodore Moves! Hard on the news of Atari's relocation of its computer manufacturing division to the Far East, it has been learned that Commodore Business Machines is deserting its digs in Wayne, Pennsylvania, picking up the whole shebang and putting it down somewhere else. Henceforth, the little white-and-tan computers will be coming out of 1200 Wilson Drive, West Chester, PA 19380. The company's consolidating three different facilities into one larger building and is probably still unpacking boxes as you read this, so it would be cool if you wanted to send some housewarming cookies or fudge or the uncorrected ROM chip or users' manual from your original Commodore 64.

Sports Roundup

The big story in the sports world—golf! Here's how it went:

December 20, 1982. Brainstorm strikes. What's needed to keep the microcomputer games industry healthy is to get companies to stop competing against one another in hostile ways and start competing in not-so-hostile ways. As the communications center of this industry, *Softalk* decides to throw the First Annual *Softalk* Summer Celebrity Invitational Miniature Golf Classic '83. It's to take place in June 1983.

December 21. Problems arise. Who the hell is going to be in California, the site of the tournament, in June? No one. The date has to change; it's set for Thursday, April 14, the day before the Anaheim Applefest. Invitations are printed, phone calls are made, and bar mitzvahs are rescheduled.

January 12. The Classic is canceled. The invitations are mistaken for note paper and wind up with messages from Richard Attenborough, George Steinbrenner, and Brent Shaw written all over them. *Softalk* is too broke to have any more printed.

February 23. After numerous phone calls, the Classic is rescheduled for April 18, the day after Applefest. Atari gets mad because it's too far from Hong Kong; Apple gets mad because it's not invited; Commodore gets mad just for the sake of getting mad. R.S.V.P.s start rolling in.

April 15. The first day of Applefest. The whole thing is off again because of disputes among Broderbund, DataMost, Sierra On-Line, and Sirius. Each refuses to be seen on the same miniature golf course as the others, so they all stay home and pout. Sierra On-Line finally capitulates and sneaks a golfer into the Classic while the other companies are frantically working on their taxes. *Softalk* loses credibility, and *Softline* picks up the administrative duties.

April 15 again. *Softline* reschedules the Classic for Saturday, April 16, at Golf 'n' Stuff, after the show closes for the day. Participants include golfers from Southwestern Data Systems, Artsci, Top-Notch Productions, Penguin Software, H.A.L. Labs, Sweet Micro Systems, Gibson Labs, *Nibble*, and some guy from Adventureland (Fantasyland was closed). The Classic finally becomes a reality.

First to tee off was Roger "Just Point Me in the Right Direction" Wagner (SDS), who looked more like an uncoordinated reject from *Fame* than a golfer. Brian "Not So Amazing" Fitzgerald (H.A.L. Labs; 3-D Maze Guy) and friends teed off next, and Dave Szetela (*Nibble*) was teed off the whole evening.

The only casualties of the evening were Sweet Micro Systems's Nick "Mockingboard" Kondon and Penguin prez Mark "I'll Do Anything for Laughs" Pelczarski. Both, just a couple of kidding-around kinda guys, wound up trying to show the other what the water traps and ponds aren't for—swimming. But it looked more like Saturday Night Wrestling than two birds in a bath.

Do They Play Golf in the Antarctic? Apparently so. Penguin was represented by six golfers (H.A.L. Labs led the population explosion with seven) and ran away with all the top honors. In the women's division, it was Penguin's Holly Thomason who finished first with a nine-over-par sixty-one to win the Dinah Shore award.

Thomason was a gracious winner, even though she spent the better part of the day bitching and moaning about how she'd rather go to Disneyland that evening to celebrate her birthday.

Penguin also dominated the men's di-



vision with a one-two finish. Marketing director Dave "Gimme a Brew" Albert shot a sizzling five-under-par forty-seven, and Eagle "Pie Man" Berns took the runner-up position with a forty-eight.

Thomason and Berns were also on the winning foursome, along with free-lance programmer Wayne Garris and *Softalk*'s David "What a Guy" Durkee. The team's composite score totaled 227, just two putts ahead of Will Clardy (Sierra On-Line) and some H.A.L. Labs groupies.

The Kellogg Award for the biggest flake goes to Top-Notch Productions. Alan "Pollywog" Wootton, perhaps the one most excited about the tournament, chickened out at the last moment, claiming to be "too tired." Must have been all that lores algae for lunch. Top-Notch was represented, though—if you can call it that. Joe "He's Alan, I'm Not" Wootton and Ed "No Nickname" Miller embarrassed the company with horrible scores of sixty-six and seventy-one respectively. Practice, guys. Practice.



Holy Computer!

The computer Bible wars are heating up this month with the introduction of *Family Bible Fun* from HomeComputer Software of Sunnyvale. Understandably unaware of having been beaten to the market by Davka Corp.'s *Jericho* and *Bible Baseball*, HomeComputer pitched *The Story of David*, *Great Men and Women of the Bible*, *The Life of Christ (Parts I and II)*, *Book of Prophets*, and *Patriarchs* as "the first home computer Bible games" when introducing them at the Anaheim Applefest March 15. The programs are available for both Apple and Atari from Sparrow Distribution of Canoga Park, California, and feature word puzzles, guessing games, multiple choice, and matching quizzes. They were developed by Dan Shafer of HCS "to counter the alarming trend of computer games featuring violence and prurient subjects."

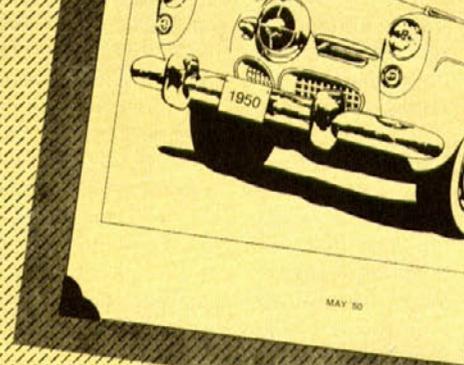
Magazine Watch

Peripherals, Etc. will be keeping everyone up-to-date on the micro hardware situation when it debuts this July. The Gemac Corporation publication is aimed at folks who want to expand or upgrade their current systems and will feature a user group bulletin board, book reviews, and hardware/application tips from readers. Each issue will center on a series of in-depth hardware reviews in selected categories, starting with floppy and hard disks, drives, controllers, and "diskette accessories" in the premier issue.

The Children's Television Workshop steps in this fall with *Enter*, a monthly for "ten to sixteen-year-old computer buffs." It will be the first CTW publication to accept advertising. "Editorial will be of the same high quality that characterizes CTW's other children's magazines and its educational TV series," says editor Ira Wolfman. "Despite the fact that children and teenagers are among the most avid users of computers and computer games, there is nothing on the market edited expressly for them."

Meanwhile, *Softline* is reportedly continuing with its plans for an educational TV series to fill the void that currently exists in that area.

Backward In Time Zone



Thank goodness Sierra On-Line is in the software business and not the party-organizing business.

You see, the hi-res adventure people out in Coarsegold, California, were three years old this month, and they were ready to celebrate. Sort of.

"Hey bud, let's parrrry!" was the cry. Invitations were sent out, reservations made

at the Oakhurst Community Center, hors d'oeuvres prepared, and dance contests scheduled.

Out-of-town guests (how many guests were from *in-town*?) were housed at the Rustic Pines Lodge (with Nick Needles appearing at the piano bar?), right across from the A&W.

Partygoers decorated themselves in the latest of new-wave fashions—bobby socks, bowling shirts, pompadours, and shark-skin jackets; you know, the stuff most likely seen at a Stray Cats concert. Unfortunately, Sierra On-Line's intent was a fifties theme.

"But wait a minute," you're thinking. "Wasn't the theme for last year's party the sixties?"

Damn right.

Why, that would mean by 1990 the theme would be . . . nawww.

And wait, there's more! Not only are Ken and Roberta and company regressing in time (perhaps inspiration for *Time Zone II*), but their timing left lots to be desired. One party animal who didn't attend the soiree was Gerry Milden. He kind of held his own party that evening. A three-day party in Boston. Called Applefest.

Oh, well. Maybe all this confusion was the result of Sierra On-Line's choice of party date. It was May 13. Friday.

The CompuPlus News
 A SPECIAL EDITION FOR PRODUX 2000
Kerness Goes Crazy!!
 President of CompuPlus Lowers Prices Beyond Belief!!



Conry T. Kerness, president of Mind Games, the new company responsible for the *Desecration* adventure-cade game, has formed a product submission department to handle the "large influx of programs sent to Mind Games for review," says president Gil Beyda. The unexpected volume of author submissions is attributed to "word of mouth" concerning Mind Games's policy of "complete freedom to create, in addition to one of the most equitable royalty compensation agreements in the industry." (Heck, they're getting calls from Boy Scout troops due to the former association of the founders with the BSA.)

Apple II Plus w/48K
 List \$1530
 Our Price **\$979**



BOOM & BUST

Such a deal! If you had acted before March 16, you could have bought an Apple IIe from CompuPlus of Van Nuys, California, "on order," at a fabulous discount. More than four hundred people did. Then they noticed that time was passing and they weren't getting their Apples. Something was in the air. Customers who had Apples on order called the store and were generally told, "It's coming in tomorrow." Tomorrow never came. CompuPlus closed up shop, cleaned out the stock, and filed for bankruptcy on March 16, this while still running full-page ads in the Los Angeles *Times*, taking orders, and cashing checks the week before. On March 17, a security guard stood outside the offices of parent company Marcey, Inc. All the people who had ordered Apples were instantly turned into creditors.

Crowds gathered at the store. One customer drove down to find out what was what, saw the front door locked but could see employees inside, and went around the back. He was allegedly escorted abruptly off the premises by an employee with a gun. He called the cops, and all the employees shortly found themselves escorted off the premises, including one who was found hiding under a table. No gun was reported found at the scene, however, so police cannot verify the customer's story. They just don't have any clues. None. Nada. Zip. Can't imagine. Really.

Happy ending: CompuPlus has reopened on a limited basis and is selling lots of stuff to brand-new customers. The four hundred folks who bankrolled the company's bankruptcy get to wait two years before they can collect. There's just no pleasing some people.

What Kind of Geek Do You Think I Am?

"He's a well-adjusted teenager who's active socially, enjoys sports, and maintains a grade average of B or above." Presumably, he is also male. He's the average video game player, according to a recent national player study commissioned by Atari. The telephone survey consisted of two thousand interviews with male and female participants between the ages of ten and forty-five. Quota sampling by age was used to assist in obtaining a representative sample. The study dramatically reveals that players are more likely to be involved in "group activities and team sports" and are "doers" (you know—strong white teeth, flashing eyes, dance trophy), while non-

players are interested in "individual activities such as reading" and "might be characterized as observers." (You know—they sit next to the punchbowl at the prom, wear glasses, and cry when you give 'em Indian burns.) The most popular responses players made to queries about other interests included "spending spare time with friends," "working hard," and exploring their "computer interests."

The percentage answering "harassing old people," "disobeying parents," "drug experimentation," and "jimmying Coke machines for spare change" was not reported. Atari's results have not been characterized as "surprising."

Handy Guide for Programmers

Mind Games, the new company responsible for the *Desecration* adventure-cade game, has formed a product submission department to handle the "large influx of programs sent to Mind Games for review," says president Gil Beyda. The unexpected volume of author submissions is attributed to "word of mouth" concerning Mind Games's policy of "complete freedom to create, in addition to one of the most equitable royalty compensation agreements in the industry." (Heck, they're getting calls from Boy Scout troops due to the former association of the founders with

the BSA.) The department will expedite the submission process, reducing response time to authors from two months to two weeks. Inquiries of program submissions should be directed to Mind Games, Program Submission Division, 420 South Beverly Drive, Suite 207, Beverly Hills, CA 90212.

New Game; Rns Gd. Software authors are invited to put their product before the buyers on Programmer Pipeline's electronic listing service. A description of your program can be entered in minutes, and software companies can access the database of program descriptions on a twenty-four-hour basis. If programmers wish, a blind-box service is offered to receive confidential responses. Inquiries should be directed to the company at Box 666, Glendora, CA 91740.

Fake Stuff

Still Another New Atari Computer. In an attempt not only to meet but to crush the competition, Warner Communications has announced another new home computing appliance. Called simply the Atari 800e (E for eclosion), this new computer will offer features previously found only on competitors' more expensive machines. In a stroke of reverse engineering genius, the Atari 800e (code named "Lemon") brings the home computer neophyte into a bold new era of computer design.

One of the features of this new machine is the replacement of only four integrated circuits (GTIA, POKEY, ANTIC, and 6502) with more than eighty MSI circuits to

increase the chip count and help use up some of the excess capabilities of the power supply. In fact, users will now be permitted—nay, required—to install a neat external fan from some aftermarket company in order to prevent the circuit boards from self-destructing.

In addition, a lot of excess features and capabilities were removed from the older Atari 800 design to be more competitive. On the new machine, the reset key was moved closer to the main keyboard so the user would not have to reach as far. Also, the protection for inadvertently pressing this key was removed, making it easier to press.

The special-function keys (Start, Select, and Option) were removed because it was felt that they were too expensive and detracted from the sleek appearance of the computer unit. Finally, the four cursor control keys were reduced to two keys—left

arrow and right arrow—to help give the keyboard that uncluttered look so popular with today's modern computer user.

..All these changes were accompanied by a new suggested list price of only \$1,399. It was explained by Atari marketing execs that this new higher price was more competitive and that Atari would be "silly" not to rely on the tremendous market appeal of the company's name and its long-time presence in the home computer market.

At the recent press conference announcing the computer, Atari representative Alan Loofuoy, eastern region vice president of new product development, also mentioned that the 1200XL "designer computer" will contain an expanded instruction set that will greatly enlarge the power of the 6502 microprocessor.

Acknowledging that the impetus for the new opcodes had come from "heavy users," Loofuoy said that these new codes will satisfy their needs. Listed here are just a few of the new codes announced:



BNR – Branch for No Reason
DPW – Don't let Player Win
EDR – Emit Deadly Radiation
FLR – Flash Lights at Random
GMD – Generate Meaningless Data
ICR – Incur Costly Repair
JIL – Jump to Inaccessible Location
LLI – Lose Last Instruction
POP – Punch Out Programmer

RIS – Remain In Subroutine
TEC – Take Extra time for Calculation

(Thanks to Art Leyenberger and the JACG Newsletter.)

No Calc Is Good Calc. You probably thought the last thing this market needs is another Calc program. Wrong!

Joining the bandwagon is *InvisiCalc* from **CE Software** (801 73rd Street, Des Moines, IA 50312). You have to not be able to see it to believe it.

It's easy to learn, easy to use, and easy to forget. *InvisiCalc* solves your problems in seconds and then lets you guess the answers. At the same time, it eliminates the need for expensive monitors and noisy printers.

While *VisiCalc*, *1-2-3*, *SuperCalc*, and other amateurish programs try to answer that business forecasting question, "What if?" *InvisiCalc* goes one step beyond, asking, "Who gives a damn?" *InvisiCalc*. It's as good as it looks.

New Stuff

Atari: Life as a moth just ain't what it used to be. In *Gypsy*, all you want to do is munch a few leaves. But those darned ants, bees, and spiders have their little hearts set on munching a few gypsy moths. Try to survive long enough to send in your high score. \$26, disk; \$21, cassette. Brought to you by the entomology branch of **Avalon Hill Microcomputer Games**, 4517 Harford Road, Baltimore, MD 21214.

Get your helmet, cape, and Somanizer ray and help save the world from the grumpy Munchies. You're the star in *Captain Cosmo*, the only one who can put the Munchies back in the zoo where they belong. One to four can play at a time, and ten skill levels accommodate the most experienced arcaders. 32K, disk. \$34.95. In the reptilia department, *Adventures of the Baby Sea Turtle* puts you in control of Clyde, a newborn turtle. Help him reach a safe haven, avoiding natural enemies all the while. To add to the excitement, Clyde also wants you to help him seek and mate with Claudia. 48K, disk. \$34.95. Skill and luck are what you need in *Superbowl Football*, a real-time simulation. The game lets you choose your plays and even "lateral" the ball in the middle of a play. Penalties, fumbles, cheering, and jeering are all part of it. Individual statistics are displayed at the end of the game. 48K, disk. \$49.95 or thereabouts. The whole lot is from **Nexa**, Box 26468, San Francisco, CA 94126.

From Program Design: Adventurers can play Eric Babinet's *Star Crystals*, in which the mission is to overpower the defense systems of a distant planet, maneuver your ship through the planet's caverns, and return to Earth with a valuable energy crystal. For one or two players. 16K, cassette; 24K, disk. \$29.95. You'll have to be a real mastermind to do well in *Spy vs. Spy*. The object is to guess a secret word that'll allow entrance to the embassy. The computer tells you how many letters are correct in your guess and how many letters are in the correct place. For one or two players; by Alan "Don't Call Me 'Alfred E.'" Newman. 16K, cassette, \$18.95; 32K, disk, \$23.95. For sailor types, John Bayes's *Clipper: Around the Horn in 1850* challenges you to sail from New York to San Francisco via Cape Horn in record time. It's a strategy game; every decision you make affects your speed. 24K, cassette; 32K, disk. \$29.95. *Android* combines 3-D mazes, earthquakes, and voice feedback into one game. You guide the android through a labyrinth to gather treasures and avoid robot guards and other hazards at the same time. An Atari 410 program recorder is needed for optional voice track. Included is *Captivity*, an

easier, similar game to warm up with. 40K, disk. \$29.95. Line up the class for some educational fun. *Vocabulary Building Games* is a set of four games: In *AstroQuotes*, you guess four words from given clues and then try to guess a famous quotation. Quotes are by famous persons running the gamut from Aristotle to W. C. Fields. *Kross 'N Quotes* scrambles up the letters of a famous quote and makes you figure out what it says. *Minicrossword* creates a puzzle and presents a clue for each word. *Time Bomb* is the computer version of *Hangman*. If you can't guess the word, then it's kaboom! All *Vocabulary Building Games* are 24K. \$16.95, cassette; \$23.95, disk. The whole set of four goes for \$59.95, and you can get them from **Program Design**, 95 East Putnam Avenue, Greenwich, CT 06830.

Combining adventure, strategy, and arcade action into one game for toddlers, Tom "No Relation" Snyder's *In Search of the Most Amazing Thing* encourages children to experiment and discover. Kids learn to negotiate with aliens, not destroy them, in order to accomplish goals. Elliott would have been proud. This one teaches decision-making and organization. **Spinnaker Software**, 215 First Street, Cambridge, MA 02142.

Concentration, concentration. *Matchboxes* exercises the power of recall. The object of the game is to match identical squares and then solve a hidden word puzzle. Just like the morning game show of a different name. Disk. \$29.95. If you missed them on disk, try them on cartridge. Dan "The Man" Gorlin's *Choplifter* and David "Midnight Magic" Snider's *Serpentine* can now be plugged in for 16K play. In *Choplifter*, your duty is to rescue the hostages from the Bungeling Empire and fly them to safety. 16K. \$44.95. *Serpentine* pits you (a snake) against giant serpents in maze action. Lay eggs, grow longer, and eat frogs. Mmmm, mmmm, good. 18K. \$39.95. You'd better polish your knowledge of military strategy if you expect to do well in *Operation Whirlwind*. Commands, movement, combat, and assault are all carried out through your joystick. Take your time; games average three hours. \$34.95. **Broderbund Software**, 1938 Fourth Street, San Rafael, CA 94901.

Though we usually don't come right out and recommend things in this space, we have had a preliminary peek at these next two, and they look, quite frankly, hot. *Archon*, by Free Fall Associates (Freeman, Westfall, and Reiche), is what D&D games would be if they were arcade games—played on a chessboard. Okay? It's light versus darkness in the big game, with lightning bolts, dragon fire, swords, spells, and eye beams. The winner either captures the five power points on the board or defeats all comers on the field of battle. \$40. *M.U.L.E.*, by Ozark Softscape (Bunten, Bunten, Watson, and Rushing), requires interpersonal bargaining between players as they

compete for financial advantage in the exploitation of a frontier planet. The title creature is a funky little masterpiece. Three levels of complexity, fully animated, and the best musical score since *Pollywog*. Strategy and dexterity required. \$40. Both are from **Electronic Arts**, 2755 Campus Drive, San Mateo, CA 94403. The company will have twenty-three additional titles out in 1983, all packaged like oversized 45 records.

Apple: Ever fly an interstellar cloud? Now's your chance in Tom Becklund's *Thunderbombs*. Trapped in the crossfire, your only defense is to dodge and return the fire as fast as you can. You'll look at clouds from both sides now. \$19.95. In Scott "I Am Not a Crook" Schram's *Crime Wave*, your job is to capture bank robbers in the act or before they get back to their hideout. Bird's-eye view lets you plan your strategies, but think fast because there's no stopping for doughnuts in this game. \$19.95. Both games have a Mockingboard speech-and-sound-board option. Flown from the Antarctic by **Penguin Software**, 830 Fourth Avenue, Geneva, IL 60134.

Dental hygiene vigilantes have sabotaged the gumball factory in *Gumball*, and it's up to you to zap the hot ones before they blow you to the great candyland in the sky. Oh, you have to keep up with gumball sorting, too. \$29.95. Another one from **Broderbund Software**, 1938 Fourth Street, San Rafael, CA 94901.

Don't ask why, just do it. Run through different rooms and secure treasures before enemy robots can find and destroy you. Mines cause problems along the way. It all happens in *Robot Frenzy*, from **MicroStand**, 2000 South Holladay, Box 997, Seaside, OR 97138. \$29.95.

As a debut game from Sagebrush Software, *It's the Pits* puts you in charge of Grimpets. Help them stay alive by eating plums while avoiding fiery pits and predatory wirlybats. **Sagebrush Software**, 39 Carriage Place, Urbana, IL 61801. \$29.95.

Commodore 64: Yes! Finally! Games for the new machine. But first: Tinkerers will delight in Sylvia Smith's *The Master Memory Map*, a three-hundred-page guidebook to most memory locations in the computer and their functions. Teaches you which locations control which functions. \$14.95. (For VIC-20, \$9.95; for Atari, \$12.95.) In games, you can get look-alikes of *Berzerk*, *Space Invaders*, and *Tutti Frutti* in Educational Software's user exchange for a low price. The games are *Aliens*, *Survive* (16K, cassette; 32K, disk), and *Robot Attack*. 32K, disk. Three-pack, \$24.95. Steve Robinson's *Digger-bonk* puts you in a continuously scrolling maze that never repeats itself. Guide your digger upward before it gets carried off by menacing aquatic types. Disk. \$29.95. Available from **Educational Software**, 4565 Cherryvale Avenue, Soquel, CA 95073.

In *Monopole*, your goal is to travel around London, buying and selling properties while making as much money as possible. Sound like a familiar board game? It should. \$19.95. *Adventure Pack 1* contains three text adventures: *Moon Base Alpha*, *Big Bad Wolf*, and *Computer Adventure* (gee, how original). All have time limits to make things hard on you. \$19.95. Necromancers can sink their teeth into *Grave Robbers*, a graphic adventure with sound. \$19.95. You can get 'em from **Data Asstette**, 56 South Third Street, Oxford, PA 19363.

If looking at the keyboard is raunching out your game playing royally to the max, the Portable Keyboard might help. It's made of heavy cardboard, and you can take it with you to practice learning keys while away from your machine. Also available for Apple, Atari, TRS-80, TI 99/4, IBM, and others. \$3.95. From **Computer Practice Keyboard**, 616 Ninth Street, Union City, NJ 07087.

New York has mutants. Everywhere. In Joe "Don't Call Me 'George'" Jetson's *Save New York*, you're the defender of good and moral things, and your job is to kill the nasty buggers before they destroy the city. Morality says you shouldn't save New York, but the game dictates otherwise. Cartridge. Also available for VIC-20. \$39.95. Educationally speaking, *Pipes* challenges you to connect all the pipes in the town of garlicky Gilroy to the main water supply. Efficiency is the key. Cartridge. Also for the VIC-20. \$39.95. *Moon-*

dust, by Jaron "Lunar" Lanier, is a fantasy blend of color and music incorporated into a game. Can't be described in words. Cartridge. Also for VIC-20. \$39.95. Conversions from VIC-20 to the 64 include *Trashman* and *Astroblitz*. Both are \$39.95. The games spring forth from **Creative Software**, 230 East Caribbean Drive, Sunnyvale, CA 94086.

VIC-20: *Quackers* takes you to the shooting gallery. *Annihilator* has you defending the humanoids from the clutches of hovering Landers. In *Orbis*, it's your uranium fuel dumps you have to save. *Night-Crawler* drops you in the middle of the Green Forest, where all sorts of strange creatures live. Your mission in *Krell* is to defend the Zymwatts from the evil Tharg by fending off his energy bolts. *Hopper* is, not surprisingly, *Frogger* for the VIC. *Skramble* challenges you to guide your craft through numerous perils. *Alien Soccer* is nothing like Earth's version of the game. *Myriad* (3K expansion) takes you on a journey through space. 'Nuff said? *Tank War* is a two-player game (partner or VIC) in which you get to show off your quick reactions and clever tactics. *Space Storm* is a 3-D version of the arcade game. *Space Phreeks* are what you face when you, as the sole survivor of the Rigellian War, attempt to colonize another planet. All games are \$19.95 on cassette. **Data Asstette**, 56 South Third Street, Oxford, PA 19363.

More cartridges: *Deadly Skies*, by Thomas "Gunner" Kim, is a shoot-'em-up in which you, equipped with five helicopters, are trying to destroy a military base. Look out for ground fire missiles, smart bombs, asteroids, and UFOs. Features thirty-two levels. \$39.95. Corey "I Like Money" Ostman's *Gold Fever!* has you gathering gold while avoiding runaway boxcars, boulders, and greedy claim jumpers. Two alternating mazes and nine skill levels. \$39.95. Jimmy "Baby" Huey's *Scorpion* has you in the title role. You struggle against dragons, frogs, Venus's-flytraps, stalkers, and other nasty critters, all during your fight to survive. Thirty-two levels of play in easy, normal, and hard modes. \$39.95. **Tronix Publishing**, 8295 South La Cienega, Inglewood, CA 90301.

Runners on empty: Joining *Time Runner* and *Lode Runner* is *Gridrunner* (haven't we had enough?). Your mission here is to save Earth from horrible intergalactic space demons. Armed with your plasma cannon, you blast droids, pods, and zappers off the grid. Also for the Commodore 64 and Atari 400/800. Disk. \$39.95. **Human Engineered Software**, 71 Park Lane, Brisbane, CA 94005.

You are a rat, much hated by the maintenance man at the Hotel Paradisio. You have to eat all the cheese on each floor of the hotel while avoiding the maintenance man, rat traps, and black cheese (yech!). Stuff yourself with all the cheese and you can escape through the basement. Accommodations courtesy of the *Rat Hotel*. \$39.95. **Creative Software**, 230 East Caribbean Drive, Sunnyvale, CA 94086.

TRS-80: "Get me outta here" is the name of the game in *Mazeme 3*. Once you escape one maze, you're plopped down in another. And watch out for that damned fireball. \$29.95. *Plutox* is a game of skill that involves maneuvering spaceships and landing them on the spaceport pad. \$29.95. Both are from **Single Source Solution**, 2699 Clayton Road, Concord, CA 94519.

"How's your karma?" is the name of the game in *Above Intelligence*. Twenty-five games, brain teasers, and printer graphics are all packed onto one disk. Check your I.Q., determine how people rate in your life, and play all sorts of thinker's games. For the Model II, 12, and Model 16. \$49.95. **Eberhard Engineering, P.C.**, 27 Pine Ridge Drive, Smithtown, NY 11787.

IBM: *Oil Barons* takes you into the high-stakes world of the international oil market, where wheeling and dealing are the name of the game. Players compete to become the kingpin of the world energy market. Government regulations, windfall taxes, well fires, and hurricanes are among the obstacles you must face. Also available for Apple barons. **Epyx/Automated Simulations**, 1043 Kiel Court, Sunnyvale, CA 94086. \$100. 

Thinking a Program

Part Two

by Sherwin Steffin

In part 1 of this article, we talked about some of the factors that go into the design of a drill-and-practice program to teach simple division skills. We focused in that installment on the steps an instructional designer takes when developing such a program.

As we noted last time, drill-and-practice software is intended for learners who have already mastered a particular concept and now wish to increase their mastery of a specific skill. Let's now center on what's involved in the actual teaching of such a skill. As before, we're assuming that you either have the necessary skills to write the code yourself or can get help in doing so.

The Components of the Tutorial System. Four components are almost universal to effective CAI (Computer-Assisted Instruction) systems. These are a statement of objectives (that is, a statement of the intended learning outcome), a set of strategies intended to help the learner meet these objectives, criterion tests that measure the extent to which learners have achieved the learning objectives, and a record-keeping system that tracks the progress learners make each time they use the system.

Tutorial learning systems of the type we're talking about are fundamentally different from educational games. In an educational game, the player is presented with some goal. That goal, once achieved, can be seen to be internally consistent with the objective of the game, but the learning that takes place (if any) is not made explicit to the player. Lacking a statement of intended learning outcome, the learner is unable to answer the questions, "What am I supposed to learn?" and "How do I know when I've learned it?"

Stating the Learning Objective. Before beginning the actual development of learning strategies, the instructional designer must ask, "What do I want the learner to be able to do after he finishes working with this system?"

In reference to our division skills example, we could specify that we want the learner to be able to handle problems involving basic division facts. We might further state that the learner should be able to do problems that have a single-digit divisor, with a single-digit dividend and no remainder; problems containing a single-digit divisor with a single-digit dividend and an integer remainder; problems that have a single-digit divisor with a dual-digit dividend and no remainder; and so on. This time, let's focus on problems involving a single-digit divisor with a dividend containing from one to three digits and a remainder. Now let's write a sequence of objectives that will guide us in providing appropriate instruction to the learner.

We begin with what is usually referred to as the *terminal objective*—that is, the ultimate ability we want learners to possess when they've finished using the system. Thus, the terminal objective for the program we're designing might read, "Given pencil and paper, a single-digit divisor, and a multidigit dividend, the learner will successfully calculate the correct quotient (and remainder, if any) in 90 percent of the problems presented."

The terminal objective has several components: a specific behavioral task—to calculate the correct quotient (and remainder, if any); conditions under which the learner will be able to engage in the performance—given a pencil and paper, a single-digit divisor, and a multiple-digit dividend; and a criterion for performance—in 90 percent of the problems presented. Stating the tasks, the conditions, and the criterion for performance clarifies the terminal objective and makes it measurable in terms of the expected outcome.

Since most learners who are working with division skills for the first time are eight or nine years old, we need to restate the ter-

minial objective in terms they can understand. We might restate it by saying that when you're finished with this unit, you'll be able to divide any dual-digit number by any single-digit number and find the answer.

Of course, that rephrasing might be very difficult for a learner of this age to understand. The terms single digit and dual digit might not be very meaningful; moreover, the concept of division might really be a mystery. Therefore, we might want to state this final objective this way: "When you get done, you'll be able to do things like this . . ." and then show learners some actual sample problems of the type they'll be able to do when they've finished working with the system. We have thus provided learners with an *advanced organizer*, which means we have helped them know what they're expected to learn and have given them information that will help them prepare themselves to do so.

Strategy Selection. Even a cursory consideration of division reveals a high level of complexity inherent in this task. Before one can do division, a number of skills must be mastered. The learner must gain facility with subtraction and multiplication and acquire the ability to compare a trial product with the dividend and to assess accurately which is larger. These processes may seem trivial to adults, but they may be quite difficult for the eight or nine-year-old child to master.

Since the instructional system we're developing is designed to teach division, we need to pretest learners to determine whether they have the requisite skills we named earlier. If a learner lacks requisite skills, we have two choices. The first is to provide remediation for the missing skill within this instructional system; the second is to say to the learner, "You are not quite ready to learn division. You need to review some of the things you missed on the pretest and get better at doing them before you try this unit." If we take the second option, what we've done, in effect, is to set the requisite entry skills required before asking a learner to attempt to master the new skills being presented.

Now that we've determined the entry level requirements for the unit, the next step is to establish the sequence of instructional events. In doing so, we might set up a sequence resembling this one: the concept of division; division facts with divisors of 1 to 9 and dividends from 2 to 99; the concept of division with remainder; the mechanics of the division process (if you think this isn't sufficiently challenging, think about doing the same for the teaching of square-root derivation and you'll get an idea of how important this aspect of the sequence can be to learners for whom this program is intended).

Having established a sequence we think will help learners reach the terminal objective, we must determine how we're going to present the information we want them to have. There are four distinct methods of presenting information via computer, all of which can overlap. The four are *straight linear*, *linear with learner-controlled branching*, *linear with program-controlled branching*, and *multimodal*.

Linear presentations are those that start at the beginning of a lesson and move forward sequentially to the end. Typically, linear instruction presents information, provides sample problems, tests mastery of the information, goes to new information, presents problems, tests mastery of that information, and so on, until the end of the sequence. A variant of this form presents information, presents new information, presents additional new information, and tests for mastery of all information. This linear sequencing resembles the

kinds of experiences most of us have had throughout our classroom careers. In general, it is the least effective of the techniques just named. In terms of program-writing, however, it is by far the easiest to develop for the computer.

Linear presentation with learner-controlled branching allows learners to go backward and forward in a program or to branch to obtain instruction presented in another way. For example, a learner who is already familiar with the concept of division and knows the single-digit division facts may wish to enter the instructional system at some point other than the beginning; a learner who has moved through the system may wish to review some earlier component of it. Thus, learners proceed through a primary channel of instruction and can select alternative instruction whenever they have difficulty understanding the first presentation. This kind of branching is often called *adjunct branching*.

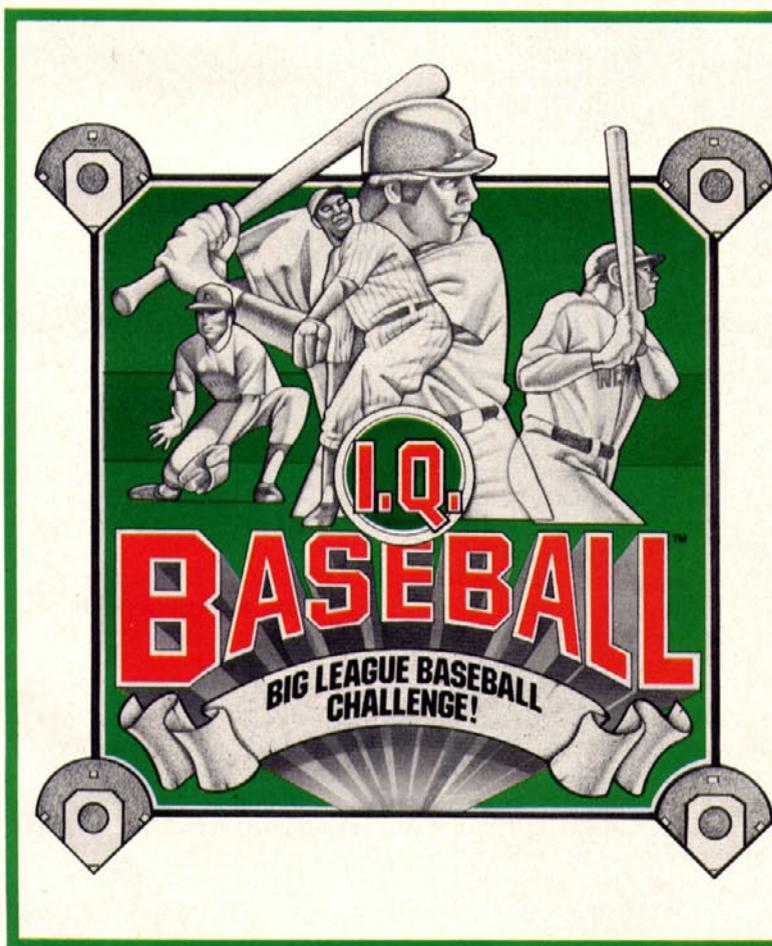
The next level of strategic complexity is program-controlled linear presentation with branching algorithm. In this configuration, the program has a series of diagnostic *on gotos* so that the learner's responses are evaluated and possible problems identified. Based on these responses, the program makes a determination of a particular learner's needs. Implementing this algorithm is not an especially difficult thing for a programmer to do, but using it effectively requires a high degree of sophistication on the part of the program designer. The designer must be able to assess the implications of the learner's errors and to prescribe appropriate remediation through supplementary instruction.

Finally, there is the multimodal presentation algorithm. Instead of presenting concepts sequentially, the programmer puts forth each concept in various ways. Learners are free to select among the various modes and may jump back and forth between them as appropriate to their own learning styles. Some learners find that learning something in several different ways is especially helpful to them. This approach also helps learners discover their most comfortable and productive learning styles.

Criterion Testing. Criterion tests that determine whether a learner has achieved the specified objective are a necessary part of any instructional system. They can be interspersed throughout the program or placed at the end of the unit, and they should precisely correspond to the tasks that have been specified in the learning objectives. Thus, if learners have been told that they can use pencil and paper to solve problems, they should not be asked to work without these tools. And if we're testing learners' ability to find both even quotients and quotients with remainders, then problems of both types should be presented. The key is for the criterion testing to match precisely the intended outcomes of the unit. At the end of testing, learners should be given information about their performances and some idea of where they stand—do they need to study some more or are they ready to move on to the next unit.

The Record-Keeping System. How complex the record-keeping aspect of your system becomes is determined by the degree of detail you want to be able to go into concerning learners' performance. You may want more than one learner to be able to use this system, and you may want to be able to evaluate individual learners' performances over time (multiple sessions on the system). You may also want to set things up so that you can examine a learner's performance with respect to each section of the presentation and look at the kinds of errors that were made in the course of the session. By comparing one learner's errors with similar kinds of errors from other learners you can assess the effectiveness of each frame of instruction.

In this article, we've extended the thinking that goes into the creation of a drill-and-practice program. We've looked at the kinds of variables that must be considered in the development of a tutorial system for the teaching of a given concept. We've also identified objectives, strategies of instruction, criterion testing, and a record-keeping system as fundamental attributes of any tutorial. And we have further indicated that the presence of all these features is what distinguishes the tutorial from the educational game. SL



The logo for 'I.Q. Baseball' is framed by a green border with four baseball caps at the corners. It features a central illustration of a baseball player in a batting stance, with a pitcher and a catcher in the background. The text 'I.Q.' is in a circular emblem, 'BASEBALL' is in large red letters, and 'BIG LEAGUE BASEBALL CHALLENGE!' is on a banner below.

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PENSATE

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? →



How Does a Chicken Cross the Board?

We've done in the invaders, we've gammoned our machines, we've trekked through the stars, we've got dots up the wahzoo, we've go-doored through pretty adventures, and we've hopped and leaped and run dry the mines. Next, please?

Think. Some of the foremost thinkers in the game biz think it's time to think. Arcades, they suggest, won't go away, but they're ready to leave the driving to something else. That something has been around for thousands of years, and there are plenty of computer renditions—chess, checkers, go; even gin and cribbage. They are the foundation of all gaming—the classics you keep around and go back to year after year.

Now, a few very clever, forward-looking people have begun to develop classic-type games on computers—not rehashes of the old games but brand-new ones that require and depend on and take advantage of the capabilities of the computer.

Pensate, an unpublished game by John Besnard, is such a game. The object is simple: to get your piece from the bottom of the board to the top. You even get to choose where to start. Easy? Don't count on it.

The soreheads on the *Softline* cover are arguing over where to

start in a game of *Pensate*. The situation causing the hassle is reproduced here. If you can determine the proper starting position and set of moves to get safely to the top of the board, you can win \$200 worth of products from *Softline* advertisers and \$100 in cash. Ties go to the famous *Softline* RNG (that means the winner gets picked out of a hat, so to speak).

Rules. The rules are the rules of *Pensate*, except for the numbers shown on the computer's pieces. Those numbers represent the sequence in which the pieces always move after you take a turn. In the real game, you have to figure that out for yourself.

1. You must choose one of the squares on the bottom row of the board in which to place your piece to begin. You must place it on an empty square (don't worry about the big numbers, which go away after you choose a start), and you get to move first.

2. You can move horizontally and vertically but *never* diagonally. You can land on a square any number of times, which means you can double back, for example. But you cannot pass and stay on a square (except by moving into an edge—see rule 6).

3. You must choose a path of moves to reach the top row of the board without landing on any computer piece and without any

computer piece landing on you. You are safe as soon as you reach the top row; since you move first each turn, you need not worry about other pieces' moves on the turn in which you'll reach your goal.

4. The computer pieces normally move one square per turn, but they stop only on empty squares. If the square a piece should move to is occupied, it will take another move, according to its pattern; it will continue this way until it reaches an unoccupied square—or until it lands on you. So a piece that goes right may actually move six squares right in one turn if the five squares to the right of its starting place are occupied.

5. The computer pieces that look different move differently. Each has its own pattern, many of which vary according to the way you move. The figure shows the pieces and how each one moves. The horseheads move in the same pattern as knights in chess.

6. The computer pieces wrap around the board—when they go off one edge, they reappear on the opposite edge in the place appropriate to their move. In a few cases, with diagonal movers, the appropriate move wraps them to an edge other than the opposite one. But it's all logical. They always follow their patterns.

7. You *cannot* wrap around. If you try to move off the side or bottom of the board, your piece will try to move but will stay in the same place. Your attempt will count as a move, however, and all the computer pieces will take their turns as if you had moved in the direction of the edge that stopped you. You can sometimes use this to your advantage.

8. Draw your pattern of moves, numbered, on a facsimile of the *Pensate* board, write a summary of your moves (starting box 4, N, N, E, S, N, W, N, N, E, E, N—for example) with your name and address on it, and mail it to Softline Think, Box 60, North Hollywood, CA 91603. Postmark deadline: June 15.

The contest screen is taken from tournament skill level 9 of *Pensate*, several play settings beyond what you can choose as an option. In other words, some bozo actually played this level to get it to this juicy point. The real *Pensate* has many easier levels to learn and practice on. But, of course, you have some advantages: You know the sequence of computer moves and you don't have someone pushing you to hurry so they can play *Choplifter*.

So try it, it's fun. Good luck.

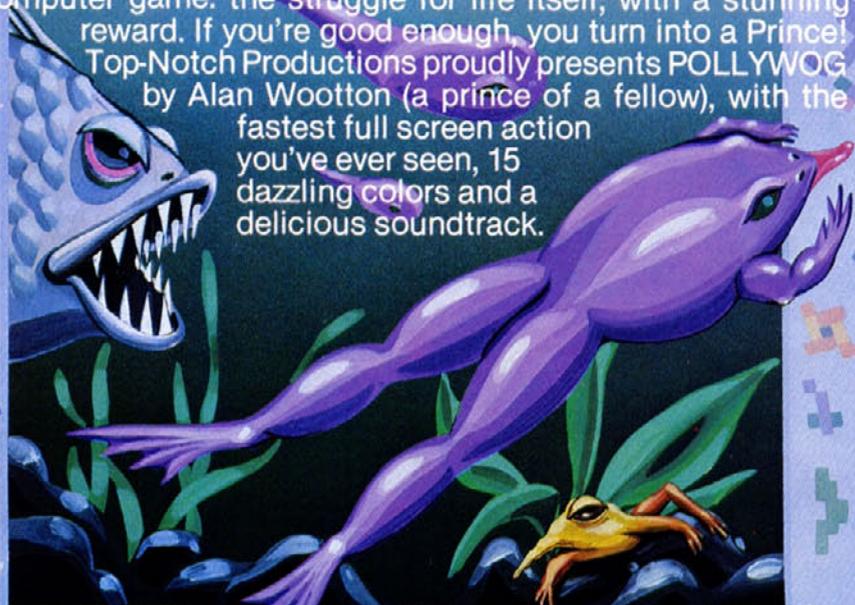
COMPUTER PIECE	YOU MOVE	PIECE MOVES	COMPUTER PIECE	YOU MOVE	PIECE MOVES
	NORTH SOUTH EAST WEST	EAST EAST EAST EAST		NORTH SOUTH EAST WEST	SOUTH NORTH WEST EAST
	NORTH SOUTH EAST WEST	WEST WEST WEST WEST		NORTH SOUTH EAST WEST	SOUTHWEST NORTHEAST NORTHWEST SOUTHEAST
	NORTH SOUTH EAST WEST	NORTH NORTH NORTH NORTH		NORTH SOUTH EAST WEST	NORTHEAST SOUTHWEST SOUTHEAST NORTHWEST
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Since the planning of this contest, *Pensate* has found a home and a publisher in Antarctica.

51

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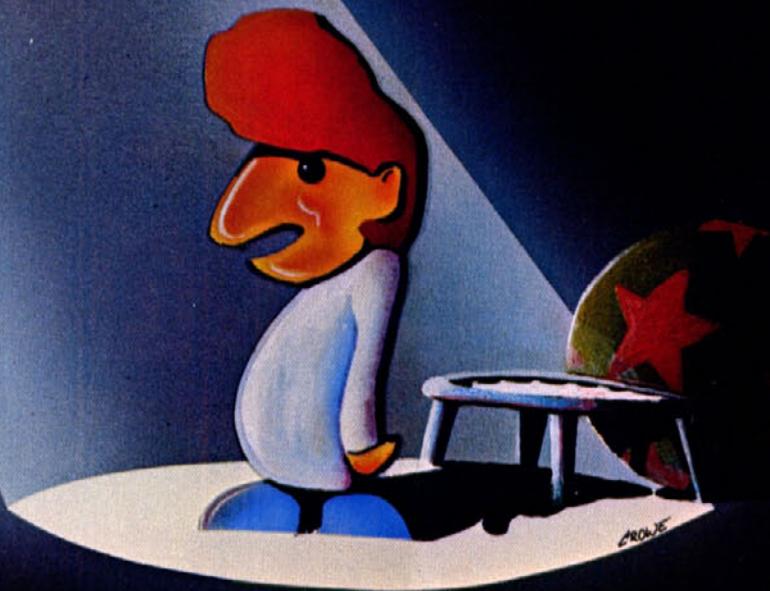
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HIGH SCORES

Highlines

Scores can be accepted only when accompanied by the following: Your name and full address, the name of the company that manufactures the game, your make of computer, and the level of difficulty on which the score was achieved, where applicable.

An asterisk indicates a verified high score and is bestowed only when said score is accompanied by the legal signature of a witness.

Send your high scores to High Scores, Softline, Box 60, North Hollywood, CA 91603. It would be appreciated if you could jot down the game name(s) and scores in a corner of the envelope.

Next high-score deadline: 9:00 p.m. EST, June 7.

Yes, we all got a kick out of seeing **Norman Fong** back for a surprise cameo appearance last time out. Our database got nostalgic. Glad you enjoyed it.

And it seems **Brent Shaw** was unwise to draw all that attention to himself. Some folks, like **John Ferguson**, went back to check out the cause of it all, Brent's *International Grand Prix* score, and did strongly protest. John tried out all five courses, "and I am still far from even halfway through. How Brent Shaw managed to finish the course in thirty-three seconds I'd like to hear him explain." Well, truth to tell, we don't hear as much from Brent as we used to, but, in his defense, game author **Richard Orban** says that if you put a lot of skid on it (0 to 5), you can get through the turns faster. Point is, Brent didn't name the level he scored on, thus the brief life of his score. An object lesson.

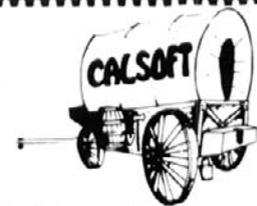
Rich Hofmann reports offspring **Richie** and **Taffy** were "outraged" that he wouldn't let them send in their score on *Autobahn*, once he found out that the car just phases through objects in the middle of the road. Most mysterious. We suggest you straighten this out with Sirius and report back.

Teener **Kevin Lightner** challenges our verification requirement, saying that asking for a reliable witness is "as good as asking for a witness from Venus." Not only does this betray a soured cynicism, so unbecoming in one so young, but it fails to take into account the psychology of score cheating: It's only attractive when it presents a sufficiently complex and dangerous challenge. The greater lengths you can go to to make it look more real, the more illicit excitement it produces. Now check this out, Kevin: the high score for *Snake* (on a Heath 89!), submitted by **D. Picken** on behalf of his son, **John Picken**. "It would have been no problem for me to go into the score file and

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Game/Publisher Score Player

Guardian , Continental	*128,180	Tom McDonald, Huntsville, AL
Hazard Run , Artworx	*131,210	David Schlater, Metairie, LA
Heli-Lifter , Cload	*31,895	Chris Athanas, Topsham, ME
High Orbit , Gebelli	*28,860	Gilbert Huang, Stony Brook, NY
Horizon V , Gebelli	*100,005	George De La Mater, Traverse City, MI
Human Fly , CPU	*154	James Handy, West Chester, PA
Hungry Boy , California Pacific	*43,770	Mike Williams, Lansdale, PA
Hyper Head On , Star Craft	*85,890	Bob Elvey, Grand Rapids, MI
Intruder Alert , Dynacomp	Level 4/*4,584	Dan Perrigan, Norwalk, CA
Invasion Force , Computings	*79,760	Jeff James, Naragansett, RI
It's the Pits , Sage Brush Software	*40,430	Al Tommervik, North Hollywood, CA
Jawbreaker II (Apple), Sierra On-Line	*536,790	Amy Hollister, Shelburne, VT
Jellyfish , Sirius	*361,050	Clark Alyea, Bloomington, IN
Journey to the Planets , JV Software	4,205	Ron Stanley, San Leandro, CA
Jovian , Computer Shack	*28,650	Neil Kincaid, Topsham, ME
Juggler , IDSI	*961,460	John Osborne, Menlo Park, CA
Jumpman , Epyx	*18,110	Frank Ocel, Pittsburgh, PA
Kamikaze , Hayden	*207,125	Jason Meggs, Bethesda, MD
Kayos , Computer Magic	*51,460	Randy Feldman, Brooklyn Park, MN
Kid Grid , Tronix	*33,860	Bobby Moy, New York, NY
K-Razy Antiks , CBS	246,000	Kevin Moore, Dallas, TX
K-Razy Kritters , CBS	*178,600	Bobby Moy, New York, NY
K-Razy Shoot-out , CBS	35,270	Daniel Rosman, Seattle, WA
Labyrinth , Broderbund	*210,490	Kay Chen, Newtown, PA
Laf Pak: Apple Zap , Sierra On-Line	*44,025	David Duplantis, Bloomington, IN
Laf Pak: Creepy Corridors , Sierra On-Line	*9,740	Wilbur Luo, Walnut Creek, CA
Laf Pak: Mine Sweep , Sierra On-Line	7,751	David Duplantis, Bloomington, IN
Laf Pak: Space Race , Sierra On-Line	*14,500	Steve Rothenberg, Mayfield Heights, OH
Laser Maze , Avant-Garde	*87,083	Mike Elliott, Muncie, IN
Lazer Silk , Gebelli	*896,550	Gilbert Huang, Stony Brook, NY
Leaper , Cedar Software	*12,400	Travis Beauboin, Topsham, ME
Lemmings , Sirius	*143,435	Jerry Ingram, Drayton Plains, MI
Lunar Leeper , Sierra On-Line	*106,000	Chris MacChesney, Fresno, CA
Marauder , Sierra On-Line	Level 2/*290,700	Frank Ocel, Pittsburgh, PA
Mars Cars , DataMost	Level 28/*59,080	Bill Niemczura, Willingboro, NY
Megalegs , Megasoftware	*16,192	Michael Little, Catonsville, MD
Meteor Mission Two , Big Five	*100,780	Mike Bolduan, Lake Oswego, OR
Microbe , Synergistic	*10,530	Buell Hollister III, Shelburne, VT
Microwave , Cavalier	*25,609	Christian Juhring, Carmel, CA
Miner 2049er (Apple), Micro Fun	*615,310	Gary Schmitt, Wheaton, IL
Miner 2049er (Atari), Big Five	Zone 4, Station 10/*213,755	Eli Heitmanek, Elmhurst, IL
Missile Defense , Sierra On-Line	429,000	Bruce Schlickbernd, Westminster, CA
Money Muncher , DataMost	*657	David Yuchiemiuk, Philadelphia, PA
Monster Mash , Software Farm	*207,768	Jim Stockla, Shelton, CT
Mouskattack (Atari), Sierra On-Line	240,100	Jeff Conner, Hingham, MA
Nautilus , Synapse	(1 Player) *127,500	Dan Perrigan, Norwalk, CA
Neptune , Gebelli	31,820	Mike Mariant, Santa Clara, CA
Night Falls , Omega	Level 1/*36	Steven Schwartz, Pittsburgh, PA
Nightmare Gallery , Synergistic	*225,575	Clark Alyea, Bloomington, IN
Night Mission Pinball , SubLogic	*749,653,240	Eric Gustafson, Eugene, OR
Odyssey , Synergistic	692,100	Jason Meggs, Bethesda, MD
Outpost , Sirius	*31,267	Charles Destremes, Whitinsville, MA
Pacific Coast Highway (Atari), Datasoft	*146,940	Keith Babcock, Brockton, MA
Pac-Man , Atari	422,860	King Mon Yee, Boston, MA
Paddle Pinball , Radio Shack	*215,010	Chris Athanas, Topsham, ME
Pandora's Box , DataMost	3,125	Theodore Chen, Potomac, MD
Peeping Tom , Micro Lab	17,900	Curtis Rae, Woodside, CA
Pegasus II , Sierra On-Line	*295,840	Joel Frickhoeffer, Statesville, NC
Penetrator , Melbourne House	*15,810	Chris Athanas, Topsham, ME
People Pong , Unique Software	*18,925	Klaus Liebold, Poway, CA
Pest Patrol , Sierra On-Line	Level 29/*10,003	Brian Strand, Poland, IN
Phaser Fire , DataMost	*7,045	Christopher Chan, Trenton, NJ
Phobos , APX	*172,200	Bobby Moy, New York, NY
Photar , Softape	*108,236	Mike Novak, Jr., Decatur, IL
Picnic Paranoia , Synapse	*144,360	Jonathan Hopwood, Glastonbury, CT
Pie Man , Penguin	*60	Kevin Rehak, Woodland Hills, CA
Plattermania , Epyx	*241,022	Bobby Moy, New York, NY
Pogoman , Computer Magic	*452,014	Bobby Moy, New York, NY
Pollywog , Top Notch	*294,765	Matt Yuen, Van Nuys, CA
Preppie , Adventure Int'l	*29,360	Martin Rose, Ann Arbor, MI
Protector , Synapse	63,000	Rob Hammond, East Greenwich, RI
Qix , Atari	*99,044	Margot Tommervik, North Hollywood, CA

change anything I wanted to change," says D.P. "For this reason, I am not sending you a photo of the screen, or even a memory dump, because I could have fixed them. Instead, I am asking you to take the word of a father that his son has in fact achieved the score noted above."

Isn't that what it's all about?

Nevertheless, **Devon Tuck** would like to point out that **Arthur Patryk** could not have gotten 10,035 in *Teleport*, because the point values only increase in values of fifty, minimum. "Gotcha, Arthur," says Devon. **Chris Athanas** would like to know how **Leonard Marinaccio**, coincidentally the winner of the Maze-Out this issue, got 425,620 on *Attack Force*. **Rod Bonios** and several others think it's time to get tough with **Terry Rora**, "Mr. Joe Atari Supergamer, of course. His name is listed for eight high scores, all unverified. Mr. Rora, if you're a hermit, I apologize. But if you're not, I just can't believe that you couldn't get one itsy-bitsy score verified. Not that your scores are terribly outrageous, but c'mon, be fair to the rest of us who risk life and limb waking family members or cats at 3:00 a.m." In the same letter, Rod lists some really outrageous cheat keys for *Miner 2049er*, chats about *Snake Byte '66*, and coyly asks us not to ask where he got his unreleased copy of *Dig Dug*. Kettle meets pot.

Derek Brusko spared the cat but interrupted his grandmother in the middle of *Winds of War, Part VII*, to have her witness his *Wavy Navy* score. (For Ms. Brusko: Ali MacGraw got out of Italy okay, Jan-Michael Vincent got his submarine blown up, and Bob Mitchum told Stalin where to get off.)

Defender dilemma: **Warner Young** tried to beat the high score, but "when I got 7,000,000, the game went to pieces and told me I had no ships but let me continue playing. Then it said that I had four ships. After one died, I had two ships, and when both of them had died, I still had not received an extra ship. I'd like to know if this is a bug common to all the *Defender* cartridges or if mine was only a freak."

Kevin Rehak's Pie Man score is reinstated at 60, the point at which those early versions of the game go into turkeyshoot slowdown mode and allow wild high scores to be racked up. If you, like **Scott Gentry**, have one of them, Penguin will cheerfully exchange it for the corrected version.

No more scores for *Nightcrawler*, no way, nohow! Every copy of that game in existence is pirated. We don't care how different it is from *Photar*, the official release version—*Nightcrawler* was simply never publicly available.

Yes, we're still taking scores for *Cannonball Blitz*, but, just like it says at the very top of this column, they will only be accepted accompanied by a report of the highest level attained as well. Ditto, *Shamus*. (The highs of **Bill Sheen** and **Jonathan Hopwood** respectively are being held in temporary abeyance until such info is forthcoming.) **Doug Zavodny** points out, however, that in the case of *Cannonball* even this may not be enough to reward true worth, as it is even easier to jump from platform to platform on the elevator screen than it is to take the first-level keep-jumping-over-cannonballs route. But enough of that. Now, for the benefit of virtually everyone, right here, absolutely free, courtesy of this magazine and **David Duplantis**, is a way to get past the third level: "Get to the highest point on the far right side

of the screen and jump to the little island next to the platform with the huge cannon on it. Wait for the cannonball to bounce over your head. When it is directly above you, run to the left and jump to the platform. Wait almost at the very end for the cannonball to bounce over your head and rush to the left of the ladder. Easy, right? I wish I had a self-centering joystick; it would make things a lot easier." Thank you, David. You are as generous as your joystick is un-self-centered.

Okay, it's Hall of Fame time again. These are the folks who have gone a full six months unchallenged. It's time to hang up your laurels, people, and we don't want to hear any whining. If you want to make a comeback, beat your old score and you'll go back. And, for the rest of you, if you had or think you can get a higher score on any of these games, send it in and the game will be listed here once more. It's that simple. This means you, **Brian Donnelly** and **Jim Kelton** (but since you obviously don't read this, how will you know?).

Now let's hear it for **Ron "Wet Look" Bunch** (Collegedale, TN), for *Alien Rain*; **Clark "Drowned Look" Alyea** (Bloomington, IN), for *Alien Typhoon* and *Star Thief*; **Joey "Cosmic" Grisaffi** (Houston, TX), for *Andromeda* and *Suicide*; **Patrick "Revved Up" Moran** (Amherst, NY), for *Autobahn*; **Robert "Let's Party!" Skell** (East Wenatchee, WA), for *Beer Run*; **Harry "Hungry" Ilg** (Chesterfield, MO), for *Bezman*; **Ed "Lockjaw" Mixon** (Ypsilanti, MI), for *Chomper* and *Dodge Racer*; **Dave "Circus Boy" Albert** (Aurora, IL), for *Clowns and Balloons*; **John "Deadeye" Shaw** (Fresno, CA), for *Crossfire* (Atari); **Chris "Snakeeye" Conway** (Winnetka, CA), for *Cyclod*; **Horace "Gums" Gower** (Freeport, ME), for *Jawbreaker* (Apple); **Chris "Early Warning" Athanas** (Topsham, ME), for *Missile Attack*; **John "Freeze Dried" Coffee** (Grand Rapids, MI), for *Morloc's Tower*; **David "Flippers" Taylor** (Chandler, AZ), for *Raster Blaster* (Atari); **Chris "Fight On" Wysocki** (Brookfield Heights, CT), for *Snack Attack* and *Super Invader*; **Lisa "Nastassia" Kislak** (North Palm Beach, FL), for *Snake Byte*; and **Brian "Moon Man" Donnelly** (Ipswich, MA), for *Tranquility Base*.

Okay, ready to make some money? This time, we'll mark the prizes up to \$49 apiece so you can go buy something really snazzy, with four-color packaging and everything. Popping up at random from the March high scores, the winners are. . . .

Apple win: **Mike Williams**, *Hungry Boy*
Atari win: **George Becker**, *Snake Byte*
Overall: **Terry Rora**, *Picnic Paranoia*

Send us your full addresses, you all, and the cash is yours. And to **Wayland Lim**, who frowned on the very idea of "giving kids money for playing games, a selfish and unproductive activity" last issue, **John Mellot**, January Atari winner for *Jawbreaker*, replies: "All I can say is that I use games to relax after school while I'm not working on my Atari Col-compiler." Take the hint, Wayland.

Congratulations to the ubiquitous **Carl Webb** on his appointment as ambassador to the Bezdardian system.

And sort of congratulations to **Caleb Epstein**, who got a low score on *Pest Patrol* but played for an hour and a half and asked if we could at least mention him. Sure thing.

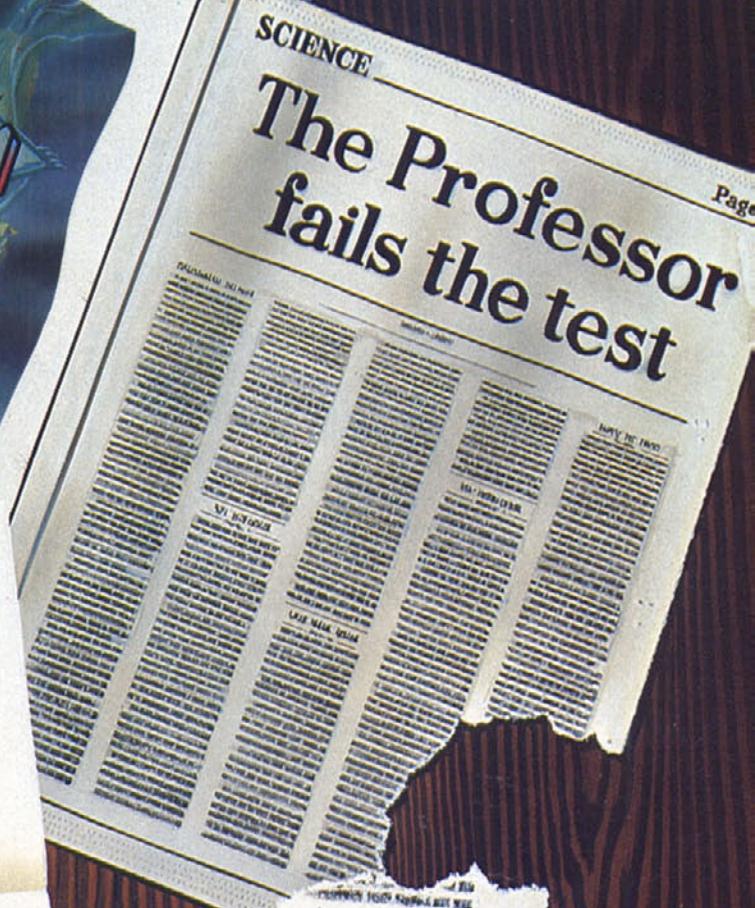
Next issue: The Caleb Epstein Contest!!!
(Kidding.)

Game/Publisher Score Player

Quadrant 6112 , Sensible	*100,650	Clark Alyea, Bloomington, IN
Rear Guard (Apple), Adventure Int'l	*321,475	Peter Alyea, Bloomington, IN
Repton , Sirius	2,010,005	Jim Nitchals, San Diego, CA
Rescue at Rigel (Apple), Epyx	1,322	Bruce Schlickbernd, Westminster, CA
Robot Attack , Big Five	19,210	Mike Bolduan, Lake Oswego, OR
Rocket Command , Norell	*999,980	Paul MacQuiddy, Sunnyvale, CA
Ruski Duck , Gebelli	*375,000	Brian Schneider, Des Moines, IA
Scarfan , Cornsoft	300,740	Greg Simpson, Orange, CA
Sea Dragon , Adventure Int'l	*180,900	David Jones, Longwood, FL
Seafox , Broderbund	*202,850	Elizabeth Crowe, Saginaw, MI
Serpentine , Broderbund	Level 54/*6,112,700	Joe Schwartz, Andover, NJ
Sheila , H.A.L. Labs	*155,917	Scott Brown, Riverside, CA
Shooting Arcade , Datasoft	*94,740	Robert Gobelbecker, Willowick, OH
Shooting Gallery (Atari), Analog	*12,830	Michael Little, Catonsville, MD
Shuttle Intercept , Hayden	*3,925	Christopher Chan, Trenton, NJ
Slime , Synapse	Storm 34/227,730	Terry Rora, Roanoke, IL
Snake , Heath	Progressive/*282,550	John Picken, Garden Grove, CA
Snapper , Silicon Valley	144,759	Jean-Michael Decombe, Vancresson, France
Sneakers , Sirius	*7,656	Bobby Moy, New York, NY
Space Ace , London Software	*21,510	Bobby Moy, New York, NY
Space Adventure , Sierra	*1,000	Chris MacDonald, Dana Point, CA
Space Album: Tail Gunner , California Pacific	*53,010	Charles Destrempe, Whitinsville, MA
Space Eggs (Apple), Sirius	*75,115	Joel Frickhoeffter, Statesville, NC
Space Eggs (Atari), Sirius	*2,045	Bobby Moy, New York, NY
Space Invasion , SSM	6 Racks/*74	Chris Athanas, Topsham, ME
Space Quarks , Broderbund	*31,870	Clark Alyea, Bloomington, IN
Space Raiders , USA	*Galaxy Commander: 260	John Yee, Pinole, CA
Spectre , DataMost	*18,400	Buell Hollister III, Shelburne, VT
Speedway Blast , IDSI	*6,342,146	Tommy Yang, San Luis Obispo, CA
Spy's Demise , Penguin	*63,968	Curtis Rae, Woodside, CA
Star Blaster , Piccadilly	*416,000	Chris MacChesney, Fresno, CA
Star Dance , USA	*3,605	Michael Steiner, Killeen, TX
Star Maze , Sir-tech	Level 16/172,925	David Snid, Shawnee Mission, KS
Star Thief , Cavalier	(2 Player) *48,280	Craig Wilson, Madeira, OH
Stellar Escort , Big Five	*19,300	Chris Athanas, Topsham, ME
Stellar Invaders , Apple	*208,330	Wayland Lim, Cupertino, CA
Stellar Shuttle , Broderbund	*17,200	Bobby Moy, New York, NY
Stickybear Bop , Xerox Educational	*148,980	Tim Hanna, Parma, OH
Stratos , Adventure Int'l	*19,180	Dean Rekich, Prospect, PA
Strike Force , Melbourne House	*433,900	Chris Athanas and Neil Kincaid, Topsham, ME
Succession , Piccadilly	*3,100	Christopher Chan, Trenton, NJ
Super Breakout , Atari	Progressive/*3,337	Richard Caldwell, Edgewood, MD
Super Nova , Big Five	*222,310	Leonard Marinaccio, Cape Girardeau, MO
Super Puckman , ADO Software	*64,140	Steve MacQuiddy, Sunnyvale, CA
Super Taxman II , H.A.L. Labs	*225,490	Scott Brown, Riverside, CA
Swashbuckler , DataMost	4,500	Brian W. Fargo, Newport Beach, CA
Tanktics , Avalon Hill	*606	Jeff Zeissner, Fountain Valley, CA
Teleport , Cavalier	Level 12/*13,150	Devon Tuck, Danville, CA
Tharolian Tunnels , Software Farm	*134,607	Steven Gazis, Queens, NY
Thief , DataMost	*38,600	Scott Wedel, Saratoga, CA
Threshold (Apple), Sierra On-Line	*751,000	James Baker, Alexandria, VA
Thunder Bombs , Penguin	*20,360	Buell Hollister IV, Shelburne, VT
Thunderbird , Urban Software	*31,450	Carl de Marcken, Collegeville, MN
Track Attack (Apple), Broderbund	53,341	Brian Donnelly, Ipswich, MA
Tubeway , DataMost	*90,801	Jim Stockla, Shelton, CT
Tumblebugs (Apple), Datasoft	15,130	Kent Hathaway, Milwaukee, WI
Tumblebugs (Atari), Datasoft	*38,785	Tad Hamilton, New York, NY
Tunnel Terror , Adventure Int'l	*252,780	Curtis Rae, Woodside, CA
Turmoil , Sirius	*83,540	Bobby Moy, New York, NY
Type Attack , Sirius	179,975	Dr. Jim Hauser, San Luis Obispo, CA
Viper , RDA Systems	*5,995	David Sterner, Bethlehem, PA
Vortex , DataMost	*13,660	Christopher Chan, Trenton, NJ
Wall War , Sierra On-Line	*61,470	Bobby Moy, New York, NY
Warp Destroyer , Piccadilly	*89,950	John Osborne, Menlo Park, CA
Wavy Navy , Sirius	*52,380	Josh Horwich, Larchmont, NY
Wayout , Sirius	*7	Rod Bonios, Van Nuys, CA
Wizard of Wor , Roklan	*453,500	Philip Rould, Newmarket, NH
Zargs , Insoft	*2,092	Craig Morris, Menlo Park, CA
Zenith , Gebelli	*69,650	Jim Stockla, Shelton, CT
Zero Gravity Pinball , Avant-Garde	*19,100	Joel Frickhoeffter, Statesville, NC



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Dear cousin:

Alas, for when you read this letter you shall know-perish the thought-that I have perished! You see, my bar-
rister holds instructions to forward this letter ONLY IN
THE EVENT OF MY UNFORTUNATE DEMISE!

Years ago, during my worldly travels, I chanced upon a
treasure map suggesting huge wealth buried on a little-
known tropic isle. Naturally, I pursued it, forthwith and
to wit, fully suspecting certain unspeakable dangers
inherent to the task. Unfortunately, they proved to be
dangers so vile, so terrible, so incredible, that no human
being should ever be forced to face. Yet, I faced this
force of evil and, as you may realize upon receipt of these
words, have indeed succumbed in the attempt.

Though I may have failed, the challenge is passed along
to you! So accept the torch. Go! Seek it out, to wit and
forthwith. But hark, I warn you-stay alert, be ever on
your guard, and beware for your very life! Because each
step of the way you will face DEATH IN THE CARIBBEAN.

Your loving cousin,

Professor Herman Q. Hemmerdinger
PROFESSOR HERMAN Q. HEMMERDINGER
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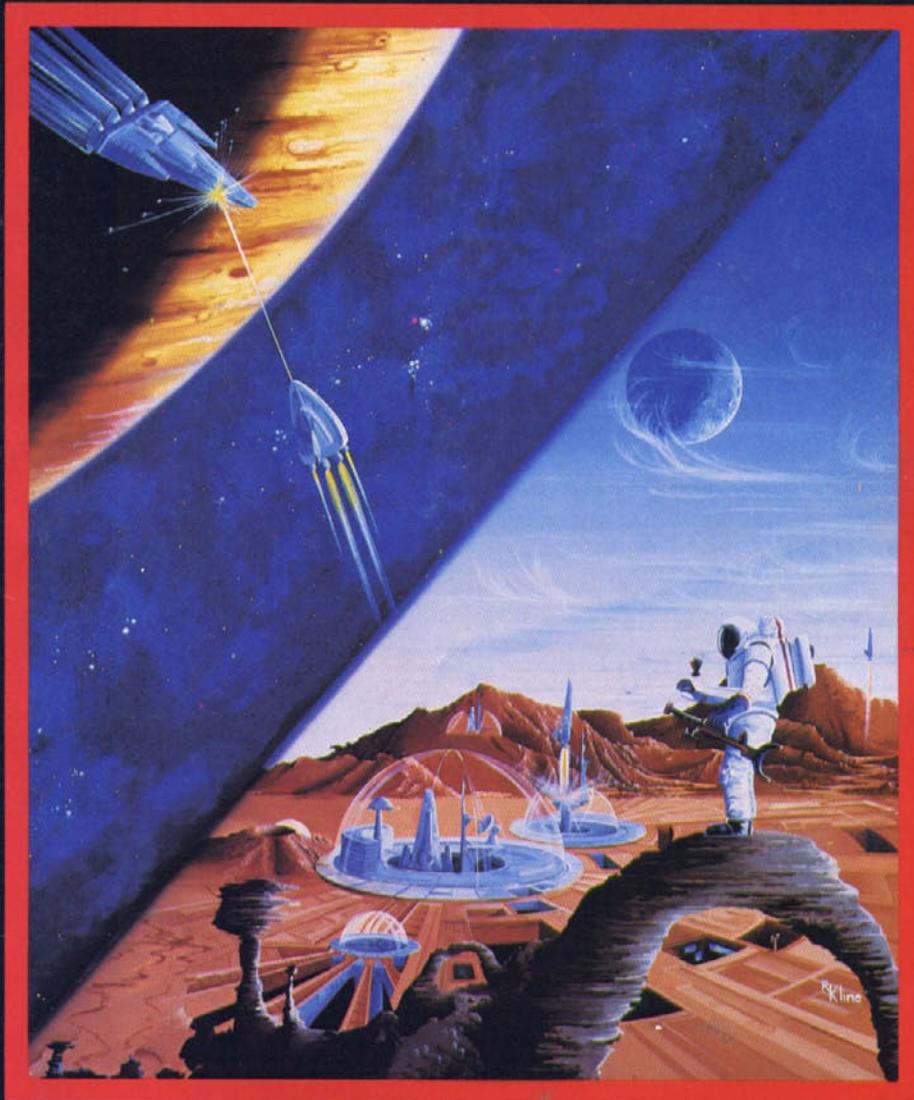
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