SOFTLINE

SOMEWHERE ON THIS MAP THERE'S BURIED TREASURE.

FIND IT AND WIN IT!

COMPUTER GAME

No Contest

That's what there usually was in this space.

And now there still won't be one.

There will be several. You need an outlet for your creative/puzzle solving/game playing ability, and we need an outlet for a lot of our surplus money. Agreed?

Mind you, we've already gotten rid of some of it by expanding the magazine to twice its size and buying out the stock of associate publisher Ken Williams. Ken's final venture into Apple graphics appears this issue. It's been lots of fun having Ken along, benefiting from his knowledge and spending his money, but he started letting his hobbies keep him from his writing. He's now decided to try eking out a living from his side interests, running his little company, which he's calling Sierra On-Line, full time. *Softline*—now a wholly owned publication of Softalk Publishing Inc.—wishes him all the luck. Next issue, the *Softline* graphic tradition continues unabated in a breathtaking expanded mode.

Okay! Let's get down to business!

High Score of the Month. We know the kind of blood, sweat, and ligament damage that goes into making up the awesome honor roll of our High Scores pages. We know the anxiety and deep-rooted neuroses that can result from having to deal with people who consider you slightly lower in the food chain than certain subspecies of noxious bayou fungi for indulging in our favorite pastime. To defray your medical bills and allow you to buy more games, *Softline*'s random game generator will be selecting high scores from our rolls and awarding honorariums of $29.95 apiece. This month, the winners are:

> Apple category: **Mike Post,** *Roach Hotel*
> Atari category: **Mike Keck,** *Viper*
> Overall: **King Barnes,** *Flight Simulator*

Nice work. Drop us a line, why don't you, so we can send you your money. Next issue there'll be three more games, three more winners, and a little more money.

Contest 2. We do not intend to leave out the adventurous among you. The outpouring of offered assistance that graces Directline every time someone reports themselves stuck in the middle of an adventure or role-playing fantasy has not left us unmoved. Such displays of public-spirited good samaritanism shall be rewarded.

Henceforward, all those who submit the most intriguing game tips will have their efforts printed herein and will receive a service honorarium of $50. Tips will be judged on general jazziness and/or how challenging they are to figure out in and of themselves. Cryptograms, anagrams, crossword puzzles; you name it. Impress us. Anything we can't figure out will become another contest and we'll have to give you even more money.

Write your tip in response to one or more of the following pleas:

Help Todd Goluba get past the chasm in the cave on the Isle of Storms in *Ulysses*.

Help John Perrine find the princess in *Wizard and the Princess*. He's already "rowed to the other island, taken the harp and the anchor and shovel and anything else under the sun . . . how about the chasm and the cottage and all those other nonuseful objects like the locket (I already tried opening it)."

Help Richard A. Faro, in much the same situation in *Castles of Darkness*. He has the necklace, key, ring, pickax, bar, parchment, charm, and "standard items."

Help Reed Hubbard find the 350th point in Microsoft's *Adventure*.

Help Marc Wontorek, currently residing on Scott Adams's *Savage Island* and having trouble surviving the hurricane. He would also like to know if there is a light source and, if so, where?

Address your most devious efforts to Softline Tip, Box 60, North Hollywood, CA 91603.

Additional contests will be scattered throughout the magazine as the mood strikes us. Keep your eyes peeled.

Arcade Machine contest update: Broderbund, as you should all know, is holding a contest for games designed on their *Arcade Machine* software design package. Every month through June, starting in January, a panel of distinguished judges—Doug Carlston, Chris Jochumson, Gary Carlston, Dan Gorlin, Dave Snider, and Bill Budge—will award $200 worth of hardware and software to finalists. The monthly winners will be eligible for the grand prize of $1,500 worth of hardware or software and the runner-up prize of $500 worth of the same.

So far, the Broderbunders have received a total of eight entries. Kathy Carlston theorizes that either people are "afraid we'll steal their ideas," or are waiting for the right moment. "If I were doing this, I would wait until I had something really good, then send in my best effort, after getting in the most practice."

Judging is based on originality and the use of the greatest number of the capabilities of the program. This is where most entries have fallen down so far, basically reworking the program's available shapes and ignoring the path creator and animation and graphic options. Details can be had by calling or writing Broderbund Software, 1938 Fourth Street, San Rafael, CA 94901; (415) 456-6424. They're nice people and won't steal your ideas.

Getting Smart: The Computer EdGame Challenge, sponsored by Verbatim as a public service to advance students' knowledge of computer technology, is officially underway as of January.

The three-month competition to develop high-quality educational software that is informative, imaginative, entertaining, and nonviolent is open to teachers, professionals, or students. (This leaves out very few people.) It will be administered by Conduit and MicroSift, nonprofit organizations specializing in the review and evaluation of educational software.

"We believe the appeal and popularity of electronic games can be channeled in a practical, constructive way in the educational field," says Judy Edwards Allen, director of the computer technology program at MicroSift.

Each of the three divisions—elementary, secondary, and postsecondary—has twenty categories, such as mathematics, language arts, science, health, nutrition, social studies, and business. All entries must be submitted on a 5¼-inch disk or data cassette, programmed on any of the microcomputers currently used extensively in educational systems throughout the world, such as those brought to you by Apple, Atari, Commodore, IBM, Texas Instruments, Radio Shack, and Timex.

Disks containing the best entries will be distributed at a cost of $3.50 apiece after the contest. Royalties will be paid to those whose entries are thus selected. To encourage participation, Verbatim is offering the first 2,500 entrants two free Datalife disks.

More information is available from participating Computerland stores, or by calling (800) 221-4052.

How about that Wizard versus the Wizards contest in Vegas, huh? Too bad you didn't get to go. Just to make it up to you, Software Distributors will be launching a Wizard versus the Wizards home contest in your local computer store shortly. Regional winners will receive a Bally video arcade machine and be flown to the April Comdex to compete for $50,000 in prizes. See your local computer store for details.

Hey, everyone and their Aunt Petunia wants those amazing 3-D maze programs. Unfortunately, not all of you are following directions closely enough to specify if your disk—*uninitialized*, mind you (too much to ask, huh?)—is Apple or Atari. And, of course, a disk is a disk is a disk, so you-all get to take potluck, including those of you who made frantic phone calls after the fact, if your call came too late. Next time you'll know, right? Right.

Now get to work.   SL

DIRECTLINE

Taxed for Fun and Profit

I saw in November '82 High Scores the game *Taxman* by H.A.L. Labs. Please advise me where I might purchase this game for the Apple II Plus.

Greg C. Munsell, C.P.A., Las Vegas, NV

It seems we can never answer this question enough. Taxman *(and* Super Taxman 2*) are available from H.A.L. Labs, 4074 Midland Road, Suite 23, Riverside, CA 92505. Their relationship to matters of internal revenue is slight.*

Your Basic Ounce of Prevention

There are a couple ways to answer D. Wolfsdorf's request for Applesoft Basic commands that prevent a break in the program when reset is hit (November '82 Directline). Try the following:
    POKE 1010,0: POKE 1011,198: POKE 1012,99
Now when the reset key is hit the disk drive should boot.

Mark Cal, Rockford, IL

Future Adaptations

I am just getting into computers and will be getting an Atari 800. When I do, I will not be able to afford any cartridges or programs. I have seen the games that Ken Rose has written and they are the best I've seen in a long time. Since they are written in Basic for the Apple, I would like to know how to adapt them so they will be playable on the Atari. Is there an easy way to do this, or can you provide listings of the games on the Atari too?

Richard Stolcpart, Cicero, IL

Ken Rose's adventures are now eminently playable on the Atari (starting this issue) along with handy directions on how to adapt them to an Apple—much easier than adapting Applesoft programs to an Atari. Anyone who has done this, or is doing so, or could do so, has a place in these pages and should contact this magazine. Toot sweet.

At Your Service

Brian Service wanted a hint to Microsoft's *Adventure*, so here's my contribution: Remember, you are in a repository for the whole program. Look for something in that room that you have not seen before entering that room. Once you find it, place it in the right part of the room and don't get too close.

I've gotten out of this repository several times, but at best I've scored only 349 points total. That last point is just impossible to find! I've tried everything. Can anyone help me with a hint on getting that last point?

Reed Hubbard, Jackson, MS

Rust never sleeps in that blasted game; stop being greedy and just find a way out. That's all the advice you'll get from me. By the way, isn't *Adventure* a dynamite game?

Don DeCosta, Riverside, CA

The trick is to find something and then say the right word. I'll leave the details for you to figure out.

I've finished *The Wizard and the Princess*, but I am not quite through with *Cranston Manor* yet. My problem is that I cannot find the identification card that will let me through the blast door. Other than that, I think I have the whole thing solved. Does anyone know a way to neutralize the armor or the soldier?

Alexander Wei, Newton, MA

I believe the solution you seek is a random one. If it doesn't work you could be boiled by molten lava, but if it does work the dwarfs will awaken and carry you from the room. By the way, does anyone know where I can get the gold coin for the merchant in *The Wizard and the Princess?*

Jeff Frank, Albion, MI

Catch a Buzz

In response to D. Wolfsdorf's question in November '82 Directline about *Aventureland*, there are three ways to awaken the dragon. The first involves beeing (yes, beeing) helpful. The second way makes the dragon use his nose. And the third way blows up the whole day for him. Of course, we can't disclose the entire answer. These hints should be a good start.

Daniel V. Horn II, technical manager,
Adventure International,
Longwood, FL

Cavernous Calculations

In *Caverns of Mars*, I don't quite believe that with some fancy maneuvering you could go to the next level but not the next cavern. I wrote an equation that would tell the highest score I could figure out for this game. I found that you do get points going down and up through the levels, except going up through level two for some strange reason, giving a total of 186,400 points after going through all five caverns. If you could hit all the targets, including all the rockets in level two (obviously impossible), you would get 255,750 points total in all five caverns. When you add these totals you get 442,150 points.

Robert E. Rendahl, Torrance, CA

Challenge from the Robotniks

National *RobotWar* tournaments are being held monthly and are open to anyone. T-shirts, boxes of disks, and other prizes are awarded to the five top finalists. When there are more entries the prizes get better. All you've got to do is provide a disk with the object code of one robot under two names and a nominal fee. All disks are returned with the addition of the five finalists on it. If you're a finalist you will be receiving your prize too. For more information write to Frank Krogh, Box 5337, North Hollywood, CA 91616.

Jason Meggs, Bethesda, MD

Feeling Tipsy—Texas Style?

I have just finished reading a recent issue of *Softline* and I find it very interesting. Does anyone have any tips about programming with the TI-99/4A? How about any books or articles you can steer me toward? Most references in *Softline* are to other computers. Can anyone help?

Peter Rzeminski, Orland Park, IL

Sharing Adventures

I would like some help on a matter of interest to me. I am a great fan of Donald Brown's *Eamon* program. My hat is off to Mr. Brown for the loving efforts that went into giving the world such an excellent program, and one that is free to the public. I taught myself to program by tearing his programs apart and tinkering with them. I have, in the ensuing months, written three brand-new *Eamon* adventures myself and I would like to be able to share them with the waiting world. However, I cannot find a central clearing house for additional *Eamon* adventures. I have written Mr. Brown twice, thanking him for his gift to the computer world and each time en-

closing a self-addressed and stamped envelope, but I have gotten no reply after several months. Does anyone know of a place that I can write to and obtain additional adventures, and then provide my own for distribution? I have a number of adventures and, additionally, I have written *The Lair of Mutants*, *The Quest for the Holy Grail* (a la Python), and *The Citadel of Blood*, with more in the works. I'd appreciate hearing about any leads through Directline.

Evan Hodson, Harker Heights, TX

Pet Training

One of my friends, an Apple freak, let me read some of his *Softline* magazines. I programmed *Attack of the Three-Toed Ogre* into my Commodore Pet and with a few minor adjustments it worked fine. The Commodore I have runs on a tape, has a scrunched-up keyboard, and I have to slug it to get it started. Anyway, my father and I plan to buy a new computer soon and we have our eyes on the IBM Personal Computer. Since quite a lot of software is written in Applesoft Basic, I'd like to know if anyone knows an easy way to convert from Applesoft to IBM or Pet Basic?

David Bean, Bountiful, UT

Starting Young

Geoffrey Puterbaugh (May '82 *Softline*) said that software copying is totally unjustifiable. I agree and disagree. I am only twelve years old and I can't afford $35 to $50 for a game. I can afford $2.50 for a cheap disk and a copy, though. I am opposed to copying the products of certain companies like Penguin Software because I would love to help their business, not hurt it. I also break disks. This is good because it enables me to change listings and the programs. Penguin Software has made this possible without the risk of killing the disk.

I thought I copied a lot, but then I met a person who had more than 300 games, almost all pirated, that he trades with people in Japan and Canada. If the price of software goes down about 50 percent I will stop pirating.

In the same issue, Jack O'Brian talked about the frustration of games. For example, I think *Castle Wolfenstein* is awesome. *Gorgon* is a fun game—as I played I kept getting better and better; I was advancing my score by about 1,500 points each week. I think *Wizard and the Princess* is extra hard. (How do you fill the hole in the rowboat?) *Mission Asteroid* is quite easy. I still haven't found out where to stash the treasure or how to inflate the boat in *Zork I*.

By the way, does anyone need a computer salesman who will work cheap? I will.

George Eliade, Nashua, NH

Advice

Since you will no longer be sending out *Softline* for free, you might be interested in the things about your format that make me reluctant to subscribe.

My principal complaint is that your reviews in Gameline don't include pictures of what the games look like on the screen. Is it that hard to do? I notice that you scatter color photos of various people throughout the magazine, so I don't see what's so difficult. I'm sure that the people in the photos are gratified, but you'll probably get better results if you try to gratify your subscribers a bit more. Why you wasted a color photo on the fellow who won the championship on the standalone arcade version of *Pac-Man* is totally beyond me. Surely this belongs in one of the glossy new magazines devoted to video arcade games, rather than in a magazine devoted to game-playing on personal computers.

Gameline also fails to mention what computer a game is for until the very end of the review, in small print. Now I am used to seeing this occur in manufacturers' ads, where it is sometimes an adventure just to locate the name of the computer the software is written for. (For example, see the ad from Lord of the Games on page 9 of the September issue.) But it does no good for me to complain to them, for the only readers who become annoyed are those who won't be buying that particular software anyway. Since none of the games reviewed in your September issue are available on more than one computer, it seems to me you ought to display the name of that computer prominently near the title.

But it is the lack of screen photos in the reviews that really galls me. Most game manufacturers try to fool the consumer by hiding what the game actually looks like behind a facade of pretty artwork that gives no feel for what the game is really like. There do exist a handful of courageous firms whose ads actually show what their games look like (SubLogic and Broderbund come immediately to mind), but most of the time we have to rely on reviews to get some notion of what the game is really like in play.

I haven't yet made up my mind if I'll subscribe, since you may improve in the future. Also, since I have an Atari computer, I'm interested in seeing if Bill Williams is going to tell me something in his column that I ought to know. I'm sure that someone has figured out how to use the Atari's four built-in digital to analog converters at high speed to produce varied musical timbres, but so far all the articles I've seen in magazines have dealt only with how to turn your Atari into a slightly out of tune toy organ, or how to vary the three noise generators to produce sound effects.

Perhaps you'd be better off skipping the game reviews entirely and turning *Softline* into an instructional magazine for would-be game programmers.

George Fergus, Schaumburg, IL

Change is our only constant, George. We're easy: if we see a large show of hands for any of your suggestions, we'll accommodate. As to the matter of screen photos, we have indeed hesitated to use them: two such photos would take up the space of one potential additional review. How about it, people? Do the words get the idea across sufficiently, or would visual aids be worth the tradeoff? Let us know. (And let us know also if any of you would-be game programmers read, too.) SL

Once upon a time, hundreds of years ago, all the greatest role-playing fantasy game heroes and heroines gathered in a great outdoor congress, much like the trappers and mountaineers used to do in the Old West. They brought with them their finest weapons and armor—golden swords, diamond plate, magical staffs—and the many treasures they had gathered in their exploits.

All went wonderfully well for the first week of the congress; then there appeared on the scene one Guorvaad, son of the stormy, curse-created union of an overthrown ogress and one of the greatest fantasy heroes of all time. Guorvaad had spent his formative years constantly beset by the question of whether he should be good or bad. His soul drew him both ways strongly—until the congress.

Seeing so many great heroes at once at the congress was too much for Guorvaad. He knew he could never be as great as they were, yet his instinct toward the good required that he be the best. His instinct toward the bad, on the other hand, held no such strictures: he could be as bad as he pleased at being bad and still fulfill the ultimate of his darker side.

Once the lines were drawn in this new perspective, Guorvaad had no trouble choosing. Why follow a path where failure was certain when there beckoned another path where success was nearly as sure? Then and there, Guorvaad decided to be evil; and he wasted no time acting on his decision.

Guorvaad laid traps throughout the meeting grounds, traps especially designed for heroes. Some killed their victims, others captured them for Guorvaad's pleasure later—to torture and destroy. As he succeeded in his black activities, he grew confident and strong. Soon he believed he was the strongest person in his entire part of the world, and he challenged the remaining heroes to supposedly fair fights.

Of course, the fights weren't fair. Guorvaad howled with pleasure at the sight of his honorable victims falling prey to his vile cheating and tricks. He flaunted his disregard for fair play and felt proud.

And from each of his victims he removed all marvelous weapons and armor, which he kept for himself, and all treasure, which he buried secretly because he didn't trust anybody more than he would have trusted himself.

Eventually, the greatest hero of all arrived late at the congress, delayed by his inability to pass up an opportunity for heroism, for risking his life for a worthy cause; his name was Great. As he had approached the meeting ground, he had heard of the terrible events Guorvaad was perpetrating within. Great recognized immediately the greatest opportunity for heroism he had ever known, and he was prepared to embrace it.

Among his many heroic talents, Great had a flair for theatrics and nearly a wizard's command of magic. So when he arrived at the congress, no one recognized him. He appeared small and meek, slouching on his horse as though he would like to hide behind it.

When Guorvaad heard that the new arrival claimed to be a hero, he marched to him and threw him from his horse into a mud puddle. Great shrank from the evil giant and cowered when Guorvaad spoke. When Guorvaad asked his name, Great blushed as he answered honestly. And Guorvaad began to laugh.

Guorvaad laughed and laughed until he doubled over in glee. He laughed and chuckled until tears filled his eyes and danced down his cheeks. He was enjoying such a good laugh that he never noticed when Great rose from the mud puddle to his full height. He never noticed when the mud magically disappeared from Great's skin and clothes and it seemed as though a sun rose from within his breast and its light radiated from him. He never noticed Great raise his arm before him nor the strange shimmering almost-light it seemed to create.

When he tried to pause in his laughter to catch his breath, he couldn't. He couldn't stop laughing. He began to choke, to suffocate, and still he laughed, he chuckled, he howled. When, in desperation, he forced his twinkled eyes open and saw what Great had become, his pupils glazed in terror. He saw that Great, too, had the power of evil but that Great had chosen good, and he knew

then all that he had done. In the instant of full knowledge Guorvaad expired, his face still contorted in hideous laughter and terror deepset in his eyes.

Great seldom used his magic and was exhausted from the powerful strain of it. Nor was he pleased at a victory over such a pitiful adversary. He mourned Guorvaad's victims and left the congress in quiet thought, refusing to seek Guorvaad's treasure as his spoils.

The treasure was never found. Recently, the updated map reproduced here and on the cover was mailed anonymously to *Softline* along with the story of the fantasy role-playing heroes' congress and a challenge to *Softline*'s readers to find the treasure on the basis of some strange clues.

The note further promised that the *Softline* reader who finds the treasure and best estimates its value may keep it.

Clues. Unless specified otherwise or impossible, all references to routes refer to roadways; any means of crossing water may be part of a route if it occurs in the course of a roadway. One inch equals thirty-two paces.

You arrive via plane at the main airport in the southeast section of the map. You enter through the small red customshouse in the southeast corner of the airport.

1. The treasure is not wet.

2. From the town, there is a route to the treasure that crosses exactly one bridge.

3. You can get to the treasure from the main airport by road without crossing any bridges or without paying any tolls, but you can't avoid both.

4. To go straight from the dungeon to the treasure, you'd have to go cross-country, cross three stretches of water, and go through two buildings.

5. Neither the lighthouse nor the treasury is the nearest building to the treasure.

6. Of the two castles, there is a path from the one closest to the treasure that crosses no bridges.

7. The treasure is equidistant from a toll road, a free road, and a dirt road. These are the nearest roads to the treasure.

8. Flying would not help in getting from the military base or the mission to the treasure.

9. The shortest route from the yacht to the building nearest the treasure does not pass within twenty paces of the treasure.

10. In taking the shortest route from the farthest castle from the treasure to the building nearest the treasure, you come to at least two intersections after passing a farm road.

11. From the entrance to the building nearest the treasure, walk due south to a dirt road, cross the road, walk two dozen paces in the direction of the front of the customshouse, and mark the spot.

Part 1. Measure and write down the distances in inches from the spot you've marked to the outside (cut) edge of the page and to the top of the page, and go on to part 2.

Part 2. Once you have found the treasure, determine the shortest possible route, staying on the road to the road's nearest point to the treasure, from the customshouse door at the airport to the treasure. Write down this distance in paces.

The Winner. The person who finds the treasure and turns in the shortest actual route from the customshouse to the treasure will win a prize worth as many dollars as paces in the route.

Do It Now! Fill out the coupon or a facsimile of the coupon, and mail it to Softline Map, Box 60, North Hollywood, CA 91603. 🅂🅻

My name _____
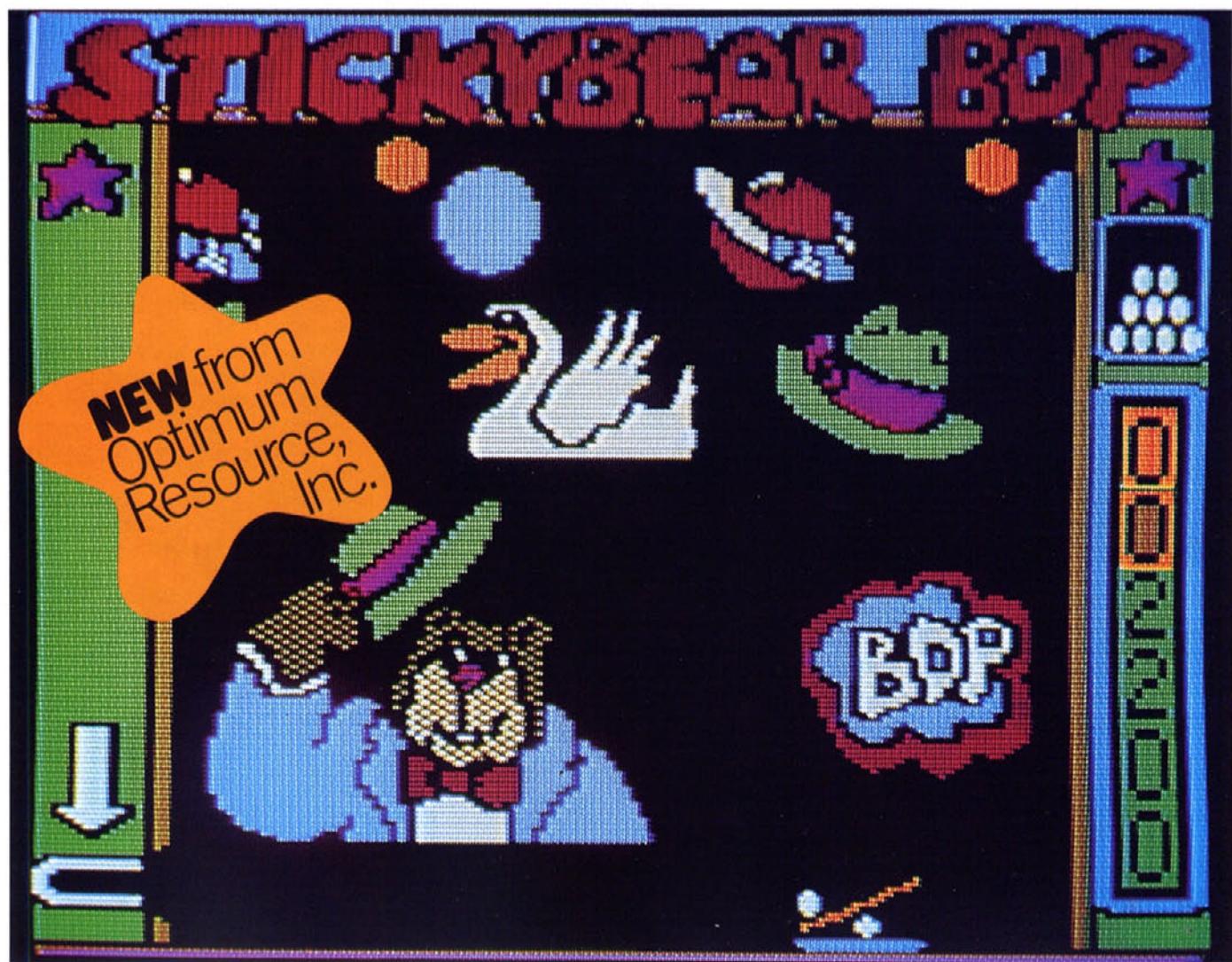
My location _____

_____

Distance in inches _____

Number of paces in shortest route _____

WHAT YOU SEE IS WHAT YOU GET.
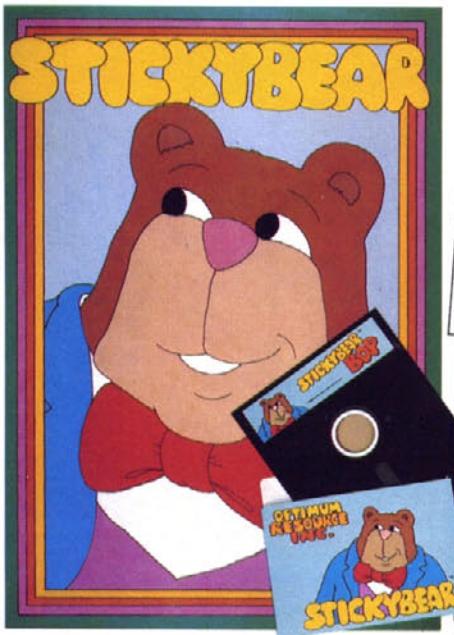
Introducing the most advanced computer animation ever created for the Apple®!

NEW from Optimum Resource, Inc.

Actual Reproduction

An adventure game is only as good as its parser. That's the part of the program through which the player communicates with the game's environment. The importance of the parser to the value of the game cannot be understated—although why it's so crucial isn't obvious. It would be easier, perhaps, to say that an adventure can only be as sophisticated as its parser, but that's not enough. An adventure is only as fun as its parser allows it to be; if the parser gets in the way of the player's creative expression, even the best plotted game can become slow, tedious, and frustrating.

Adventure game parsers need not address the difficult (and for the most part, unsolved) problems involved in general English usage; their domain is limited to imperative sentences, a small subset of the language. Traditionally, the adventure parser understands sentences consisting of a single word (a verb or special command) or a two-word sentence containing a verb and a noun.

For ease of implementation, the two-word parser is hard to beat. At the simplest level, one can simply match the player's input with all the legal sentence combinations and act accordingly. As a more general method, one can separate understanding of the verb and noun to allow for a verb to handle legally any noun that comes its way. Regardless of method, the two-word parser is the core of the vast majority of adventure games.

The implications of having a two-word parser are many. A novice user is immediately aware of the communications limitation; almost everyone first sitting down to an adventure game types sentences far more complicated than the game can understand.

When the player grasps the limits, a more serious problem occurs: how to phrase a proposed course of action in just two words. In the original *Adventure*, there is a birdcage and a bird. What could be more natural than to say, "Put the bird in the cage," or, less verbosely, "Put bird in cage." Naturally, this wouldn't work. What, then? "Put bird," "Cage bird," or "Trap bird"? The first, albeit perversely truncated, seems to be on the right track. The second and third took a bit of thought to conjure up. Unfortunately, none of these work. In fact, "Take bird," input while the player is holding the cage, places the bird in the cage automatically.

The bird and cage example demonstrates a problem inherent in two-word parsing—a problem that leads to the rejection of adventure games by potential players. The very nature of the adventure changes: what should be a fun, stimulating, goal-oriented challenge is reduced significantly to a pitched battle against the vocabulary of the game and its limited capacity to understand. With the bird and cage, you know immediately what you want to do, and that should be the end of the problem. The real problem, though, is expressing what you want to do. The solution is, perhaps, the biggest disappointment: it's magic, not logic. You lose.

In the five years during which the *Zork* games and their successors have been developed, the parser has been continually enhanced and expanded. The impetus for that expansion has been the desire to present the player with new and challenging problems.

Semantic Breakthroughs. Early, some game programmers recognized the importance of adjectives in allowing the existence of

Sitting in Judgement...

Parser The Final Arbiter

by Marc S. Blank

game problem designers. The ability to *pick up* or *put down* objects is, for many people, especially beginners, more obvious than *take* and *drop*. With the flexibility of compound verbs, the game player can expect any number of different ways of expressing an action to work—for example, "Take the rod," "Pick up the rod," "Get rod," and "Take the rod from the case."

These two additions, prepositions and adjectives, are probably the most important ones to date, but others have arrived and more are arriving. In *Zork II*, the ability to command another character in the story was achieved and the following command became possible: "Tell the robot 'take the sphere.' " This advance in parser sophistication allows another new range of problems to be designed in which the cooperation of other characters becomes important in the game.

The mystery *Deadline* incorporates a more conversational (albeit limited) style to interaction with the characters. You might say, for example, "Mrs. Robner, tell me about your husband." or "Mc-Nabb, show me the holes." The important thing to realize is that the entire interactive basis of *Deadline* is predicated on the availability of a parser that allows that interaction. The need for an ever-improving interaction has consistently led to ever-improving parsers.

Besides the powerful parser extensions, there is a complement of enhancements that make game playing more enjoyable, taking the drudgery out of such commonplace adventure activities as moving to a distant location and manipulating numerous objects. Foremost among these are the ability to use multiple objects in a command ("Take the rod, the coffin, and the sack," "Push all of the buttons," "Take all but the sword") and the ability to string multiple commands on one command line ("Take all but the sword and go south," "N.N.W.N.SW.Kill the troll"). The recognition of ambiguous nouns, with the game asking for clarification ("Which tablets do you mean, the ebullion tablets or the Sneezo tablets?"), and the ability to clear up the ambiguity easily (you need only respond, "The ebullion") are intended to save the player from time-consuming repetitions. The problems might consume time, but the interaction shouldn't.

The Few, the Proud, the Parsed. It is not surprising that so few games provide this kind of richly interactive environment. The nightmare world of full-sentence recognition, compared to the simplicity of two-word parsing, is a daunting prospect. The algorithms appropriate for small-vocabulary, two-word-understanding games are well known and simple to implement. Programmers who aspire to more complex parsing are in a barely explored alien world whose inhabitants have been through, in some cases, years of false starts and setbacks.

It seems almost trite to say that the most popular games in the long run will be those that are the most fun to play. In an adventure game, fun is largely a function of that interaction that distinguishes it from other types of games: the communication between player and game. Some people seem to have missed this point: games with whizz-bang graphics and sound added to the standard two-word parser abound; too often even the minimum parser is abridged in favor of the pizzazz. They have achieved much publicity and are no doubt easier to sell to the uninitiated, but they are being replaced by games—with and without graphics—that give the player the added sense of realism and accomplishment that only an advanced parser can give.

The future of adventure games seems to lie in the development of what might be called "interactive stories," *Deadline* being an early example of what such a game might be like. The player is simply one of a number of characters, each with some motivation and style. The flow of the story is controlled not only by the player's actions but also by interactions with the other characters with whose destinies the fate of the player is inevitably tied. The parsers required for a real triumph in this new genre have not been developed and will not appear at once; they'll require a progression of smaller advances like those made over the past few years. When they arrive, a new and exciting brand of fiction will be waiting for them.

more than one object of the same kind. In a *Zork I* problem, a control panel has four buttons, each of a different color. You can, therefore, "Press the blue button." Without the understanding of adjectives, you might still say "Press blue," which, again, is not obvious. Another example from *Zork I* is doors. In the living room are two doors, a trap door (which is initially hidden) and a wooden door. The ability to distinguish between these is vital.

The addition of prepositions and compound verbs using prepositions (such as *pick up, put down, turn on*) was an important turning point in the construction of the Infocom adventure parser. There were two equally important reasons for this addition. In the case of prepositions, the need was compelling. Consider: "Put the knife in the trophy case," "Swing the sword at the cyclops," "Unlock the door with the key," "Fire the gun at the monster." Prepositions used in this way are vital if the verbs *put, swing, unlock,* and *fire* are to be used conveniently and logically. Without them, *unlock* might check whether you are holding a key and *fire* might assume the being you are trying to kill. In either case, some variety of magic has occurred and the player is somewhat cheated. The ability to use *put* properly opens a new dimension to a game, adding the concepts of containment, size, weight, bulk, and capacity. How, otherwise, as in *Zork II*, could you place some plastic explosive in a hole in the wall, insert a fuse into it, and ignite it?

Compound verbs allow a great deal of flexibility. Although the verb *look* is ubiquitous in adventure games, the additional ability to *look inside, look behind,* or *look under* adds new possibilities for

THE AMAZING MAZE PART 3-D

Finally, after hours of aimless wandering, you stumble into a more sane section of the building as the floors and ceilings start to fill in around you. But you start to slow down, as if pushing through solid air, and the strobe effect becomes even more shocking as walls jump past you in strange detail.

You step through a door and it turns into a wall behind you. In front of you is a blank wall with a sign on it. The sign reads:

"All arrangements are possible; only one way out of here is plausible. Compute it and leave; confuse the data and die."
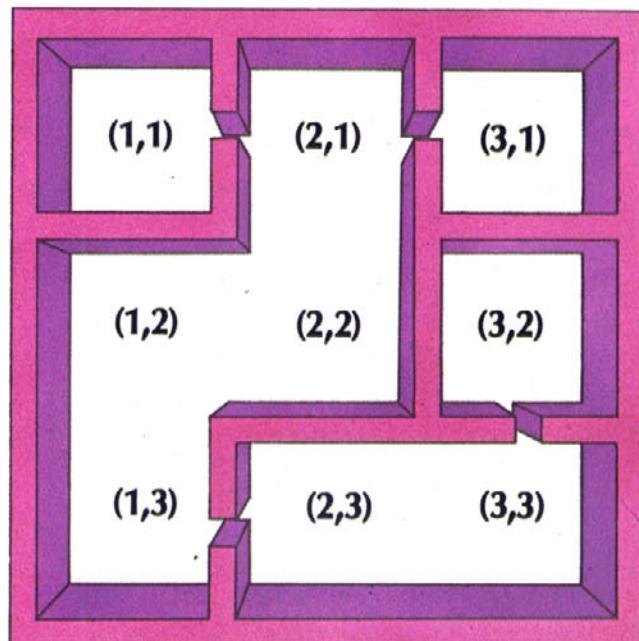
And you never paid attention to those lectures on data structures in class. . . .

Now, are you going to pay attention to this? Most of you are probably still a little hazy on how the numbers in the data statements of our previous programs represent the state of a cell in the map. So watch closely, and see something once crystal clear become dark and muddy.

Still More Life in Those Pictures. Figure 1 is a sample 3 x 3 maze. Let's encode it.

	North	East	South	West
(1,1)	wall	door	wall	wall
(2,1)	wall	door	space	door
(3,1)	wall	wall	wall	door
(1,2)	wall	space	space	wall
(2,2)	space	wall	wall	space
(3,2)	wall	wall	door	wall
(1,3)	space	door	wall	wall
(2,3)	wall	space	wall	door
(3,3)	door	wall	wall	space

All right and fine. The numbers for wall, space, and door are

Wall = 0   Space = 1   Door = 2

and we can form the numbers now as follows:

$$(1,1) = (0 * 512) + (2 * 64) + (0 * 8) + (0 * 1) = 128$$
$$(2,1) = (0 * 512) + (2 * 64) + (1 * 8) + (2 * 1) = 138$$
$$(3,1) = (0 * 512) + (0 * 64) + (0 * 8) + (2 * 1) = 2$$
$$(1,2) = (0 * 512) + (1 * 64) + (1 * 8) + (0 * 1) = 72$$
$$(2,2) = (1 * 512) + (0 * 64) + (0 * 8) + (1 * 1) = 513$$
$$(3,2) = (0 * 512) + (0 * 64) + (2 * 8) + (0 * 1) = 16$$
$$(1,3) = (1 * 512) + (2 * 64) + (0 * 8) + (0 * 1) = 640$$
$$(2,3) = (0 * 512) + (1 * 64) + (0 * 8) + (2 * 1) = 66$$
$$(3,3) = (2 * 512) + (0 * 64) + (0 * 8) + (1 * 1) = 1025$$

Figure 1.

So, the data statement would be:

    DATA 128,138,2,72,513,16,640,66,1025

and the I and J loops would have to be changed accordingly; J is the X width, and I is the Y width. Here, they'd both be a big 3.
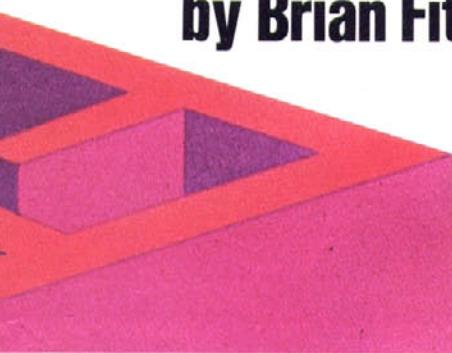
What we're doing is forming sixteen-bit numbers out of four three-bit numbers. Cell (3,3) is really:

	sp	n	e	s	w		
(3,3)	0000	010	000	000	001	=	0000010000000001

and the multiplications are forming the decimal equivalents of those binary numbers. Why do we use such an elaborate encoding scheme? For space; it allows a larger maze in memory. Yeah, that's a glib answer, but it's important to think of when doing these things. Optimize if you can; if you can't, do it anyway.

The Speed of Life. So we've paid our dues and now it's time for

by Brian Fitzgerald

life in the fast lane. Fast, you say? Yeah, it's kinda slow in Applesoft, ain't it? Pretty, but impractical. So what do we do? Machine language.

Wow, that's a lot faster!

The source listing for the complete plotter up to this point is available on disk, care of this magazine, with a few comments relating it to specific line numbers. If you want to use that, it was written on the *S-C Assembler*; see appropriate manuals for conversion to your favorite assembler's conventions.

Listing 1 is a hexadecimal dump of the up-to-date plotter object code; listing 2 is an Applesoft program that calls the machine language plot.

What do you do with the object code hex dump? Put it in the computer. Here's how to enter it.

Type *call −151* to enter the Monitor. Then type in the hex dump.

Type *bsave Bfillplot,A$6000,L$7AF*, then enter the Applesoft program in listing 2 and change line 20 to read in the machine language program.

Hplot Thickens. Now let's make a stab at explaining the machine code. It was written by hand translating the Applesoft program line by line: a cheap compiler. The task was made easy by the lack of hard arithmetic and simplified (for the machine) data structure. In fact, this is why the data for the maze was built so "strangely" from a high-level language viewpoint. Bit manipulation and field masking are jobs more suited to the machine than to the virtual languages that run on it.

If that makes no sense to you, that's fine; let's keep going. The loops and etceteras will have to go unexplained; ask Roger Wagner if you want to know. The graphics are actually the Applesoft routines—sneaky, huh? Here they are.

```
HPOSN is JSR $F457
HLIN is JSR $F53A
HCOLOR is $F6EC
```

For example, hplot 10,17 to 192,17 would be:

```
LDY #$00   (x hi)
LDX #$0A   (x lo)
LDA #$11   (y )
JSR HPOSN
LDX #$00   (x hi)
LDA #$c0   (x lo)
LDY #$11   (y )
JSR HLIN
```

Note that the order for loading the registers is different between HPOSN and HLIN. HCOLOR goes like this:

```
LDX #$01   (color code for green)
JSR HCOLOR
```

The source code has comments telling what part of the code is what Applesoft line.

And just think: The Applesoft routines are kinda slow, so this is only the beginning. Speed! Optimize! Make it playable!

And Now, the End Is Near. Time for a recap. What have we done so far? Plotted a 3-D maze and colored the walls, floors, and ceilings. Nothing terribly hard, eh? If you'll remember back to the end of the first article, we mentioned several problems. Now, with everything filled in, these problems become even more glaring. What is causing them?

Answer: tunnel vision is killing us. Example: We have a 3 x 3 room and are standing at the middle of one wall. What do we see? Let's go through it on paper.

The cell we're in (the peripheral cell) has no left or right walls, so we go to the cells to the left and right and look. But they have no front-facing walls, so we draw nothing.

The cell in front of us has no left or right walls, and looking to the left and right of that cell we again find no walls to draw. Oh, well.

Finally, we get to the cell two spots in front of us. Again, it has no left or right walls, but this time the cells to the left and right have front-facing walls to draw. So we draw them and go back to the cell we started with at the beginning of this paragraph, only to find that this is the end of our dusty trail, so we square it off and return.

But we have a problem. Those front-facing walls on the left and right extend half the distance of the middle wall; but we did that on purpose so we could have everything right. Unfortunately, this only works on corridors that are one cell wide, because now we have an extra distance to cover. What do we do?

Again, the answer—but it's not that simple. We have to maintain a list of all the (X1,Y1) to (X8,Y8) pairs that we generate when going down the corridor and then backtrack so we can cover all the open space. If there's one open space, we fill a half wall. If there are two open spaces, we make a half wall plus half a half wall; that is three-fourths of a wall. And so on.

That is for next time. While you wait, see if you can work on it by yourself. Call for help if you wish. And don't forget an up and coming topic: incremental plotting! Everyone cheer.

Don't forget also that you can send a self-addressed, stamped disk to The Amazing Maze, Softline, Box 60, North Hollywood, CA 91603, and get all the current programs on it without all that typing. This is a limited-time offer and will only last until the heat-death of the universe, which may never happen if certain people are able to prove that entropy is a vicious lie.

So there.
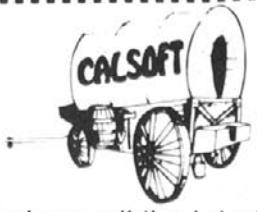
Listing 1.

6000:	4C	37	67	20	7D	67	A2	03
6008:	20	EC	F6	A2	13	BD	23	60
6010:	9D	00	03	CA	10	F7	A5	08
6018:	8D	14	03	A5	09	8D	15	03
6020:	4C	8C	60	1B	01	B7	01	B7

```
6028:  9D  1B  9D  29  0F  A9  0F  A9        6250:  AD  06  03  6D  20  03  AC  07
6030:  8F  29  8F  69  4F  02  12  18        6258:  03  20  3A  F5  A0  00  18  AD
6038:  AD  00  03  6D  10  03  6A  8D        6260:  00  03  6D  20  03  AA  AD  01
6040:  08  03  8D  0E  03  18  AD  02        6268:  03  20  57  F4  A2  00  AC  09
6048:  03  6D  10  03  6A  8D  0A  03        6270:  03  18  AD  00  03  6D  20  03
6050:  8D  0C  03  18  AD  01  03  6D        6278:  20  3A  F5  CE  20  03  CE  20
6058:  11  03  6A  8D  09  03  8D  0B        6280:  03  AD  20  03  10  B7  20  03
6060:  03  18  AD  05  03  6D  11  03        6288:  67  AD  16  03  8D  18  03  AD
6068:  6A  8D  0D  03  8D  0F  03  38        6290:  17  03  8D  19  03  20  37  67
6070:  AD  08  03  ED  00  03  6A  6A        6298:  A4  4B  B9  1B  03  C9  01  F0
6078:  29  3F  8D  12  03  38  AD  07        62A0:  8D  C9  00  F0  6A  A5  4C  C5
6080:  03  ED  01  03  6A  6A  6A  29        62A8:  4D  D0  27  A0  00  A2  1E  A9
6088:  1F  8D  13  03  38  A5  4B  E9        62B0:  1F  20  57  F4  A2  00  A9  1E
6090:  01  B0  02  A9  03  85  4A  38        62B8:  A0  8F  20  3A  F5  A0  00  A2
6098:  AD  10  03  ED  0E  03  E9  01        62C0:  1C  A9  1F  20  57  F4  A2  00
60A0:  8D  20  03  A0  00  18  AD  0E        62C8:  A9  1C  A0  8F  20  3A  F5  4C
60A8:  03  6D  20  03  AA  AD  0F  03        62D0:  0F  63  38  AD  08  03  ED  00
60B0:  20  57  F4  A2  00  AC  07  03        62D8:  03  ED  12  03  E9  03  8D  20
60B8:  18  AD  0E  03  6D  20  03  20        62E0:  03  A0  00  18  AD  00  03  6D
60C0:  3A  F5  A0  00  18  AD  08  03        62E8:  20  03  AA  18  AD  09  03  6D
60C8:  6D  20  03  AA  AD  01  03  20        62F0:  12  03  20  57  F4  A2  00  AC
60D0:  57  F4  A2  00  AC  09  03  18        62F8:  0F  03  18  AD  00  03  6D  20
60D8:  AD  08  03  6D  20  03  20  3A        6300:  03  20  3A  F5  CE  20  03  CE
60E0:  F5  CE  20  03  CE  20  03  AD        6308:  20  03  AD  20  03  10  D2  38
60E8:  20  03  10  B7  AD  14  03  8D        6310:  AD  08  03  ED  00  03  E9  02
60F0:  18  03  AD  15  03  8D  19  03        6318:  8D  20  03  A0  00  18  AD  00
60F8:  20  37  67  A4  4A  B9  1B  03        6320:  03  6D  20  03  AA  AD  09  03
6100:  C9  01  D0  03  4C  31  62  C9        6328:  20  57  F4  A2  00  18  AD  00
6108:  00  D0  03  4C  8F  61  A5  4C        6330:  03  6D  20  03  AC  0F  03  20
6110:  C5  4D  D0  27  A0  00  A2  1E        6338:  3A  F5  CE  20  03  CE  20  03
6118:  A9  16  20  57  F4  A2  00  A9        6340:  AD  20  03  F0  02  10  D4  18
6120:  1E  A0  9A  20  3A  F5  A0  00        6348:  A5  4B  69  01  C9  04  90  02
6128:  A2  1C  A9  14  20  57  F4  A2        6350:  A9  00  85  4A  38  AD  0C  03
6130:  00  A9  1C  A0  9C  20  3A  F5        6358:  ED  10  03  E9  01  8D  20  03
6138:  4C  8F  61  38  AD  08  03  ED        6360:  A0  00  18  AD  10  03  6D  20
6140:  00  03  ED  12  03  ED  12  03        6368:  03  AA  AD  0D  03  20  57  F4
6148:  E9  01  8D  20  03  A0  00  18        6370:  A2  00  AC  05  03  18  AD  10
6150:  AD  00  03  6D  12  03  6D  20        6378:  03  6D  20  03  20  3A  F5  A0
6158:  03  AA  18  AD  01  03  6D  12        6380:  00  18  AD  10  03  6D  20  03
6160:  03  6D  13  03  6D  20  03  20        6388:  AA  AD  03  03  20  57  F4  A2
6168:  57  F4  A2  00  38  AD  07  03        6390:  00  AC  0B  03  18  AD  10  03
6170:  ED  12  03  ED  20  03  A8  18        6398:  6D  20  03  20  3A  F5  CE  20
6178:  AD  06  03  6D  12  03  6D  20        63A0:  03  CE  20  03  10  BA  AD  14
6180:  03  20  3A  F5  CE  20  03  CE        63A8:  03  8D  18  03  AD  15  03  8D
6188:  20  03  AD  20  03  10  BE  38        63B0:  19  03  20  37  67  A4  4A  B9
6190:  AD  08  03  ED  00  03  E9  02        63B8:  1B  03  C9  01  D0  03  4C  EC
6198:  8D  20  03  A0  00  18  AD  00        63C0:  64  C9  00  D0  03  4C  4A  64
61A0:  03  6D  20  03  AA  18  AD  01        63C8:  A5  4C  C5  4D  D0  27  A0  00
61A8:  03  6D  20  03  20  57  F4  A2        63D0:  A2  B4  A9  16  20  57  F4  A2
61B0:  00  38  AD  07  03  ED  20  03        63D8:  00  A9  B4  A0  9A  20  3A  F5
61B8:  A8  18  AD  06  03  6D  20  03        63E0:  A0  00  A2  B6  A9  14  20  57
61C0:  20  3A  F5  CE  20  03  CE  20        63E8:  F4  A2  00  A9  B6  A0  9C  20
61C8:  03  AD  20  03  30  02  D0  CB        63F0:  3A  F5  4C  4A  64  38  AD  02
61D0:  38  AD  08  03  ED  00  03  E9        63F8:  03  ED  0A  03  ED  12  03  ED
61D8:  01  8D  20  03  A0  00  18  AD        6400:  12  03  E9  01  8D  20  03  A0
61E0:  06  03  6D  20  03  AA  38  AD        6408:  00  18  AD  0A  03  6D  12  03
61E8:  07  03  ED  20  03  20  57  F4        6410:  6D  20  03  AA  18  AD  09  03
61F0:  A2  00  AC  07  03  18  AD  00        6418:  6D  13  03  38  ED  12  03  ED
61F8:  03  6D  20  03  20  3A  F5  A0        6420:  20  03  20  57  F4  A2  00  18
6200:  00  18  AD  00  03  6D  20  03        6428:  AD  0D  03  6D  12  03  6D  20
6208:  AA  AD  01  03  20  57  F4  A2        6430:  03  A8  18  AD  0C  03  6D  12
6210:  00  18  AD  01  03  6D  20  03        6438:  03  6D  20  03  20  3A  F5  CE
6218:  A8  18  AD  00  03  6D  20  03        6440:  20  03  CE  20  03  AD  20  03
6220:  20  3A  F5  CE  20  03  CE  20        6448:  10  BD  38  AD  02  03  ED  0A
6228:  03  AD  20  03  10  AE  4C  47        6450:  03  E9  02  8D  20  03  A0  00
6230:  63  38  AD  08  03  ED  00  03        6458:  18  AD  0A  03  6D  20  03  AA
6238:  E9  01  8D  20  03  A0  00  18        6460:  38  AD  0B  03  ED  20  03  20
6240:  AD  06  03  6D  20  03  AA  AD        6468:  57  F4  A2  00  18  AD  0D  03
6248:  0F  03  20  57  F4  A2  00  18        6470:  6D  20  03  A8  18  AD  0C  03
```

```
6478:   6D   20   03   20   3A   F5   CE   20
6480:   03   CE   20   03   AD   20   03   30
6488:   02   D0   CB   38   AD   04   03   ED
6490:   0C   03   E9   01   8D   20   03   A0
6498:   00   18   AD   0C   03   6D   20   03
64A0:   AA   18   AD   0D   03   6D   20   03
64A8:   20   57   F4   A2   00   AC   05   03
64B0:   18   AD   0C   03   6D   20   03   20
64B8:   3A   F5   A0   00   18   AD   0A   03
64C0:   6D   20   03   AA   AD   03   03   20
64C8:   57   F4   A2   00   38   AD   0B   03
64D0:   ED   20   03   A8   18   AD   0A   03
64D8:   6D   20   03   20   3A   F5   CE   20
64E0:   03   CE   20   03   AD   20   03   10
64E8:   AE   4C   0F   66   38   AD   04   03
64F0:   ED   0C   03   E9   01   8D   20   03
64F8:   A0   00   18   AD   0C   03   6D   20
6500:   03   AA   AD   0D   03   20   57   F4
6508:   A2   00   AC   05   03   18   AD   0C
6510:   03   6D   20   03   20   3A   F5   A0
6518:   00   18   AD   0A   03   6D   20   03
6520:   AA   AD   03   03   20   57   F4   A2
6528:   00   AC   0B   03   18   AD   0A   03
6530:   6D   20   03   20   3A   F5   CE   20
6538:   03   CE   20   03   AD   20   03   10
6540:   B7   20   03   67   AD   16   03   8D
6548:   18   03   AD   17   03   8D   19   03
6550:   20   37   67   A4   4B   B9   1B   03
6558:   C9   01   D0   03   4C   0F   66   C9
6560:   00   F0   74   A5   4C   C5   4D   D0
6568:   27   A0   00   A2   B4   A9   1F   20
6570:   57   F4   A2   00   A9   B4   A0   8F
6578:   20   3A   F5   A0   00   A2   B6   A9
6580:   1F   20   57   F4   A2   00   A9   B6
6588:   A0   8F   20   3A   F5   4C   D7   65

6590:   38   AD   02   03   ED   0A   03   ED
6598:   12   03   E9   01   8D   20   03   A0
65A0:   00   18   AD   0A   03   6D   12   03
65A8:   6D   20   03   AA   18   AD   0B   03
65B0:   6D   12   03   20   57   F4   A2   00
65B8:   AC   0F   03   18   AD   0A   03   6D
65C0:   12   03   6D   20   03   20   3A   F5
65C8:   CE   20   03   CE   20   03   AD   20
65D0:   03   30   04   C9   01   D0   C8   38
65D8:   AD   02   03   ED   0A   03   E9   02
65E0:   8D   20   03   A0   00   18   AD   0A
65E8:   03   6D   20   03   AA   AD   0B   03
65F0:   20   57   F4   A2   00   18   AD   0A
65F8:   03   6D   20   03   AC   0F   03   20
6600:   3A   F5   CE   20   03   CE   20   03
6608:   AD   20   03   30   02   D0   D4   A2
6610:   07   BD   08   03   9D   00   03   CA
6618:   10   F7   AD   14   03   8D   18   03
6620:   AD   15   03   8D   19   03   20   37
6628:   67   A4   4B   B9   1B   03   C9   01
6630:   D0   2B   18   A5   4B   6A   D0   0E
6638:   B0   06   CE   15   03   4C   51   66
6640:   EE   14   03   4C   51   66   B0   06
6648:   EE   15   03   4C   51   66   CE   14
6650:   03   C6   4C   A5   4C   D0   03   4C
6658:   02   67   4C   37   60   38   AD   0A
6660:   03   ED   08   03   E9   02   8D   20
6668:   03   A0   00   18   AD   08   03   6D
6670:   20   03   AA   AD   09   03   20   57
6678:   F4   A2   00   18   AD   08   03   6D
6680:   20   03   AC   0F   03   20   3A   F5
6688:   CE   20   03   CE   20   03   AD   20
6690:   03   30   02   D0   D4   A4   4B   B9
6698:   1B   03   C9   02   D0   64   38   AD
66A0:   02   03   ED   00   03   6A   6A   6A
```

```
10    PRINT CHR$ (4);"BLOAD BFILLPLOT2"
30    HOME
40    VTAB 10: HTAB 6: PRINT "THE MOUNDS OF CTEIA"
50    REM *********** MAZE:3D-PLOTTER
60    GOSUB 3000
70    D = 2:XC = 0:YC = 0:RR = 5
80    SP = 0
90    HOME : VTAB 23: HTAB 35: IF D = 1 THEN PRINT "N";
100   IF D = 2 THEN PRINT "E"
110   IF D = 3 THEN PRINT "S"
120   IF D = 4 THEN PRINT "W"
130   VTAB 24: HTAB 20: PRINT XC;" ";YC;
140   R = RR: GOSUB 1000
150   IF SP    0 THEN 190
160   XX = XC:YY = YC: GOSUB 1600: IF S = 0 THEN 190
170   SP = 1
180   ON S GOTO 2000,2200,2400,2600
190   VTAB 22: HTAB 1: PRINT "MOVE   ";
200   VTAB 22: HTAB 7: GET A$
210   IF A$ = CHR$ (8) THEN 270
220   IF A$ = CHR$ (21) THEN 290
230   IF A$ = ";" THEN 310
240   IF A$ = "T" THEN 410
250   IF A$ = "/" THEN 330
260   GOTO 200
270   D = D - 1: IF D = 0 THEN D = 4
280   GOTO 90
290   D = D + 1: IF D = 5 THEN D = 1
300   GOTO 90
310   XX = XC:YY = YC: GOSUB 1600:P = D: IF T(D)    0 THEN
      350
320   PRINT CHR$ (7): GOTO 200
330   XX = XC:YY = YC: GOSUB 1600:P = D - 2: PRINT P: IF P    1

      THEN P = P + 4
340   IF T(P) = 0 THEN 320
350   SP = 0
360   IF P = 1 THEN YC = YC - 1
370   IF P = 2 THEN XC = XC + 1
380   IF P = 3 THEN YC = YC + 1
390   IF P = 4 THEN XC = XC - 1
400   GOTO 90
410   HOME : VTAB 22: HTAB 1
420   INPUT "TELEPORT TO (X,Y) ";XC,YC
430   GOTO 90
1000  POKE 8,XC: POKE 9,YC: POKE 76,R: POKE 77,R: POKE 75,D
      - 1
1010  CALL 24579
1020  RETURN
1600  POKE 792,XX: POKE 793,YY
1605  CALL 24576
1610  S = PEEK (794)
1615  FOR I = 1 TO 4:T(I) = PEEK (794 + I): NEXT I
1620  RETURN
2000  HOME : VTAB 21: HTAB 1
2010  PRINT "THOU HAST THE TEMERITY TO ENTER MY"
2020  PRINT "DEMESNES?!"; CHR$ (7);" THEN SUFFER"
2030  PRINT "THY FOUL CONSEQUENCE OF FOLLY!!!"
2040  VTAB 10: GET A$
2050  HOME
2060  XC = 2:YC = 2: GOTO 90
2200  HOME : VTAB 21: HTAB 1
2205  PRINT "YOU FIND A ROLLED-UP SCROLL, ENCRUSTED"
2210  PRINT "WITH EMERALDS, AND EMBLAZONED WITH THE"
2215  PRINT "SIGNET OF TUR AP MOLL. WILL YOU READ"
2220  INPUT "IT? ";A$
2230  IF A$ = "" OR LEFT$ (A$,1) = "N" THEN 2300
```

```
66A8:    29   1F   8D   12'  03   38   AD   07
66B0:    03   ED   01   03   6A   6A   6A   29
66B8:    1F   8D   13   03   38   AD   0A   03
66C0:    ED   08   03   ED   12   03   ED   12
66C8:    03   E9   01   8D   20   03   A0   00
66D0:    18   AD   08   03   6D   12   03   6D
66D8:    20   03   AA   18   AD   09   03   6D
66E0:    13   03   20   57   F4   A2   00   AC
66E8:    0F   03   18   AD   08   03   6D   12
66F0:    03   6D   20   03   20   3A   F5   CE
66F8:    20   03   CE   20   03   AD   20   03
6700:    10   CC   60   AD   14   03   8D   16
6708:    03   AD   15   03   8D   17   03   A5
6710:    4A   18   6A   F0   0E   90   06   CE
6718:    16   03   4C   2E   67   EE   17   03
6720:    4C   2E   67   B0   06   CE   17   03
6728:    4C   2E   67   EE   16   03   60   18
6730:    6A   A8   A9   00   6A   AA   60   AD
6738:    19   03   20   2F   67   98   09   40
6740:    85   07   8A   6A   0D   18   03   0A
6748:    85   06   A0   00   B1   06   6A   6A
6750:    6A   6A   29   0F   8D   1A   03   B1
6758:    06   6A   29   07   8D   1B   03   A0
6760:    01   B1   06   2A   2A   2A   29   07
6768:    8D   1C   03   B1   06   6A   6A   6A
6770:    29   07   8D   1D   03   B1   06   29
6778:    07   8D   1E   03   60   A9   20   85
6780:    E6   AD   50   C0   AD   53   C0   AD
6788:    57   C0   AD   54   C0   A9   20   85
6790:    07   A0   00   84   06   A9   00   91
6798:    06   C8   D0   FB   E6   07   A5   07
67A0:    C9   40   D0   F1   60   60   60   60
67A8:    60   60   60   60   60   60   60   60
```

Listing 1.
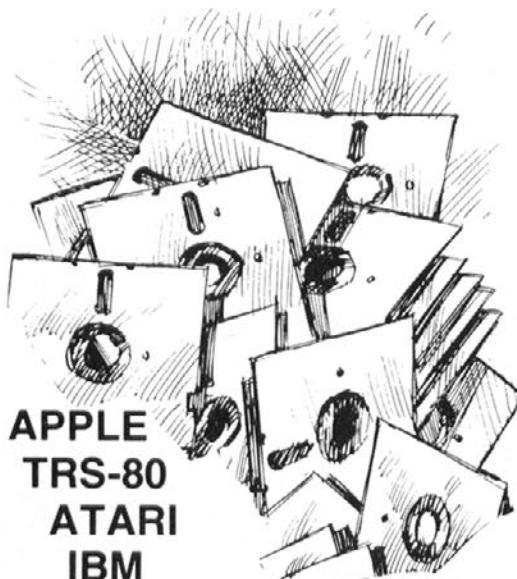
```
2235   PRINT : PRINT "IT SAYETH . . . "
2240   PRINT : FOR I = 1 TO 300: NEXT I
2245   PRINT "NOTHING MUCH. OH WELL"
2250   GET A$
2300   GOTO 90
3000   FOR I = 1 TO MY
3040   FOR I = 1 TO MY
3050   FOR J = 1 TO MX
3060   READ K
3130   IF K    0 THEN K = K + 65536
3140   K2 = INT (K / 256):K1 = K — K2 * 256
3145   A = 16254 + I * 128 + J * 2
3150   POKE A,K2: POKE A + 1,K1
3160   NEXT J,I
3170   RETURN
3200   DATA 72,65,81,73,17,72,9,72,73,9
3210   DATA 520,72,1033,520,1096,513,
       576,513,512,520
3220   DATA 520,576,513,520,520,8,128,74,9,520
3230   DATA 584,65,65,513,576,577,1,
       576,513,520
3240   DATA 520,64,129,74,9,64,137,74,1,520
3250   DATA 520,72,9,592,529,80,
       513,512,80,513
3260   DATA 648,514,576,1025,1032,
       1088,137,74,1097,9
3270   DATA 640,66,129,66,577,65,
       521,576,577,513
3280   DATA 136,74,137,10,72,65,577,
       65,9,8
3290   DATA 512,576,513,576,577,
       65,65,1,576,513
```

Listing 2.   SL

Reading, Riting, Returning, and Reset

by Sherwin Steffin

In a computer world of precise electronic signals, specific results, and repeatable phenomena, the phrase *computer literacy* is an elusive phantom. Computer literacy has been identified as the "fourth R," as an essential skill in an increasingly complex technological society, and as a requirement for certification of high schools by the university accrediting agencies.

Although microcomputers have been in a number of our public schools for more than four years now, there has yet to be anything approaching a universally accepted definition of computer literacy. Everyone wants it, but no one knows what it is. There is, however, a prevailing notion that if a computer, a child, a teacher, and some instructional materials are put into close proximity the result will be some knowledge about using the computer.

During the sixties and seventies a similar term, *visual literacy*, found its way into the English and media departments of some secondary schools. In an effort to promote the use of visual materials, various interested parties strongly maintained that learners were visually illiterate. Photography classes, visual perception classes, and, later, television production classes became, in some educational settings, a part of traditional curricula. The same kind of question, "What is visual literacy," was often asked and seldom answered. Ultimately, visual literacy organizations developed some definitions that were generally accepted.

This article proposes several working definitions of computer literacy and suggests some strategies for acquiring this "fourth R."

What Is It? Computer literacy is often thought of as a single, all-encompassing skill. Analysis reveals that computer literacy is actually a complex of many skills. In broad terms, four skill areas are involved in becoming fully computer literate—the ability, given ready-to-use software, to operate a computer and to utilize software effectively; the ability to describe and/or explain the components, operation, and uses of a computer; the ability to use a machine-specific programming language to program a computer to perform a specific task; and the ability to manipulate programming tools in order to move from one computer to another, using a variety of programming languages.

It's obvious that the last set of skills won't be achieved by all computer users or all students. Mastery of each of these four areas rests with the learner's age, ability, interest, and opportunities. Many people will attain the first and second levels of the skills described above. A somewhat smaller group will achieve the third level, and the fourth level will be the domain of those who become computer professionals.

How Can We Acquire It? As more software becomes available for children of preschool and primary school age, more and more of them will have the opportunity to explore the computer and its capabilities. Self-instructional software makes the first component of computer literacy relatively easy to achieve. Most children are immersed in video games and are intent on mastering game-playing skills with the computer. As the designs of keyboards and software become more sophisticated, children will be able to use the terminal with almost no assistance.

Clearly, the ability to explain, describe, and apply knowledge of the computer and how it works requires language skills. But even young children can master the concept of processing information sequentially. Programs that teach information sequencing can be designed to require little or no verbal or printed instructions. Graphic, visual, or tactile media can be used so that even children can acquire the concepts of data processing, even if they haven't yet learned to read.
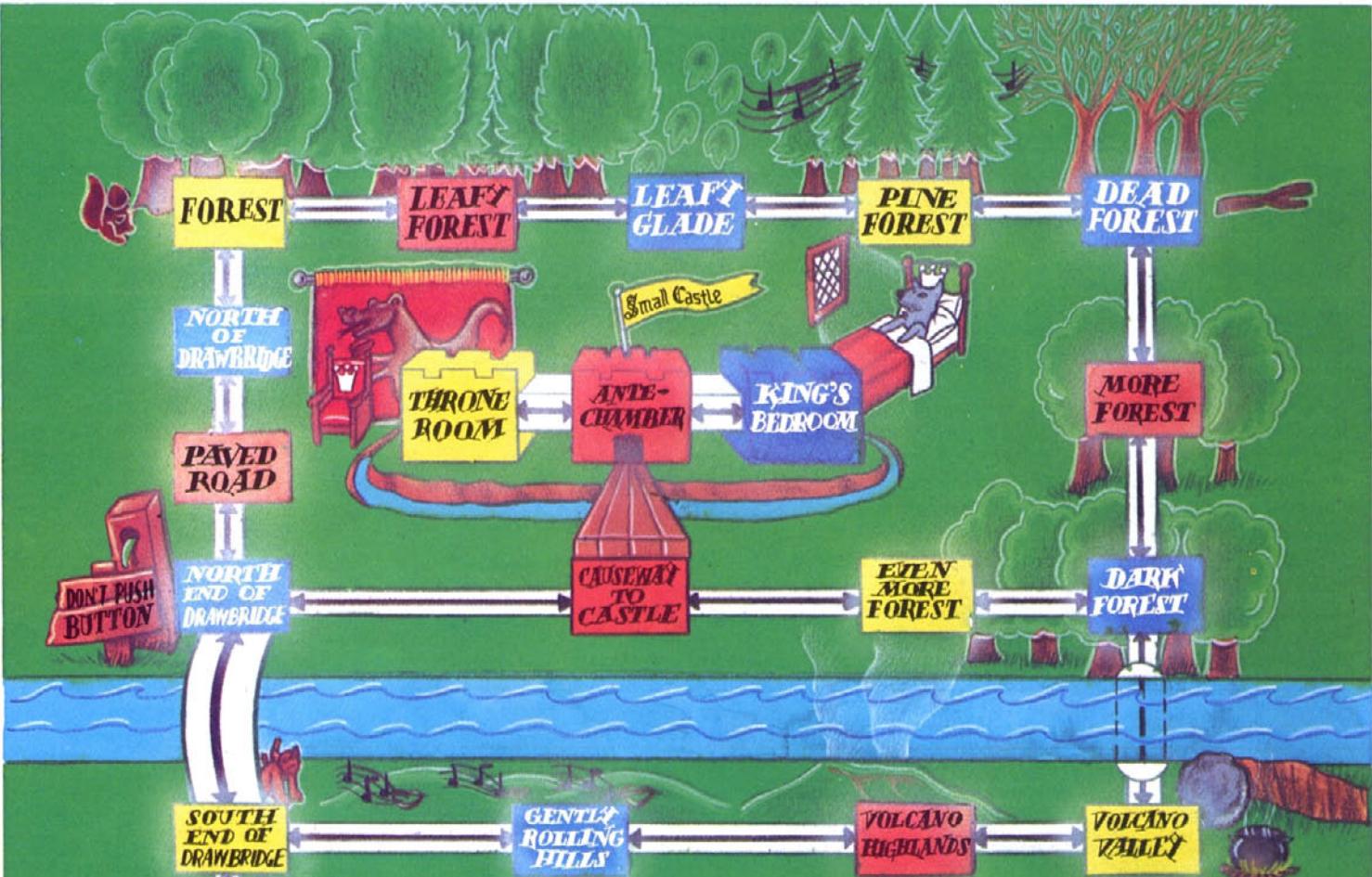
Both parents and teachers can help young children use some application software. Two varieties are especially suited to this purpose: the spreadsheet and the word processor. As soon as children begin to perceive that the world consists of discrete units, they can be introduced, through mathematical concepts, to the question "What if?" For example, a child can assess the consequences of spending all of her allowance, saving some portion of it, or redistributing her money resources. In this way, constructs such as dependent and independent variables can be introduced in understandable terms.

Word processing has enormous potential for helping kids master certain language skills. Many youngsters have a great deal of difficulty learning to take notes, outline information, and abstract ideas from a mass of material. An easy-to-use word processor can make their manipulation of language more manageable. A word processor gives the child the opportunity to reformat his outlines without demanding that all his work be recopied. The child who can draft his own reports and assignments, print them out, and then correct them himself without recopying is at a distinct advantage. Children who take this opportunity can perceive the computer as having value to them far beyond sheer entertainment.

Formal programming classes, whether they take place in the schools, at computer stores, or as part of a computer camp or other recreation, can help students at the middle elementary and high school levels learn programming skills. In addition, as children enter adolescence, they're motivated to a large extent by peer opinion. Programming skills have become a part of today's adolescent culture, at least in the homes of those students whose families have discretionary income, and are seen as a way to achieve the recognition of one's peers. The ability to write games, and the potential for commercial authorship, have become sources of respect and admiration.
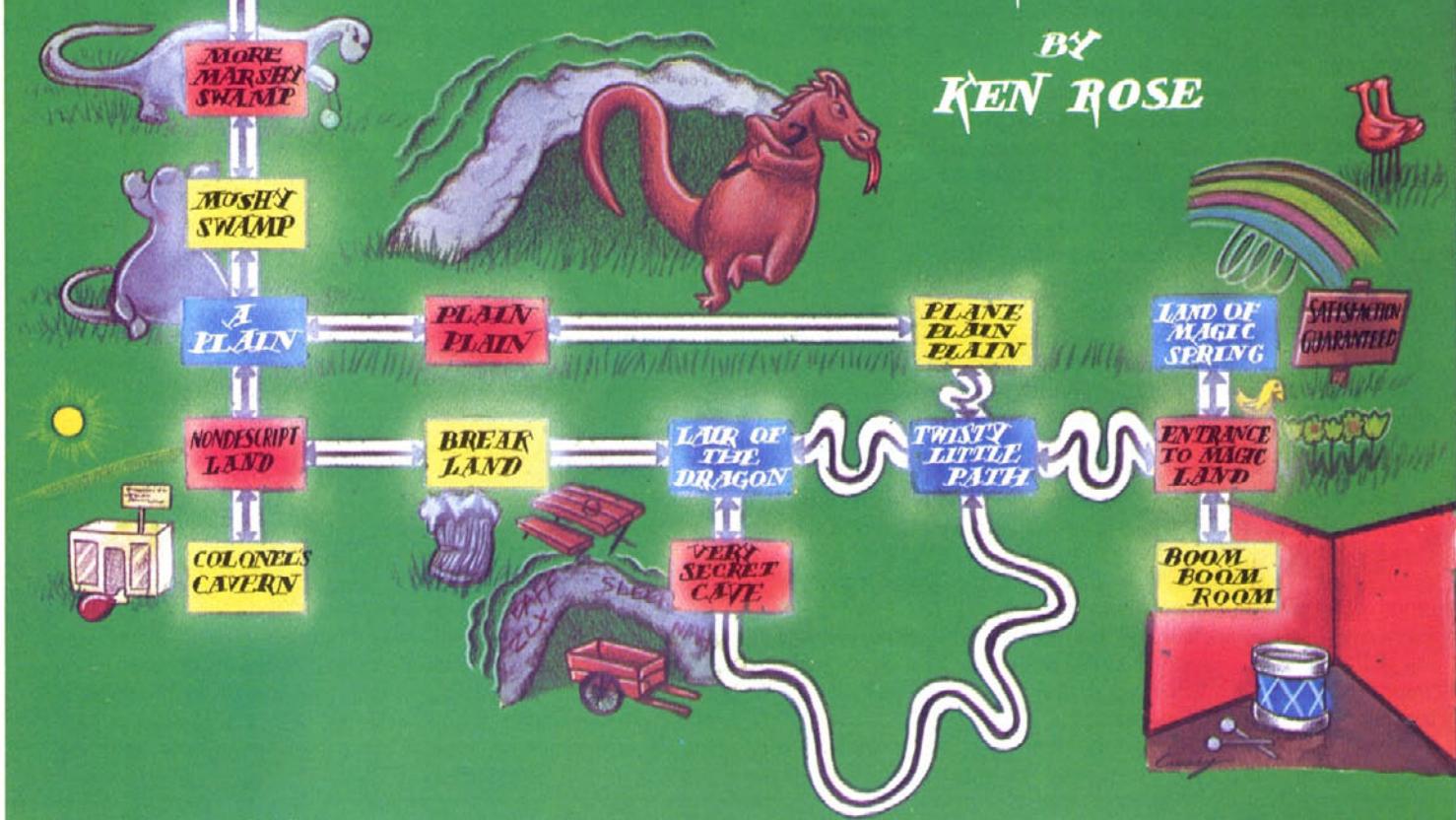
It's less likely that the skills required for dealing with multiple computers, complex operating systems, and the other challenges that professional computing presents will be developed through formal training before the post-secondary level. This doesn't mean that these skills can't be acquired, however. More and more often, high school students are finding employment as programmers or programming interns in software publishing settings.

Summing Up. As we move deeper into the computer age, we're challenged to help a population, almost completely without knowledge of the computer, to become fluent in this powerful new tool. In the course of this article, we've identified four skill levels and described the kinds of environments that foster the mastery of these requisite skills in computer operation and literacy. Such computer literacy will, we suggest, be derived from a variety of sources, including the school, the home, and the learner's own motivation to gain mastery and understanding. SL

FOREST — LEAFY FOREST — LEAFY GLADE — PINE FOREST — DEAD FOREST

NORTH OF DRAWBRIDGE

Small Castle

THRONE ROOM — ANTE-CHAMBER — KING'S BEDROOM

MORE FOREST

PAVED ROAD

DON'T PUSH BUTTON

NORTH END OF DRAWBRIDGE — CAUSEWAY TO CASTLE — EVEN MORE FOREST — DARK FOREST

SOUTH END OF DRAWBRIDGE — GENTLY ROLLING HILLS — VOLCANO HIGHLANDS — VOLCANO VALLEY

ADVENTURES IN ADVENTURING
BASICALLY, ANOTHER ADVENTURE
BY KEN ROSE

MARSHY SWAMP

MORE MARSHY SWAMP

MUSHY SWAMP

A PLAIN — PLAIN PLAIN — PLANE PLAIN PLAIN — LAND OF MAGIC SPRING — SATISFACTION GUARANTEED

NONDESCRIPT LAND — BREAK LAND — LAIR OF THE DRAGON — TWISTY LITTLE PATH — ENTRANCE TO MAGIC LAND

COLONEL'S CAVERN — VERY SECRET CAVE — BOOM BOOM ROOM

It's test time!

Why, you say?

Well, a couple of reasons.

First, if you've been following these articles, it's time to pull everything together and produce a full-fledged, exciting, fun-filled adventure game.

Second (and this is the real reason), we've been receiving a great deal of mail asking how these adventures, written for the Apple II, can be converted to run on other computers.

We'll have a bit of fun, then, testing your patience by recapping where we've been and presenting this program in Atari Basic, with notations as to how it may be translated into Applesoft.

At the end of this exercise, you will have in your possession a most fearsome adventure called: *The Horrible Rotten Dancing Dragon . . . Strikes!!!*

The structure of the program is:

Lines	10–90	Initialization routines
Lines	100–200	Parser
Lines	300–1450	Verb-handling routines
Lines	1500–2160	Descriptions
Lines	2200–2410	Noun-handling routines
Lines	2500–2830	Data statements
Lines	3000–3700	Special situations

As written, the program requires about 18,600 bytes of memory. A computer having 16K of memory actually has 16,384 bytes of memory available, but a computer with greater than 16K of memory is needed for this program. The Atari 400 is a 16K machine, so *The Horrible Rotten Dancing Dragon . . . Strikes!!!* doesn't quite fit. But don't despair; there is a way to make it fit.

Throughout the program you'll see what are called *remark statements*. You can recognize them in that they are prefaced by the letters rem. They may either be on a separate line or part of another line.

For example, line 10 reads:

10 REM ANOTHER ADVENTURE FROM SOFTLINE

Any line that starts with a rem may be omitted; it is not needed to run the program.

Line 20 says:

20 PRINT CHR$ (125):REM THIS CLEARS THE SCREEN

All the program needs is:

20 PRINT CHR$ (125)

By removing the remark statements, you can make the program fit into 16K of memory.

Initialization. Line 20 clears the screen. For the Atari, the command is *print CHR$(125)*. For Applesoft, substitute the word *home*.

Line 30 dimensions arrays. For the Atari, strings (which are the variables that contain letters as well as numbers) must be dimensioned for the number of characters they will handle. Applesoft does not need this, so for Applesoft line 30 should read:

30 DIM N(34),S(34),E(34),W(34),RD(34)

No other changes are needed in the initialization section.

Parser. The ways Atari Basic and Applesoft strings can be manipulated differ. In an earlier article, "Please Parse the Zork," we developed the Applesoft parser. For Applesoft, lines 100 through 200 should read:

```
100 REM PARSER
110 V1$ = "":N1$=""
120 PRINT :PRINT "WHAT NOW? ":INPUT "";A$
130 HOME : PRINT DES$
140 FOR A = 1 TO LEN (A$)
150 IF MID$ (A$,A,1) = " " THEN X = A – 1: A = 0: GOTO 180
160 NEXT A
170 V1$ = A$: GOTO 300
180 V1$ = LEFT$ (A$,X)
190 IF RIGHT$ (A$, LEN(A$) – X) = " " THEN N1$ = "": GOTO
    300:REM BE SURE THERE IS A SPACE BETWEEN THE FIRST
    PAIR OF QUOTES AND NO SPACE BETWEEN THE SECOND
    PAIR OF QUOTES
200 N1$ = RIGHT$ (A$, LEN (A$) – (X+1)): GOTO 300
```

For you Atari Basic lovers, this is how your parser works:

Line 110 clears the verb and noun variables, respectively.

Line 120 asks for a command and puts it into A$.

Line 130 clears the screen and prints the room description (contained in variable DES$) on top of the screen.

Line 140 checks to see if there is anything in the variable A$. If, for example, you pressed the return key in response to line 120, the program would move along. However, A$ would not really contain anything and the program would stop running (bomb out) in line 150. Line 140 prevents this from happening. This line is not needed in the Apple II version of the parser.

Line 150 starts a for-next loop, which will break A$ down into a verb (V1$) and a noun (N1$).

Line 160 inside the loop looks at each character to see if it is a space (" "). If it is, then V1$ becomes all the characters up until that space and N1$ becomes all the characters after that space. The variable A is cleared and the program moves on to the verb-handling routine at line 300.

Line 170 is the other end of the for-next loop.

Line 180 is used if no space was found when the loop checked the characters in the variable A$. If no blank was found, it means this was a one-word command such as *north*. Since legitimate one-word commands are always verbs, the value of A$ must be put into the verb variable V1$.

Verb-Handling Routines. These can be exactly the same for the Atari and the Apple. The Atari allows 114 characters in a command line. This is exactly three display lines. The Apple allows 255 characters, more than six display lines, in a command line.

Since this program is written for the Atari, it is formatted to use no more than three thirty-eight character lines in a command line.

Lines 610 through 618 send the program to the subroutine that displays the room message. Since all the subroutine destinations wouldn't fit on one line, line 612 contains the first nineteen destinations and line 618 contains the last fourteen of the total thirty-three rooms.

After the room direction routine (see "From Here to There and Back Again" in the May 1982 *Softline* for a complete explanation), variable R tells us which room we want to go to and line 610 sees if the room number is greater than 19. If it isn't, line 612 is used to send the program to the correct subroutine. If the room number is greater than 19, the program goes to line 618, subtracts 19 from the variable R, and then continues on to the proper room number subroutine.

Descriptions. As mentioned a moment ago, the Atari screen can contain thirty-eight characters as compared to the Apple's forty. Descriptions that are formatted for the Atari won't quite come out right on the Apple screen, so we didn't format the print statements at all. To make the long descriptions look right on either computer, type the line until your cursor is underneath the opening quote of the previous screen line. If a word starts on one side of the quote and ends on the other, it will break funny when the program is run. Add a few spaces so that a word that would break wrong begins under the first character after the quotation mark.

Everything else in the program is straightforward, has been described in previous articles, and will run on either machine.

For other Basics, such as TRS-80, Commodore, IBM, or what have you, some other minor changes may be needed, but you should not have difficulty making them. If you do, drop *Softline* a line with specific problems.

Okay, gang; let's get going and punch in that program!

The Horrible Rotten Dancing Dragon . . . Strikes!!!

```
10  REM ANOTHER ADVENTURE FROM SOFTLINE
15  REM WRITTEN FOR THE ATARI BUT EASILY
    TRANSPORTABLE IF YOU READ THE ACCOMPANYING
    ARTICLE
20  PRINT CHR$(125):REM THIS CLEARS THE SCREEN
30  DIM N(34),S(34),E(34),W(34),OB(7),RD(34),
```

```
           A$(20),DES$(40),N1$(20),V1$(20)
40  OB(1)=5:OB(2)=22:OB(3)=25:OB(4)=31:OB(5)=27
    :OB(6)=33:OB(7)=32
50  REM READING DATA INTO THE ARRAYS
60  FOR A=1 TO 33
70  READ X:N(A)=X:READ X:S(A)=X:READ X:E(A)=X:READ
    X:W(A)=X:X=0:RD(A)=0
80  NEXT A
90  R=1:GOSUB 1500:GOTO 620
100   REM PARSER
110   V1$="":N1$=""
120   PRINT :PRINT "WHAT NOW? ";:INPUT A$
130   PRINT CHR$(125):PRINT DES$
140   IF LEN(A$)=0 THEN GOTO 100
150   FOR A=1 TO LEN(A$)
160   IF A$(A,A)=" " THEN
      V1$=A$(1,A-1):N1$=A$(A+1):A=0:GOTO 300
170   NEXT A
180   V1$=A$
300   REM VERB-HANDLING ROUTINE
310   IF V1$="GO" THEN V1$="N1$":GOTO 500
320   IF V1$="NORTH" OR V1$="N" OR V1$="SOUTH" OR
      V1$="S" OR V1$="EAST" OR V1$="E" OR V1$="WEST"
      OR V1$="W" THEN GOTO 500
330   IF V1$="INVENTORY" OR V1$="INV" OR V1$="I" THEN
      GOTO 700
340   IF V1$="GET" OR V1$="TAKE" THEN GOTO 800
350   IF V1$="PUSH" OR V1$="PRESS" THEN GOTO 900
360   IF V1$="DROP" THEN GOTO 1000
370   IF V1$="QUIT" THEN GOTO 3700
380   IF V1$="HIT" OR V1$="STRIKE" OR V1$="BEAT" OR
      V1$="KILL" THEN GOTO 1200
390   IF V1$="EAT" THEN GOSUB 1300:GOTO 100
400   IF V1$="FEED" OR V1$="GIVE" THEN GOTO 1400
410   IF V1$="DANCE" THEN GOTO 1100
420   PRINT :PRINT "I DON'T KNOW HOW TO ";V1$;".":GOTO
      100
500   REM MOVING AROUND ROUTINE
510   X=R:REM STORING CURRENT ROOM NUMBER
520   IF V1$="NORTH" OR V1$="N" THEN R=N(R)
530   IF V1$="SOUTH" OR V1$="S" THEN R=S(R)
540   IF V1$="EAST" OR V1$="E" THEN R=E(R)
550   IF V1$="WEST" OR V1$="W" THEN R=W(R)
560   IF X=28 AND R=32 THEN GOTO 590
570   IF R=28 AND S(28)=32 THEN GOTO 3570:REM RETURNING
      TO DRAGON'S CAVE
580   IF X=28 THEN GOTO 3590:REM TRAPPED IN DRAGON'S
      CAVE
590   IF R>0 THEN X=R:PRINT CHR$(125):GOTO 610:REM
      YOU'VE MOVED AND X WILL BE USED IN SEARCHING FOR
      OBJECTS
600   IF R=0 THEN PRINT :PRINT "YOU CAN'T MOVE THAT WAY
      (I THINK).":R=X:X=0:GOTO 100:REM ORIGINAL ROOM
      VALUE SETUP
610   IF R>19 THEN GOTO 618
612   ON R GOSUB 1510,1530,1550,1570,1590,1610,1630,
      1650,1670,1690,1710,1730,1750,1770,
      1790,1810,1830,1850,1870
615   GOTO 620
618   ON (R-19) GOSUB 1890,1910,1930,1950,1970,
      1990,2010,2030,2050,2070,2090,2110,2130,2150
620   PRINT :PRINT "OBJECTS HERE ARE:":PRINT
630   X=R:GOSUB 2300
640   X=0
650   GOTO 100
700   REM INVENTORY ROUTINE
710   X=34
720   PRINT :PRINT "YOU ARE CARRYING: ":PRINT
730   GOSUB 2300

740   GOTO 100
800   REM GET ROUTINE
810   IF N1$="" THEN PRINT :PRINT "DON'T BE SILLY, I NEED A
      NOUN!":GOTO 890
820   GOSUB 2200
830   IF OB(X)=R OR OB(X)=34 THEN GOTO 850
840   PRINT :PRINT "YOU CAN'T, AT THE MOMENT.":PRINT
      :GOTO 890
850   IF X=3 AND OB(7)<34 THEN GOTO 3410
860   OB(X)=34
870   IF OB(3)=34 THEN GOTO 3400
880   PRINT :PRINT "YOU'VE GOT THE ";N1$;".":PRINT
890   X=0:GOTO 100
900   REM PRESS ROUTINE
910   IF N1$="" THEN PRINT :PRINT "DON'T BE SILLY, I NEED A
      NOUN!":GOTO 890
920   IF R=11 OR R=18 THEN GOTO 940
930   GOTO 990
940   IF R=18 THEN GOTO 980
950   IF OB(1)=34 THEN GOTO 3060
960   IF N1$="BUTTON" THEN GOTO 3050
970   GOTO 3040
980   IF N1$="ROCK" OR N1$="STONE" THEN GOTO 3220
990   PRINT :PRINT "I CAN'T ";V1$;" A ";N1$;".":PRINT :GOTO
      100
1000  REM ROUTINE TO DROP OBJECTS
1010  GOSUB 2200
1020  IF OB(X)=34 THEN GOTO 1040
1030  PRINT :PRINT "I'M NOT CARRYING THE ";N1$;".":PRINT
      :GOTO 1080
1040  OB(X)=R
1050  IF N1$="WAGON" AND OB(7)=R THEN GOTO 3420
1060  PRINT :PRINT "I'VE DROPPED THE ";N1$;".":PRINT
1070  IF R=28 AND OB(X)=28 THEN OB(X)=0:GOTO 3580:REM
      THE DRAGON'S GONNA EAT IT
1080  X=0
1090  GOTO 100
1100  REM DANCE ROUTINE (SO TO SPEAK)
1110  PRINT :PRINT "YOU START TO HUM A CATCHY LITTLE
      TUNE. YOU GRACEFULLY LEAP UP IN THE AIR, DO A
      PIROUETTE, LAND,";
1115  PRINT "DO A CARTWHEEL,":PRINT "AND TAKE A BOW."
1120  IF R=28 THEN GOTO 3530
1130  PRINT :PRINT "FURRY LITTLE CREATURES APPEAR,
      APPLAUD FURRIOUSLY, AND LEAVE."
1140  GOTO 100
1200  REM BEATING AND HITTING ROUTINES
1210  IF N1$="" THEN PRINT :PRINT "OKAY, BUT YOU HAVE TO
      TELL ME WHAT IT IS YOU WANT TO ";V1$;".":PRINT
      :GOTO 100
1220  IF R=9 AND OB(7)<34 THEN GOTO 3310
1230  IF R=18 AND OB(2)=34 THEN GOTO 3230
1240  IF R=18 THEN GOTO 3250
1250  IF N1$="DRUM" OR N1$="DRUMSTICK" THEN GOTO
      3320
1260  IF R=28 AND OB(2)=34 THEN GOTO 3550
1270  IF R=28 THEN GOTO 3560
1280  PRINT :PRINT "YOU CAN'T ";V1$;" A ";N1$;
      " HERE.":GOTO 100
1300  REM EATING ROUTINES
1310  IF N1$="" THEN PRINT :PRINT "TSK, TSK, PLEASE SUPPLY A
      NOUN.":PRINT :RETURN
1320  IF N1$="SANDWICH" AND OB(5)=34 THEN PRINT :PRINT
      "YUM, YUM, THAT TASTED GOOD.":OB(5)=0:RETURN
1330  IF N1$="MCRIB" AND OB(5)=34 THEN PRINT :PRINT
      "YUM, YUM, THAT TASTED GOOD.":OB(5)=0:RETURN
1340  IF N1$="SANDWICH" OR N1$="MCRIB" THEN PRINT
      :PRINT "YOU DON'T HAVE IT.":RETURN
1350  IF N1$="DRUMSTICK" AND OB(4)=34 THEN PRINT :PRINT
```
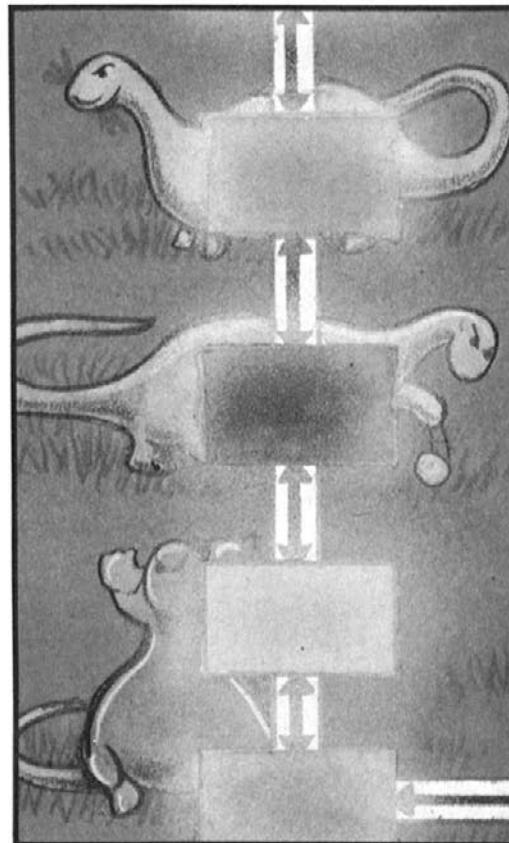
```
        "YUCK, THAT TASTED AWFUL.":OB(4)=0:RETURN
1360 IF N1$="DRUMSTICK" THEN PRINT :PRINT "HOW CAN
     YOU, YOU DON'T HAVE IT.":RETURN
1370 PRINT :PRINT "DON'T BE SILLY. YOU CAN'T EAT
     THAT!":RETURN
1400 REM GIVING OR FEEDING ROUTINE
1410 GOSUB 2200
1420 IF OB(X)=34 THEN GOTO 1440
1430 PRINT :PRINT "YOU CAN'T ";V1$;" SOMETHING YOU"
     :PRINT "DON'T HAVE!":GOTO 100
1440 IF R=28 THEN OB(X)=0:GOTO 3580:REM THE DRAGON'S
     GONNA EAT IT
1450 PRINT :PRINT "I DON'T KNOW HOW TO TELL YOU THIS,
     BUT NO ONE WANTS IT.":GOTO 100
1500 REM ROOM DESCRIPTION SUBROUTINE
1510 DES$="YOU ARE IN A FOREST":PRINT DES$:IF RD(R)=1
     THEN RETURN
1520 PRINT :PRINT "IT IS A WARM SPRING DAY IN THE FOREST
     PRIMEVAL. YOU ARE DRESSED IN A JERKIN. CUTE LITTLE";
1522 PRINT " FURRY CREATURES BOUND THROUGH THE
     WOODS.":RD(R)=1:RETURN
1530 DES$="YOU ARE IN A LEAFY FOREST":PRINT DES$:IF
     RD(R)=1 THEN RETURN
1535 PRINT :PRINT "THE LEAVES IN THE TREES ARE QUITE
     UNUSUAL SINCE THIS IS SPRING.":PRINT
1540 PRINT "THESE ARE LEAF SPRINGS.":RD(R)=1:RETURN
1550 DES$="YOU ARE IN A LEAFY GLADE":PRINT DES$:IF
     RD(R)=1 THEN RETURN
1560 PRINT :PRINT "AREN'T YOU GLAD YOU'RE IN THE
     GLADE?":RD(R)=1:RETURN
1570 DES$="YOU ARE IN THE PINE FOREST":PRINT DES$:IF
     RD(R)=1 THEN RETURN
1575 PRINT :PRINT "THE WIND BLOWING THROUGH THE PINES
     IS SINGING A SONG. YOU LISTEN CLOSELY AND CAN
     MAKE OUT ";
1577 PRINT "SOME OF THE WORDS.":PRINT :PRINT "THEY ARE,
     'I OPINE A DRAGON TO SWEETEN MAKE SURE THAT HE'S
     EATEN'."
1580 RD(R)=1:RETURN
1590 DES$="ALL THE TREES ARE DEAD HERE":PRINT DES$:IF
     RD(R)=1 THEN RETURN
1600 RD(R)=1:RETURN :REM PUT YOUR OWN CLEVER
     MESSAGE ON THIS LINE
1610 DES$="YOU ARE ON A PAVED ROAD":PRINT DES$:IF
     RD(R)=1 THEN RETURN
1615 PRINT :PRINT "TO THE SOUTH IS THE NORTH SIDE OF A
     DRAWBRIDGE. THE BRIDGE LOOKS PRETTY RICKETY."
1620 RD(R)=1:RETURN
1630 DES$="YOU ARE IN THE THRONE ROOM":PRINT
     DES$:GOSUB 3100
1640 RETURN
1650 DES$="YOU ARE IN THE ANTECHAMBER":PRINT DES$:IF
     RD(R)=1 THEN RETURN
1660 PRINT :PRINT "THIS, AS YOU'LL FIND, IS NOT A VERY
     LARGE CASTLE. IN FACT IT HAS ONLY THREE (I THINK) ";
1665 PRINT "ROOMS.":RD(R)=1:RETURN
1670 DES$="THIS IS THE KING'S BEDROOM":PRINT DES$:IF
     OB(3)=34 THEN PRINT :PRINT "THE ROOM IS EMPTY."
     :RETURN
1680 PRINT :PRINT "THE POOR KING HAS BEEN EXPOSED TO
     WEREWOLF SIMPLEX II AND IS SLOWLY TURNING INTO ";
1685 PRINT "A WOLF.":PRINT :PRINT "HE EXPLAINS THAT
     UNLESS CURED BY THE MAGIC SPRING HE IS DOOMED
     SINCE HE CAN'T "
1687 PRINT "LEAVE THE PALACE.":RD(R)=1:RETURN
1690 DES$="MORE FOREST":PRINT DES$:IF RD(R)=1 THEN
     RETURN
1700 PRINT :PRINT "JUST MORE AND MORE FOREST"
     :RD(R)=1:RETURN
```

```
1710 DES$="NORTH END OF BRIDGE":PRINT DES$:GOSUB 3000
1720 RETURN
1730 DES$="CAUSEWAY TO CASTLE":PRINT DES$:IF RD(R)=1
     THEN RETURN
1740 PRINT :PRINT "TO THE NORTH YOU SEE A SMALL CASTLE.
     SMALL DOES NOT DO IT JUSTICE. IT IS REALLY SMALL. ";
1745 PRINT "IF YOU WANT TO SEE ":PRINT "HOW SMALL, GO
     NORTH.":RD(R)=1:RETURN
1750 DES$="AND YET EVEN MORE FOREST":PRINT DES$:IF
     RD(R)=1 THEN RETURN
1760 PRINT :PRINT "IF YOU THINK IT'S DULL READING ABOUT
     THE FOREST, YOU SHOULD TRY YOUR HAND AT
     WRITING ABOUT ";
1765 PRINT "IT.":RD(R)=1:RETURN
1770 DES$="DARK FOREST":PRINT DES$:IF RD(R)=1 THEN
     RETURN
1780 PRINT :PRINT "THERE IS SOMETHING VERY STRANGE
     HERE. THE GROUND SOUNDS HOLLOW!"
     :RD(R)=1:RETURN
1790 DES$="SOUTH SIDE OF DRAWBRIDGE.":PRINT DES$:IF
     RD(R)=1 THEN RETURN
1800 GOSUB 3070:RETURN
1810 DES$="GENTLY ROLLING HILLS":PRINT DES$:IF RD(R)=1
     THEN RETURN
1820 PRINT :PRINT "THE HILLS ARE ALIVE WITH THE SOUND OF
     MUSIC. THEY SING:":PRINT :PRINT "DON'T PUT YOUR
     SHOULDER"
1825 PRINT "TO THE BOULDER,":PRINT "BUT TEST YOUR
     METTLE,":PRINT "AGAINST THE KETTLE.":RD(R)=
     1:RETURN
1830 DES$="VOLCANIC HIGHLANDS":PRINT DES$:IF
     RD(R)=1 THEN RETURN
1840 PRINT :PRINT "ALL ADVENTURE GAMES HAVE TO HAVE
     AT LEAST ONE VOLCANO. THIS VOLCANO IS ALL POOPED
     OUT AND ";
1845 PRINT "WILL NOT ERUPT DURING THIS GAME."
     :RD(R)=1:RETURN
1850 DES$="VOLCANO VALLEY":PRINT DES$:IF N(18)=14 THEN
     RETURN :REM IF N(19)=14 THE SECRET PASSAGE IS OPEN
1860 GOSUB 3210:RETURN
1870 DES$="MARSHY SWAMP":PRINT DES$:IF RD(R)=1 THEN
     RETURN
1880 PRINT :PRINT "A SMALL DINOSAUR STICKS ITS TONGUE
     OUT AT YOU FROM BEHIND A FERN. IT THEN DARTS
     AWAY."
1885 RD(R)=1:RETURN
1890 DES$="MORE MARSHY SWAMP":PRINT DES$:IF RD(R)=1
     THEN RETURN
1900 PRINT :PRINT "THE SMALL DINOSAUR REAPPEARS AND
     HURLS A ROCK AT YOU. THE ROCK MISSES AND THE
     DINOSAUR DARTS ";
1905 PRINT "AWAY.":RD(R)=1:RETURN
1910 DES$="MUSHY SWAMP":PRINT DES$:IF RD(R)=1 THEN
     RETURN
1920 PRINT :PRINT "THE SMALL DINOSAUR TAUNTS YOU BY
     SAYING (IN DINOSAUR LANGUAGE):":PRINT :PRINT
     " 'NYAH, ";
1925 PRINT "NYAH, THE DRAGON'S GONNA ":PRINT "GET
     YOU!' ":RD(R)=1:RETURN
1930 DES$="A PLAIN":PRINT DES$:IF RD(R)=1 THEN RETURN
1940 PRINT :PRINT "OUTSIDE OF A RUSTY SWORD, THERE IS
     NOTHING UNUSUAL HERE.":RD(R)=1:RETURN
1950 DES$="PLAIN PLAIN":PRINT DES$:IF RD(R)=1 THEN
     RETURN
1960 PRINT :PRINT "NOTHING UNUSUAL HERE."
     :RD(R)=1:RETURN
1970 DES$="PLANE PLAIN PLAIN":PRINT DES$:IF RD(R)=1 THEN
     RETURN
1980 PRINT :PRINT "NOT ONLY IS NOTHING UNUSUAL HERE,
```

```
         BUT IT'S VERY FLAT HERE.":RD(R)=1:RETURN
1990  DES$="THE LAND OF THE MAGIC SPRING":PRINT DES$:IF
         RD(R)=1 THEN RETURN
2000  PRINT :PRINT "A GORGEOUS RAINBOW ARCHES ACROSS
         THE SKY AND PINK EGRETS FLAP HAPPILY BY. A SIGN
         PAINTED ";
2005  PRINT "ON THE WALL SAYS:":PRINT " 'SATISFACTION
         GUARANTEED OR YOUR MONEY BACK!' "
         :RD(R)=1:RETURN
2010  DES$="NONDESCRIPT LAND":PRINT DES$:IF RD(R)=1
         THEN RETURN
2020  PRINT :PRINT "I SIMPLY CAN'T DESCRIBE A NONDESCRIPT
         LAND.":RD(R)=1:RETURN
2030  DES$="BREAK LAND":PRINT DES$:IF RD(R)=1 THEN
         RETURN
2040  PRINT :PRINT "LOOKING AROUND YOU SEE PICNIC
         TABLES AND GARBAGE CANS OVERFLOWING WITH
         LITTER. ";
2045  PRINT "HOWEVER, IT APPEARS THAT YOU FRIGHTENED
         SOMEONE OR SOMETHING AWAY AS THEY LEFT THEIR
         LUNCH ON THE ";
2047  PRINT "TABLE.":RD(R)=1:RETURN
2050  DES$="LAIR OF THE DRAGON":PRINT DES$:GOTO 3500
         :REM OFF TO THE DRAGON ROUTINES
2060  REM DON'T NEED SECONDARY DESCRIPTIONS HERE
2070  DES$="TWISTY LITTLE MAZES":PRINT DES$:IF RD(R)=1
         THEN RETURN
2080  PRINT :PRINT "JUST KIDDING. NO MAZES IN THIS GAME.
         IF YOU WANT TO SEE MY FEELING ON MAZES SEE THE
         LAST ";
2085  PRINT "ISSUE OF 'SOFTLINE'.":RD(R)=1:RETURN
2090  DES$="ENTRANCE TO MAGIC LAND":PRINT DES$:IF
         RD(R)=1 THEN RETURN
2100  PRINT :PRINT "MAGIC LAND IS TOO GORGEOUS FOR
         WORDS.":RD(R)=1:RETURN
2110  DES$="COLONEL'S CAVERN":PRINT DES$:IF RD(R)=1
         THEN RETURN
2120  PRINT :PRINT "THIS APPEARS TO HAVE BEEN SOME SORT
         OF QUICK FOOD PLACE AT ONE TIME. THERE IS THE
         SMELL OF ";
2125  PRINT "GREASE IN THE AIR.":RD(R)=1:RETURN
2130  DES$="VERY SECRET CAVE":PRINT DES$:IF RD(R)=1
         THEN RETURN
2140  PRINT :PRINT "SOMEONE HAS SPRAY PAINTED THIS CAVE
         AND SCRAWLED GRAFFITI ALL OVER THE WALL. I
         WON'T ";
2145  PRINT "GIVE ANY MORE DETAILS ":PRINT "AS I'M NOT
         THAT SORT OF COMPUTER.":RD(R)=1:RETURN
2150  DES$="BOOM BOOM ROOM":PRINT DES$:IF RD(R)=1
         THEN RETURN
2160  PRINT :PRINT "ISN'T THAT RICH?":RD(R)=1:RETURN
2200  REM SUBROUTINE TO CHECK NOUNS
2210  IF N1$="STICK" THEN X=1
2220  IF N1$="SWORD" THEN X=2
2230  IF N1$="SPRING" THEN X=3
2240  IF N1$="DRUMSTICK" THEN X=4
2250  IF N1$="MCRIB" OR N1$="SANDWICH" THEN X=5
2260  IF N1$="DRUM" THEN X=6
2270  IF N1$="WAGON" THEN X=7
2280  RETURN
2300  REM SUBROUTINE TO CHECK NOUNS
2310  IF X=OB(1) THEN PRINT "A STICK":Y=1
2320  IF X=OB(2) THEN PRINT "A SWORD":Y=1
2330  IF X=OB(3) THEN PRINT "A MAGIC SPRING":Y=1
2340  IF X=OB(4) THEN PRINT "A DRUMSTICK":Y=1
2350  IF X=OB(5) THEN PRINT "A MCRIB SANDWICH":Y=1
2360  IF X=OB(6) THEN PRINT "A TOY DRUM":Y=1
2370  IF X=OB(7) THEN PRINT "A DRAGON WAGON":Y=1
2380  IF Y=0 THEN PRINT "NOTHING"
2390  PRINT
2400  Y=0
2410  RETURN
2500  REM THESE ARE THE ROOM DATA STATEMENTS
2510  DATA 0,6,2,0
2520  DATA 0,0,3,1
2530  DATA 0,0,4,2
2540  DATA 0,0,5,3
2550  DATA 0,10,0,4
2560  DATA 1,11,0,0
2570  DATA 0,0,8,0
2580  DATA 0,12,9,7
2590  DATA 0,0,0,8
2600  DATA 5,14,0,0
2610  DATA 6,0,12,0
2620  DATA 8,0,13,11
2630  DATA 0,0,14,12
2640  DATA 10,0,0,13
2650  DATA 0,19,16,0
2660  DATA 0,0,17,15
2670  DATA 0,0,18,16
2680  DATA 0,0,0,17
2690  DATA 15,20,0,0
2700  DATA 19,21,0,0
2710  DATA 20,22,0,0
2720  DATA 21,26,23,0
2730  DATA 0,27,24,22
2740  DATA 0,29,0,23
2750  DATA 0,30,0,0
2760  DATA 22,31,27,0
2770  DATA 23,0,28,26
2780  DATA 0,0,0,0
2790  DATA 24,0,30,28
2800  DATA 25,33,0,29
2810  DATA 26,0,0,0
2820  DATA 28,29,0,0
2830  DATA 30,0,0,0
3000  REM DRAWBRIDGE ROUTINES
3010  IF S(11)=15 THEN PRINT :PRINT "THE BRIDGE IS
         DOWN.":GOTO 3030
3020  PRINT :PRINT "THE BRIDGE IS UP BUT THERE IS A LARGE
         BUTTON JUST OUT OF YOUR REACH."
3030  PRINT :PRINT "A SIGN UNDER THE BUTTON SAYS: 'UNDER
         NO CIRCUMSTANCES PUSH THIS BUTTON!' ":RETURN
3040  PRINT :PRINT "WHOEVER HEARD OF PRESSING A BUTTON
         WITH A ";N1$;"?":PRINT :GOTO 100
3050  PRINT :PRINT "YOU LEAP HIGH IN THE AIR AND PRESS
         THE BUTTON WITH YOUR HAND. THE POISONED LIZARD
         LIVING ";
3055  PRINT "IN THE BUTTONHOLE ":PRINT "PRESSES YOUR
         HAND WITH ITS FANGS AND...":GOTO 3700
3060  PRINT :PRINT "I'LL PRESS THE BUTTON WITH YOUR
         STICK SO THE BRIDGE WILL DROP.":PRINT
3065  PRINT "OOPS, I'VE DROPPED THE STICK INTO THE
         RIVER.":OB(1)=0:S(11)=15:GOTO 100
3070  PRINT :PRINT "AS YOU PASS OVER THE DRAWBRIDGE A
         THREE-TOED OGRE RUNS FROM UNDER THE BRIDGE
         CARRYING ";
3075  PRINT "YOUR STICK. HE PRESSES";:PRINT "THE BUTTON,
         CATCHES THE POISONED LIZARD FROM THE
         BUTTONHOLE ";
3080  PRINT "AND EATS IT.":PRINT :PRINT "THE BRIDGE RAISES
         HIGH UP IN THE AIR, MAKING IT IMPOSSIBLE TO
         RETURN."
3085  RD(R)=1:RETURN
3100  REM THRONE ROOM ROUTINES
3110  IF OB(7)=34 AND OB(3)=34 THEN GOTO 3130
```

```
3120  PRINT :PRINT "THE THRONE ROOM IS EMPTY AND FAIRLY
      CLEAN EXCEPT FOR A DUSTY TAPESTRY
      ON THE WALL. ";
3125  PRINT "THE TAPESTRY DEPICTS A":PRINT "DRAGON IN A
      CAVE EATING A MCRIB SANDWICH.":RETURN
3130  PRINT :PRINT "THE KING JUMPS UP AND DOWN ON THE
      MAGIC SPRING WHICH ACTIVATES ITS CURATIVE
      POWERS. ";
3140  PRINT "HE IS CURED. ":PRINT :PRINT "TO SHOW HIS
      GRATITUDE HE GIVES YOU THE DUSTY TAPESTRY, A DEED
      TO THE ";
3145  PRINT " DRAGON'S CAVE, AND THE TAX BILL THAT THE
      DRAGON NEVER GOT AROUND TO PAYING ON THAT
      PARTICULAR ";
3147  PRINT "PIECE OF PROPERTY."
3150  PRINT :PRINT "HE ALSO GIVES YOU A COMMISSION FOR
      A MUCH MORE LUCRATIVE QUEST, BUT THAT IS
      ANOTHER ADVENTURE ";
3155  PRINT "FOR ANOTHER TIME.":GOTO 3700
3200  REM VOLCANIC ROCK ROUTINE
3210  PRINT :PRINT "YOU ARE IN A WEIRD VALLEY. BLOCKING
      THE NORTH SIDE OF THE CLIFF IS A HUGE ROCK. THE
      ROCK ";
3215  PRINT "IS CHIPPED AND PRETTY":PRINT "WELL BEATEN UP
      AND DENTED.":PRINT :PRINT "A DENTED WITCH'S KETTLE
      IS ";
3218  PRINT "BOLTED DOWN HERE.":RETURN
3220  PRINT :PRINT "YOU PUSH AGAINST IT WITH ALL YOUR
      MIGHT BUT NOTHING SEEMS TO HAPPEN.":PRINT :GOTO
      100
3230  IF N1$="KETTLE" THEN PRINT :PRINT "YOU ";V1$; " THE
      SWORD AGAINST THE ":PRINT "KETTLE. THE ROCK
      VIBRATES IN ";
3235  PRINT "TUNE ":PRINT "AND ROLLS ASIDE, REVEALING A
      PASSAGE TO THE NORTH.":N(18)=14:S(14)=18:GOTO
      100
3240  PRINT "YOU ";V1$;" THE SWORD AGAINST THE ":PRINT
      N1$;" BUT NOTHING HAPPENS.":GOTO 100
3250  PRINT :PRINT "YOU ";V1$;" IT WITH YOUR HAND.":PRINT
      :PRINT "NOTHING SEEMS TO HAPPEN EXCEPT YOUR
      HAND ";
3255  PRINT "HURTS.":GOTO 100
3300  REM MISCELLANEOUS HITTING AND KILLING ROUTINES
3310  PRINT :PRINT "WHAT, YOU DARE TO ";V1$;" IN THE"
      :PRINT "PRESENCE OF THE KING?":PRINT "THE GUARDS
      SEIZE YOU ";
3315  PRINT "AND DRAG YOU OFF":PRINT "KICKING AND
      SCREAMING TO BE FED TO THE DRAGON.":PRINT :GOTO
      3700
3320  REM BEATING THE DRUM
3330  IF OB(4)=34 AND OB(6)=34 THEN GOTO 3370
3340  IF OB(4) <> 34 AND OB(6) <> 34 THEN PRINT "YOU
      DON'T HAVE THAT.":GOTO 100
3350  IF OB(4)=34 THEN PRINT :PRINT "PERHAPS IF YOU HAD A
      DRUM....":GOTO 100
3360  IF OB(6)=34 THEN PRINT :PRINT "YOU HIT THE DRUM
      WITH YOUR HAND AND PRODUCE A MUFFLED
      THUD.":GOTO 100
3370  IF R=28 THEN GOTO 3620
3380  PRINT :PRINT "KABOOM, KABOOM. HITTING THE DRUM
      WITH THE DRUMSTICK PRODUCES A NICE BEAT. YOU'RE
      NO GENE ";
3385  PRINT "KRUPA (WHO?), BUT YOU'LL";:PRINT "DO IN A
      PINCH.":GOTO 100
3390  REM GETTING THE SPRING
3400  PRINT :PRINT "YOU PUSH AND TUG THE MAGIC METAL
      SPRING INTO THE WAGON AND FIND THAT YOU CAN
      NOW ";
3405  PRINT "TRANSPORT IT. AREN'T YOU CLEVER, YOU
      RASCAL YOU.":GOTO 890
3410  PRINT :PRINT "YOU CAN'T SEEM TO MOVE THE HEAVY
      SPRING.":GOTO 890
3420  OB(3)=R:PRINT :PRINT "OH, OH, WITHOUT HAVING
      THE WAGON THE HEAVY METAL SPRING TUMBLES TO THE
      FLOOR."
3425  GOTO 1070
3500  REM DRAGON ROUTINES
3510  PRINT :PRINT "A HUGE, FIERCE, HUNGRY RED DRAGON
      GETS UP FROM ITS NEST IN THE MIDDLE OF THE
      CAVE.":PRINT
3515  PRINT "IT SNORTS FIRE FROM ITS NOSTRILS, BURPS, DOES
      A BIT OF THE OLD SOFT SHOE, AND SAYS TO YOU:":PRINT
3520  PRINT " 'BOY, I'M GLAD YOU MADE IT. NOT ONLY AM I
      BORED, BUT I'M STARVING.":PRINT "SHALL WE DANCE,
      OR ";
3525  PRINT "SHALL YOU":PRINT "FEED ME FIRST?' ":GOTO 100
3530  PRINT :PRINT "THE DRAGON LOOKS AT YOU IN DISGUST.
      HE GETS UP AND SAYS, ":PRINT " 'THAT'S AWFUL. THIS
      IS ";
3535  PRINT "HOW YOU DO IT.' ":PRINT "HE IS EXTREMELY
      CLUMSY AND SAYS, ":PRINT" 'I JUST CAN'T SEEM TO GET
      THE"
3537    PRINT "TEMPO RIGHT.' ":PRINT :PRINT "HE IS GETTING
      MADDER AND MADDER. HE LOOKS AT YOU, SNARLS,
      AND SAYS, "
3540  PRINT " 'WELL, IF YOU WON'T HELP
      ME.....'CHOMP!!":GOTO 3700
3550  PRINT :PRINT "YOU WHIP OUT YOUR TRUSTY SWORD
      AND LUNGE.":PRINT :PRINT "THE DRAGON LOOKS AT
      YOU AND SAYS: "
3555  PRINT " 'HOW THOUGHTFUL, HE BROUGHT HIS OWN
      TOOTHPICK.' ":PRINT :PRINT ".......CHOMP!!!!":GOTO
      3700
3560  PRINT :PRINT "YOU ATTACK THE DRAGON FURIOUSLY
      WITH YOUR BARE HANDS. THE DRAGON CHUCKLES AT
      YOU...":PRINT
3565  PRINT " 'IF YOU HAD A MAGIC SWORD YOU MIGHT
      HAVE HAD A CHANCE.' ":PRINT :PRINT
      ".......CHOMP!!!!":GOTO 3700
3570  PRINT :PRINT "THE DRAGON NOTICES YOU
      REENTER.":PRINT :PRINT " 'MY, THAT WAS A NICE
      DANCE. NOW, I'M HUNGRY!' "
3575  PRINT :PRINT ".......CHOMP!!!!":GOTO 3700
3580  PRINT :PRINT "THE DRAGON GOBBLES UP THE "
      ;N1$;".":PRINT :PRINT " 'YUMMY, GOOD! WHAT (OR
      WHO) IS NEXT?' ":GOTO 100
3590  X=0:R=28:PRINT :PRINT "YOU'RE TRAPPED IN THE
      DRAGON'S CAVE. IF YOU DON'T DO SOMETHING SOON
      YOU'RE IN BIG ";
3595  PRINT "TROUBLE.":TC=TC+1:PRINT :PRINT "YOU'VE
      ONLY GOT ";5-TC;" MINUTES LEFT."
3600  IF TC<5 THEN GOTO 100
3610  PRINT :PRINT "OH, NO...THE DRAGON'S GETTING
      UP.":PRINT :PRINT "HE'S COMING TOWARD
      YOU.":PRINT :PRINT "HE'S ";
3615  PRINT "GOING TO ....CHOMP!!!!":GOTO 3700
3620  PRINT :PRINT "WOW!!! THE DRAGON IS
      FASCINATED.":PRINT "HE GETS UP, TAKES THE DRUM
      AND DRUMSTICK, ";
3625  PRINT "SNIFFS IT, AND BEGINS TO DANCE ":PRINT "AND
      BEAT THE DRUM IN 3/4 TIME."
3630  PRINT :PRINT "WHILE HE'S SO OCCUPIED, YOU NOTICE
      HE HAS MOVED AWAY FROM A PASSAGE TO THE
      SOUTH.":S(28)=32
3635  GOTO 100
3700  PRINT :PRINT "AUF WIEDERSEHEN":END
```

New Players:

FREE FALL

Free Fall looks at it this way:

You walk into your local computer store and go over to the games wall. What do you see? In arcade territory, you have "shoot this," "bomb that," "quick reflexes," and "fast action." With these games, you grit your teeth, hold your breath, and bear down with every bit of concentration as you rack up the points before you're killed. The difference between them is usually where you shoot from or what kind of monsters chase you through the maze.

Over in the fantasy and adventure area there's a plethora of mind-boggling games that pit you against the computer and give you time to think. Lots of time. These games allow you to sit for hours, sometimes days, while contemplating your next move.

Which to choose? It's sort of like offering either a block of ice or a vat of boiling water to a thirsty man; there must be a middle ground.

For computer gamers, Free Fall Associates intends to offer that middle ground between quick-reflex arcade games and engrossing role-playing fantasy games. In addition to a blend of both, the company also offers a precious commodity in the microcomputer games world: originality.

Free Fall, nestled in the town of Morgan Hill, California, is a design and development firm that's dedicated to producing new games and producing them well. Their primary market is Atari 400 and 800 owners, although future plans are to expand to cover the personal computer market in general.

Free Fall is still in its formative stages (founded in December 1981, they have just released their first game), and their bill of fare will be much different from that on the computer store wall. Their first release, *Tax Dodge*, though in the familiar arcade style, is a "thinking man's arcade game," having a monetary theme, objectives, alternatives, and strategies that set it apart from all the other home computer games that share family ties with a certain gluttonous arcade eat-'em-up.

A Thorough Grounding. Jon Freeman graduated magna cum laude from Indiana University with the bachelor's degree in English and received the master's degree in English from the University of California. Having written several science fiction novels, he then decided to write a book on board games. To the best of his knowl-

edge, "No one had ever done a book on modern games. Sure, there were a few on chess and other strategy games, but nothing on the games like *Monopoly, Clue,* or any of the basic war games."

From the book's success, Freeman later churned out articles for *Games* and *Byte* magazines, wrote *The Playboy Winner's Guide to Board Games, The Complete Book of Wargames,* and an article for *Orion's Sword,* the third volume of *The Future at War,* an introduction to science fiction gaming for the novice. If ever a man prepared himself for a career designing games, it was Jon Freeman.

Freeman's most recent stint as a game designer was at Automated Simulations, a company where his name is most frequently associated with *Crush, Crumble, and Chomp* and the entire *Dunjonquest* series, including such bestsellers as *Temple of Apshai* and *Rescue at Rigel.* He cofounded Automated Simulations with Jim Connelley, whom he met through *Dungeons and Dragons* sessions. Connelley mentioned to Freeman that he had a Commodore Pet and suggested that they collaborate in developing a space-war game, which resulted in *Starfleet Orion.*

With Automated off and rolling, Freeman, Connelley, and company headed up the road to San Francisco for the 1980 West Coast Computer Faire. It was there that Freeman met Anne Westfall, who was then with Morton Technologies, busy establishing Disco-Tech, that company's microcomputer products and development division. Ignoring the partition that separated their booths, the two got to talking, and five months later Freeman had convinced Westfall to come and join the gang at Automated.

Westfall's time with Automated—slightly over a year—turned out to be somewhat disappointing at best. She had been designing and developing civil engineering programs on the TRS-80 for surveyors at Morton when she was persuaded to move to Automated. But what she was supposed to do at Automated and what she wound up doing were two different things.

Originally named as an applications team manager, she ended up in maintenance programming, where her main duty was to finish projects that had already been started and to convert existing programs from one machine to run on others. Not quite a test of mettle for someone of her background.

By this time, Freeman felt he had begun to outgrow the confines of Automated. "In the beginning, we were doing state-of-the-art types of things—combining adventures with real-time decision making," Freeman recalls, "and after a while we were still doing the same things. Programs were written in Basic while everyone else was doing theirs in machine language."

Relations with Jim Connelley became increasingly strained over the questions of what direction the company should take and how marketing should be handled. As Freeman recalls, "It was getting away from the fun stuff."

The Automated Simulations founding team finally split in litigation, and many of the original staffers went on to other things. Freeman and Westfall decided to get back to the fun stuff.

Art over Commerce. "We are strictly design and development," says Anne Westfall. "We didn't want to struggle with the headaches that come with trying to advertise, manufacture, and market a product. This way, we can concentrate everything on the actual creation of the product."

Perhaps the hardest part of being strictly a design and development firm is convincing publishers and end users that there is such a thing as game designing, especially when many of the more popular home computer games are routinely patterned after those found in video game arcades.

"It's more than just running down to the arcade, seeing what's a money puller, and then coming out with a home computer version," Freeman explains. "It's more than combining several games and changing them just enough to avoid being taken to court. What we're doing is inventing original games, and part of that includes educating the public that there is a virtue in being original, rather than in being the producer of the sixty-fifth copy of a game."

"Our games are going to offer more," Westfall concurs. "They'll have more substance. And, most of all, there will be a definite point to them, even the fast-action arcade games."

Tax Dodge, marketed through Island Graphics, is testimony to their dedication to originality and to producing games with an objective. In it, players try to pick up as much money as they can during the year while avoiding IRS men who try to take it away. The maze scrolls by so you never know when they're coming. Obstacles in the maze include inflation and red tape, both of which can slow you down, figuratively and literally. At the same time, you also have deductions, tax havens, lawyers, and accountants to help you out.

This is what Free Fall means when they say "originality." In *Tax Dodge*, no one kills or gets killed; the game continues as long as you continue to earn money.

They Will Sell No Game Before Its Time. The apparent guiding philosophy behind Free Fall is a dedication to high quality as well as to originality. Though many businesses—in the computer industry particularly—also boast such a fundamental company rule, some lose that ideal when it comes to making out the paychecks and paying the bills.

Westfall says that, at Free Fall, they don't set impossible deadlines for themselves or try to achieve a quota of games by a certain time. If a game just doesn't feel right, they'll rework it until it does. "We want ours to be different. No clones here."

Game producers have covered the two nether ends of the public broadcast band that measures the range of computer games—low-frequency shoot-'em, beat-'em, and eat-'em-ups, and the exotic high-frequency cerebrations of elegant, endless adventures. Free Fall figures it has the midrange all to itself. **SL**

PAST AND
FUTURE FANTASY

Computers have hit gaming like sound hit the silent movies.

We've seen a lot of games carefully translated from their boards to the new medium, like filmed plays; made to look as much as possible like their old selves, perhaps with a few accommodations to allow for the pressing of keys instead of the movement of playing pieces. We've seen others created expressly for the computer, festooned with graphic gewgaws, dials and gauges, and directions that take longer to read than the game does to play . . . the equivalent of the early talkies that featured long scenes of people eating really crunchy fried chicken and celery stalks just so you could marvel at hearing every sound.

Surviving both conservative resistance and meaningless novelty, the true art of film shortly reasserted itself. The new technology enabled it to reach new heights of expression, and it retained the power to charm, to move, and to hold the attention and the belief of an audience.

Such is proving to be the case with games on the microcomputer.

Bored with Boards. The microcomputer has proven a thousand times over that it is the most revolutionary, uniquely flexible, and adaptable game-playing aid ever conceived. By simply (well, maybe the programmers don't exactly consider it simple) changing its instructions, it can provide an infinite variety of game boards for anything from chess to war games; random move and event generators simulating any-sided dice, cards, spinners, whatever; and playing pieces or miniatures. It can even take on the roles of referee, dungeon master, or opponents as needed.

It is hardly surprising, therefore, that an incredible variety of games run on computers. In some cases, the computer has been used to simulate or duplicate other, less sophisticated play aids, such as pinball machines or pool tables. Other games are actually improved, not just duplicated, when they are put on the computer. The computer can keep track of rules, of play variables, and of data about the game, freeing the player to concentrate on tactics, strategy, and actual playing skills.

The best examples are war games, in which, in board form, much of the playing time is spent moving markers, rolling dice, and checking weather conditions, terrain problems, and battle outcomes for dozens of small forces. The amount of time spent in tactical and strategic thinking is miniscule compared to all the bookkeeping chores. The computer can certainly improve such a game.

The computer can go farther than just improving games, however. With detailed animated graphics, a whole spectrum of games that are impossible without the computer came into existence. Can you imagine trying to play *Alien Rain, Choplifter, Sneakers,* or *Threshold* on a paper or cardboard game board with plastic play pieces? Somehow, something is lost. Games that depend on or are enhanced by animated graphics will always be superior in a computer form.

The computer can potentially improve games in many ways, but the most important are:

1. providing opponents or partners so a single player can play a complex game that would normally require two or more players
2. acting as a referee/game master/bookkeeper by generating random events, keeping track of complex scoring, and ensuring that illegal moves cannot be made
3. providing sophisticated graphics displays for enhanced visual appeal
4. providing animated graphic sequences that require real-time reactions from the player
5. varying the play conditions depending on the skill or experience of the player
6. automatically providing random elements that keep the game

fresh, no matter how often it is played.

Many other factors, of course, determine how good a game is. These are just some of the major factors that make a game better on the computer. If you look at the trends in games over the last few years, you can easily see the evolution of more sophisticated game types by their inclusion of the features listed. Arcade games are the most obvious example, with computer-controlled opponents, randomly varying play, and fast action graphics at varying skill levels. Arcade games incorporate all of the computer-unique game enhancements by their very nature.

In Days of Old. Other game types are less strictly dependent on these features, but some have been evolving toward their use. The earliest adventure and fantasy role-playing games, for instance, were text only, nonrandom (or random in only a few features), single-skill-level games.

Scott Adams's popular adventure series and the classic *Colossal*

BY ROBERT CLARDY

Cave adventure from several publishers are examples of this type of game. These games are referred to as linear adventures because they have a single path through them that must be followed. Puzzles must be solved in a specific order, and, the next time you play, the layout, location of objects, and nature of the puzzles will be identical.

A single unchanging game layout is a handy feature if you are struggling for days to find your way through it, but eventually you do solve it. There is then no reason ever to play the game again. You know its twists and turns, puzzles and surprises, and there will be nothing new in it for you.

Further, the skill level requirement of these adventures was fixed. The game may be extremely difficult for a beginning adventurer but quite easy for an experienced campaigner. This is a problem that has plagued adventure games from the earliest examples up through the more sophisticated games being released today, such as *Zork* or *The Wizard and the Princess*. There are solutions to the problem, however, as we shall see later.

In late 1978, a variation on this theme began appearing. *Beneath Apple Manor, Escape,* and *Dungeon Campaign* were released. Each of these games provided a graphic display of events, automatically mapped your progress, and, most important, provided a totally random dungeon or maze every time you played. *Dungeon Campaign,* for instance, had a maze of 484 locations including rooms, tunnels, pits, and stairways and a wide variety of randomly placed monsters, treasures, and hazards. As such, it was more complex than many linear adventures and yet it could be played in an hour or two, instead of days.

The reasons are simple. First, there were no puzzles that had to be solved to get past a specific location. This would be a weakness as far as seasoned adventurers are concerned but a plus for novices. Second, you could move quickly through the maze. The graphic display told you at a glance where you were, where you could go, and what was near you—such as monsters or poison gas. All the commands available were listed for you by the program so you didn't have to read the programmer's mind to be able to move. With no need to spend time reading repetitive descriptions and trying to guess how to phrase a command, game play was speeded up.

Bookkeeper Wanted. In 1979, *Wilderness Campaign* added a

few more computer-unique enhancements. The first adventure game with a high-resolution display, it maintained the random nature of *Dungeon Campaign* as far as locations of treasures, monsters, and hazards. It also provided sophisticated bookkeeping features relating to purchase of equipment (what was available, how much you could afford, and how much you could carry), maintenance of a force of warriors (Are they paid and fed? Do they have proper equipment?), and the outcome of battles (number and experience of participants, weapon classes, armor classes, and so on).

The popularity of these games has been adequately demonstrated since that time. *Odyssey: The Compleat Apventure, Ultima, Hellfire Warrior,* and *Wizardry* have all been enhanced by good use of the computer for graphics, extensive random events, and handling complex bookkeeping tasks.

Adventures have taken a slightly different progression. In 1980, *Mystery House* added high-resolution graphics to the adventure genre. The graphics have improved continually with the additions of color (*Wizard and the Princess*), very detailed, artistic pictures (*Transylvania* and *Sherwood Forest*), animated sequences within a scene (*Creature Venture*), and animated sequences and scene shifts (*Mask of the Sun*). Scott Adams's original adventures were successfully rereleased with color graphics in his *S.A.G.A.* series.

The linear nature of most adventures improved with the advent of network adventures in which many routes are possible. You retain the puzzles, but the sequence of events and rooms you go

GAME TYPE	BETTER WITH COMPUTER		EQUAL WITH OR WITHOUT COMPUTER	BETTER WITHOUT COMPUTER	
	MUCH	SOMEWHAT		MUCH	SOMEWHAT
Sports (football, baseball, bowling)				✓	
Games of chance (cards, dice, roulette)			✓		
Intellectual board (chess, go, Othello)		1			
Sports simulation (football board games)			✓		
Skill games (pool, darts, archery)					✓
Chance/Skill (Monopoly, dominoes)		2	✓		
War games		2,3,6			
Fantasy role playing		2,3,6			
Adventure					
Arcade	3,5				
Simulation	3,5				
Action or hybrid	1,2,3 4,5,6				

Table 1.
Game types.

through is left up to you. *Time Zone* and the new *Mask of the Sun* illustrate this.

Another major enhancement of adventure games appeared with the *Zork* phenomenon. The program's command interpreter was improved almost to a human capability. The computer as referee/dungeon master is now so good as to be almost invisible. The player is not distracted from the game by the necessity of figuring out the proper syntax and vocabulary for each situation. He can concentrate on the real puzzles instead of the time wasters of trying to determine if you "Get rock," "Pick up rock," or "Move rock." In real life, the stupid rock would be gone in two seconds. If the game takes several minutes of experimentation to do the same thing, its realism and believability suffer.

Cross Breeding. While we have had impressive developments in arcade games, simulations, war games, adventure games, and fantasy games, the most interesting development has been the evolution of the hybrid games, or action games. These are the games that incorporate features from several of the general game categories—games in which the author has rejected the constraints imposed by the labels *arcade* and *adventure* and lets programming creativity run free. *Castle Wolfenstein* and *Aztec* (arcade/fantasy/adventure), *Apventure to Atlantis* (arcade/fantasy/simulation), and *Sheila* (arcade/fantasy) are some of the earliest examples of this freewheeling style.

Purists may find themselves disappointed with this type of game. If you're an arcade player, you'll undoubtedly find a better arcade game in a package that uses the full 48K for arcade features rather than the hybrid, where the arcade code must share space with adventure code. For the more flexible gamer, however, the hybrids can provide a new type of game that requires logic and problem solving as well as reflexes and coordination.

Perhaps more than any other game type, the action games provide unlimited room for innovation and creativity in the use of the computer to enhance a game. Table 1 provides a partial list of game types, indicating which ones are better on or off the computer. The ones that are improved on the computer have numbers corresponding to the six computer improvements listed previously. Only the action games or hybrids have the potential to use fully all the features that the computer can provide to improve a game. The most interesting game developments that will occur in the next few years will be those that best take advantage of this freedom and avoid the slavish adherence to artificial categories and the imitation of past successes.

The classic values of gaming and the advantages microcomputer technology can bring to them are now fully combining, where they previously were separate or even made to work at cross purposes.

Not all the great films were made before 1929; likewise, the greatest games have not all been written. ⬛

GAME'S ANATOMY

Synergistic's latest offering is an example of the steps that games are taking toward the future—at least, as Robert Clardy envisions it.

"The game I've been working on most recently is the product of a conscious and planned attempt to use all the advantages that the computer can provide," says Clardy. The game is *Microbe: The Anatomical Adventure*—originally an adventure or role-playing game in which a party of scientists is miniaturized to microscopic size and injected into a human patient to treat a brain injury.

"While the idea of a medically accurate, informative adventure in such a familiar but utterly alien environment had a lot of appeal by itself," Clardy says, "the game quickly became much more than that. All of the features I included in *Microbe* make it a hybrid that is as rich and as varied as possible."

How so?

"One of the play options in *Microbe* is the number of players. If three or more people are playing, they must keep track of myriad details about their submarine (damaged systems, circuit breakers, and so on), their patient (pulse, blood pressure, and proper levels of the body's immune defenses), the potential attackers (What drug do you use against any of dozens of bacteria, fungii, viruses, or parasites?), various medical emergencies (How do you treat shock or cardiac arrest?), and where they are in the body's numerous veins, arteries, and organs.

"In the one-player mode, the computer provides information from an on-board navigator and physician to advise you of these details. A very complex game can thereby be played by one player with the computer's help."

In *Microbe*, the computer plays referee and bookkeeper, keeping track of how much of each drug you have left, whether your medical equipment is operable, how much fuel, air, and battery power you have, and how the patient's condition varies depending on your actions. Another bookkeeping feature is the on-board ship's library, which provides information about the nature, appearance, and treatment of any of the many attackers you may face.

Clardy has also added visual touches to give *Microbe* the feel of an arcade game.

"There are a variety of graphic displays available. The most obvious is your control panel with its constant updates on fuel, air, battery, compass heading, and sonar readings. You can also display de-

tailed maps of the body or any section of it (for instance, the chest) with routes shown and your position indicated." A steering display shows your sub and its immediate vicinity so you can steer around hazards, blast obstacles like clots and tumors, and negotiate the dangerous organs.

But a game that involves people must also deal with hazards that happen to people. What do you do when things go wrong?

"In the event that your on-board physician is unconscious or dead and can't advise you about drugs, or if you're out of the required drug, you can switch to your closed-circuit TV display and shoot your attackers with your laser. The animated sequences in this mode as well as the animation in the organs provide the arcade features that cannot be duplicated by any noncomputerized game or simulation."

Microbe has a variety of play levels including skill (speed and frequency of attacks), background of the player (if you have medical knowledge, the program advises you less), and number of players. By varying these choices, the game play changes drastically. Obviously, if the harder choices are selected, higher scores are possible.

Like a true adventure, *Microbe* never plays the same way twice. Once you've gotten through it, you can still play it again.

"The random feature provided by the program prevents you from ever playing the same game again. There are thousands of possible cases to select from. Your patients may have varied medical backgrounds such as cirrhosis of the liver, emphysema, arteriosclerosis, heart disease, and so on. They may or may not be allergic to one or more drugs.

"There are dozens of emergency situations that can occur, from auto wrecks to household accidents to terrorist activities. These can result in a wide variety of types of damage at different locations in the brain. Finally, in the game itself, you are faced with random attacks, hazards, and obstacles. No two games will ever be the same.

"*Microbe* is an experiment, combining features of simulations, adventures, arcades, and role-playing games into one harmonious whole. We won't know for a while if this particular game will be a successful experiment; but its very existence hopefully will stimulate others to break the bonds of the game-type labels and try new forms. Only time will tell." ⬛

Apple II Graphics
by Ken Williams

A vital element of most every arcade game in existence is the ability to detect a collision between two objects on the screen. For you, seeing when two objects meet is trivial. All you have to do is look at the monitor! But your Apple has no eyes, so it's in the same position as a blind man who uses a cane to discover objects in his path. Actually, that analogy contains more truth than it has a right to.

Imagine what's involved in dealing with two objects on the screen. Theoretically it's possible to keep a list of all the X,Y coordinates used in each shape and check for collision by seeing if there is a coordinate pair that lies in both shapes.

Suppose that one shape is plotted on the points (1,1), (1,2), and (1,3) and the second uses coordinates (1,2), (2,2), and (3,2). In this case there must be a collision, since the point (1,2) is a part of both shapes.

But that method quickly becomes unworkable. In animation you are continually changing the points used in each shape, so you'd have to keep updating all the lists. More important, the task of crosschecking each point gets out of hand since even a trivial figure will contain perhaps ten points. Crosschecking two such figures would call for 100 checks, and checking three would require 1,000! So much for that idea.
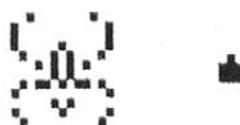
The Blind Man and the Elephant. Let's look now at two more methods, both of which use the blind man's cane approach. We will fire a missile at a shape borrowed from *Crossfire* (by J. Sullivan), and, as the missile moves, we'll continually check its path. So take a few minutes now to enter and save the shape table that follows. From Basic type *call −151* to enter the Monitor, then enter these lines.

300:	02	00	06	00	4A	00	4D	49
308:	49	69	18	DF	DB	DF	DB	07
310:	48	49	69	4D	49	18	DF	DB
318:	DB	DB	07	48	0D	6D	0D	6D
320:	0D	D8	DB	FB	DF	DB	48	09
328:	0D	0D	0D	4D	01	D8	DF	FB
330:	DF	FB	08	4D	49	4D	49	05
338:	18	DF	DB	DB	DB	07	08	4D
340:	49	49	49	05	D8	FB	DB	DB
348:	DF	00	36	27	0D	36	00	00

Now type *3D0G* to get back to Basic, and enter these commands:

```
BSAVE XFSHAPE, A$300,L$50
POKE 232,0:POKE 233,3
HGR:HCOLOR=3:SCALE=1:ROT=0
DRAW 1 AT 20,20
DRAW 2 AT 20,50
```

The first shape, our target, should look a bit like a spider. The second shape is our missile. The shapes should look like this:

If they don't look right, check your work by typing:

```
CALL −151
300.34F
```

When you get the table saved correctly, you are ready to animate. We'll leave the spider alone and move the missile back and forth across the bottom of the screen using the paddles.

When we press the paddle button, the missile moves up the screen until it bumps into the spider or hits the top of the screen. To create that movement, we will repeatedly plot and erase the missile, moving it up one point each time. Before the missile is moved up each time we'll check the space it is moving to to see if the spider is there.

We'll develop the program in two stages, so key in the following to get the basic movement going. You may omit any rem statement except for those in lines 150 and 500.

```
10   D$ = CHR$ (4)
20   PRINT D$"BLOAD XFSHAPE"
30   M0 =  5:M = 5
80   REM
85   POKE 232,0: POKE 233,3
90   HGR : HCOLOR= 3: ROT= 0: SCALE= 1
100  DRAW 1 AT 140,50
110  XDRAW 2 AT M,150
120  REM
130  REM CHECK PADDLE
140  REM BUTTON
150  REM
160  IF PEEK ( − 16287) > 127 THEN GOSUB 500
170  REM
180  REM MOVE MISSILE
190  REM
200  IF PDL (0) < 90 THEN M = M − 2: GOTO 220
210  IF PDL (0) > 150 THEN IF M < 277 THEN M = M + 2
220  IF M < 1 THEN M = 1
230  IF M = M0 GOTO 250
240  XDRAW 2 AT M0,150: XDRAW 2 at M,150: M0= M
250  GOTO 150
480  REM
490  REM COLLISION DETECT
500  REM
510  REM WE'LL PUT THIS IN SHORTLY!
520  PRINT CHR$(7):RETURN
```

This much will get the spider onto the screen and the missile moving and firing under the control of paddle 0. When you press the paddle 0 button, the computer will beep at you.

Whenever the missile moves, M0 holds the old X coordinate of the missile and M holds the new one. The missile is moved by decrementing or incrementing M (lines 200 and 210) and then xdrawing to erase the old missile and xdrawing again to plot the new one (line 240). If you wonder about the function of any line, try deleting it and see what doesn't happen.

Arachnid Annihilation. After you've got the missile moving across the bottom of the screen, we'll talk about the collision routine. Run the program as you have it so far and press control-C to recapture control, leaving the spider on the screen. Imagine that there is a little box drawn around the spider. In fact, put the box there by typing these four lines from Basic:

```
HPLOT 137,38 TO 153,38
HPLOT TO 153,51
HPLOT TO 137,51
HPLOT TO 137,38
```

As we move the missile up the screen, we will check to see if it moves inside that box, and if it does . . . *boom!*

Add these lines to your program:

```
40   REM
50   REM SET BOUNDARIES
60   REM
70   YMAX = 51:MINX = 137:MAXX = 153
510  PRINT CHR$ (7): REM BELL
520  C = 0: REM COLLISION FLAG
530  FOR Y = 149 TO 0 STEP − 1
540  IF Y < YMAX THEN IF M > MINX AND M < MAXX THEN C =
     1: REM COLLISION!!
550  IF C THEN PRINT CHR$ (7); CHR$ (7); CHR$ (7): XDRAW 2
     AT M,Y + 1: GOTO 620
560  XDRAW 2 AT M,Y + 1: XDRAW 2 AT M,Y
570  NEXT Y
580  REM ERASE MISSILE AT TOP
590  Y = Y + 1
600  XDRAW 2 AT M,Y
610  REM DRAW NEXT MISSILE
620  XDRAW 2 AT M,150
630  RETURN
```

Line 70 sets the boundaries for the square. The top boundary is ignored in this example because the missiles always come from below.

Line 540 is the real detection line. It first checks the Y coordinate of the tip of the missile to see if it is high enough to strike the box. If it is, the X position is checked to see if it is in the correct horizontal range. If all of these conditions are true, we have a collision and the flag (C) is set to one for later reference.

Line 550 is where you ordinarily would jump to your nifty explosion routine, but since this is only an example all we do is set off the bells and whistles, erase the missile from the bottom of the box, and then jump to where the new missile is drawn at the bottom—big deal! As before, the reason for obscure statements like the one in line 590 can be found by deleting them and watching for what messes up.

You may think it would be more efficient to check the X coordinate of the missile before checking the Y, thereby determining whether or not there would be a collision before the missile even started to move up the screen. Before you sharpen your pencils to write Directline and tell us that . . . okay, you're right; you win. But that only works when the target is stationary, and you probably won't feel much like rewriting the routine after getting it all checked, typed up, and checked again.

On the other hand, maybe you will. . . .

The box method is fairly simple to use, but since it declares a collision based on some imaginary square instead of actual contact with the target it's also a little on the sloppy side. Furthermore, we only checked for the center of the missile, which may actually miss the spider even when one of the edges hits it. Unfair! If you've ever played a game that has sloppy collision detection (and there are a bunch of them) you know how frustrating it can be.

Checking across the full width of the missile is pretty easy; try it yourself. The problem of detecting an actual contact is more interesting.

Connect the Dots. Our collision detection routine involves taking a peek at hi-res memory to see if you are about to move onto a dot that is already turned on. (In this example, the only dots turned on are in the target.)

Dealing directly with memory is always complex from Basic, and it gets worse in this instance because we want to look at individual bits. To set this process in motion, type in the following changes to the existing program:

```
DEL  40,70
5    GOSUB 1000: REM CALC Y ADDR.
515  Q% = M / 7:R% = M − 7 * Q%:R% = R% + 1
536  V% = PEEK (Y%(Y) + Q%)
538  FOR I = 7 TO R% STEP − 1
540  P% 2 ∧ I
542  IF V% > = P% THEN V% = V% − P%
```

```
544  NEXT I
546  IF V% > = 2 ∧ I THEN C = 1
1000 REM
1010 REM CALCULATE Y
1020 REM COORDINATES
1030 REM
1040 DIM Y%(192)
1050 FOR I = 0 TO 184 STEP 8: READ SA%
1060 FOR J = 0 TO 7:Y%(I + J) = SA% + J * 1024
1070 NEXT J,I
1080 DATA 8192,8320,8448,8576,
     8704,8832,8960,9088
1090 DATA 8232,8360,8488,8616,
     8744,8872,9000,9128
1100 DATA 8272,8400,8528,8656,
     8784,8912,9040,9168
1110 RETURN
```

Line 5 and lines 1000 through 1110 should be familiar from past articles in this series; they set up a table that assigns to each line on the screen (0 through 191) its starting address.

Line 515 divides the X coordinate by seven to determine which of the forty bytes across the screen the missile is in (Q%) and which dot of that byte (R%) it's on. Let's suppose that the missile is fired along X coordinate 45, so that the tip is in byte 6 and dot 3 (counting the first dot in each byte as 0). Then we need to check dot 3 in the byte above the missile before moving the missile up to each new Y coordinate. As long as that dot is off, there's nothing to hit. If that dot is on, we've run into the target and need to set the collision flag.

The process of isolating a particular dot is clumsy in Basic, but lines 538 through 546 do the job. Line 536 sets V% to the value of the byte you need to check. To understand how those lines operate, it would be instructive (though insufferably tedious) to set V% to 60 (which would be 0011 1100 in binary) and run through those lines by hand.

Like the previous routine, this routine only checks the center of the missile, so it's possible to contact the target with the left or right sides and still not detect a collision. Two trivial modifications to the routine will cause it to check across the entire width of the missile, but you can discover them for yourself.

Faster than a Speeding Snail. When you run this version of the program, you'll notice that a collision is detected only when the missile actually contacts the target. You'll also notice that the animation is slower as a result of the increased processing involved in this scheme—you can't have everything.

With a little effort, the Basic code can be streamlined to enhance the execution, but the real gain is made by writing this collision detector in machine code, something we won't cover here.

The contact collision detection is further complicated if you have other objects on the screen, such as clouds, which the missile is required to ignore. There are two common ways of handling that.

In some games, a table is kept of the current position for each target. When any collision is flagged, that table is scanned to see if there is a target close by. If so, the target is destroyed; if not, the collison is ignored. One interesting side effect of this technique is that when two targets are close together the scanning routine will sometimes decide that the wrong one has been shot.

Hi-Res Sleight of Hand. The other method of dealing with extraneous objects is to use both hi-res screens. One is displayed with all the junk on it, while the other has only the missiles and targets on it and isn't displayed. Then the collision detection routine can check the second screen and not even worry about the extra figures! In some applications the extra time needed to process two screens is offset by not having to spend time deciding what was run into.

That about wraps it up. We hope this series has shed some light on ways to make Apple graphics do what you want them to and how a lot of the games achieve their effects. We're interested in your comments on these articles and your suggestions for future ones. Send them to Ken's Graphics, Softline, Box 60, North Hollywood, CA 91603. **SL**

Atari Sound
by Bill Williams

Part 4: A Different Shade of Noise

Let's discuss some terms that crop up in audio synthesis work and see how they relate to the Atari's distortion parameter. These terms are quite handy to have around when describing sounds. You might get strange looks when you suggest "using a little brown noise" to a fellow hacker, but it's more dignified than just making gurgling noises.

Boom—Chicka—Boom. The word *noise* has a derogatory connotation to most people. It conjures up images of jackhammers, trash can lids, or your roommate's taste in music. Purge yourself of this notion! The soothing sounds of wind and surf, the pitter-patter of raindrops on a window, and the rustling of leaves in a summer breeze all fit into the category of noise, as do explosions, cymbals, and hand clapping.

What does *noise* mean, then? Well, if we considered the similarities in the examples just cited, we might conclude that noise means an unpitched sound. After all, none of the sounds we've mentioned so far produces a note that we could whistle. As a definition, this is not far off, but it's misleading.

Let's try an experiment.

The Noise Demo. This installment's a quick-and-dirty examination of the components of noise. What this program reveals may surprise you. It's written in assembler because Basic is too slow to get the point across. Listing 1 is the relocatable assembler code. Listing 2 is a Basic program that will poke the code into memory and execute it. To try this out, you'll need a set of paddles plugged into port 1.

Type in the Basic program and *save it*. A machine language program's greatest joy in life is to eat itself, and a single error will prob-

ably lock up your system. If it does and you've saved a copy, you can just turn the computer off, reload the program, and find your error. If you haven't saved your program, you get to type it in again (and run the risk of making another error).

Once you've saved the program, turn paddle 1 clockwise and run the program. You should hear a series of random notes; the audio control register has been poked with $A8, which is the Basic equivalent of distortion register 10 (pure tone), volume 8. Now turn the paddle counterclockwise, and the rate at which random notes occur will speed up.

So far, so good. But as you approach the CCW limit of the paddle's rotation, something strange happens to the tone. Yes, this is still distortion parameter 10!

Some Generalizations. From this little experiment, we can conclude that noise is not an unpitched sound, but a lot of random frequencies heard in quick succession. Too many notes clamoring for our attention, if you will. Our ears throw up their hands (lobes?) and can no longer distinguish the individual notes; hence our first conclusion that there was no "pitch" to the sound.

What, then, differentiates one noise type from another? The sound of the wind is quite obviously different from the sound of thunder, and yet we've just decided that both are made from the same stuff—random notes.

The answer lies in how those notes are distributed. We call this *bandwidth*. Say, for example, there is an equal probability of low frequencies occurring as of high frequencies. We would say that this noise has a wide bandwidth. If graphed on a frequency continuum, the sound would be scattered across a wide range of pitches. Audio engineers draw an analogy between this frequency spectrum and the light spectrum. This kind of sound is called *white noise*. White noise is what you hear when you turn your Atari off before turning the television set's volume down.

The sounds made by wind and surf are generally called *pink*

```
                ;NOISDEMO.ASM
                ;(Relocatable code)
                ;
                ;Hardware equates
     = 0270     PADDL0      =    $270
     = 027C     PTRIG0      =    $27C
     = D20A     RANDOM      =    $D20A
     = D200     AUDF        =    $D200
     = D201     AUDC        =    $D201
                ;
                ;
0000   68       INIT   PLA                      ;pop the stack
0001   A9A8            LDA    #$A8              ;start pure tone
0003   8D01D2          STA    AUDC
0006   AD0AD2   LOOP   LDA    RANDOM            ;get random freq
0009   8D00D2          STA    AUDF              ;store it
000C   AE7002          LDX    PADDL0            ;get delay value
000F   F0F5^0006       BEQ    LOOP              ;no delay
0011   88       DLAY   DEY                      ;twiddle thumbs
0012   D0FD^0011       BNE    DLAY
0014   CA              DEX
0015   D0FA^0011       BNE    DLAY
0017   AD7C02          LDA    PTRIG0            ;trigger up?
001A   D0EA^0006       BNE    LOOP              ;do it again
001C   8D01D2          STA    AUDC              ;shut up!
001F   60              RTS                      ;back to basics
```

Listing 1.

```
10   REM Basic routine to install
20   REM and execute noise demo
30   DIM DEMO$(1),DEMO(6)
40   FOR LOC=ADR(DEMO$)+1 TO ADR(DEMO$)+32
50   READ BYTE
60   POKE LOC,BYTE
70   NEXT LOC
80   REM Call Demo—
90   REM Press paddle trigger to
100  REM return to Basic
110  Q=USR(ADR(DEMO$)+1)
120  END
2000   DATA 104,169,168,141,1,210,173,10,210,141,0,210,174,112,2
2010   DATA 240,245,136,208,253,202,208,250,173,124,2,208,234,141,1,
         210,96
```

Listing 2.

noises—the top end of their bandwidth is vacant and they only have pitches between the low frequencies and the midrange frequencies. Other terms often used are *red noise*, which refers to deep explosions and the like; and *brown noise*, which is the kind of sound that peels paper off of $200 speaker cones. All of these terms simply describe the frequency content of the noise. The lighter the color, the more high frequencies the noise has.

Is there a black noise? Well, if we follow out the light analogy, black noise would be silence. Try talking about that one and you'll get strange looks from anyone!

Randomness. So far we've looked at just one characteristic of noise—how widely the random frequencies are distributed. Another factor that affects the character of noise is the degree of randomness involved in selecting these frequencies. If this distinction seems trivial to you, consider the following patterns:

[A] 40 2 40 2 40 2
[B] 7 6 6 5 7 5 6

Pattern A has a wide bandwidth—38—and yet we can easily discern the pattern. Pattern B has a very narrow bandwidth—3—and yet there is no obvious pattern. Pattern B is more random.

Subjectively, the more random the noise is, the more "natural" it sounds. Repetitive patterns tend to sound machinelike. The random number generator used in the demo program is pretty random, so the pattern of the sound is not at all obvious to our ears.

To see how this applies to the Atari, we have to rephrase our question a bit. Rather than asking "How random are the frequencies?" let's ask, "How long does it take before the pattern repeats?" Computers, you see, are notoriously nonrandom. The same laws that assure us of the same answer to an identical question (A = 2 + 2) also keep us from getting a truly random number. So, if there's always going to be a pattern, the key question is, "How long is the pattern?" A pattern that takes a year to repeat is going to seem random to most of us humans; pattern A (used earlier) doesn't seem random at all.

Down from the Ivory Tower. We now have two characteristics of noise defined: bandwidth and randomness. Armed with these new distinctions, let's trudge back to the subject of clocks from last issue and see if we can make some sense out of all this.

In an earlier column, we detailed how a pitch is derived from the master clocks; in pure tone mode, these pulses are passed directly to the television set. With the other distortion modes, this derived waveform is passed on to other circuits called *comparators*. These circuits omit random pulses of the waveform and thus distort the waveform so that a single pitch is turned into a series of randomly varying pitches. This is how we get noise.

Remember the divide-by-N circuit? The principle is the same. A number of pulses enter the comparator, and some of them are masked out. With this circuit, however, the pulses that are removed are random and unpredictable; thus the waveform becomes unpredictable, too.

The key thing to be aware of is that the comparators don't add any pulses, they only subtract them. Therefore, the pitch can *never be higher than the originally derived tone*. The lower the original pitch is, the lower the maximum noise frequency will be. Thus, by lowering the frequency (putting greater numbers in AUDF), we restrict the bandwidth of the noise.

This is called a *low-pass* filter, because, no matter what the *corner frequency* is (the original pitch selected by AUDF), the low frequencies will always be allowed to pass through. It is only the frequencies above the corner frequency that are cut off. Thus, as the corner frequency is lowered, we go from white noise to pink noise to red noise and so forth. In this way, the pitch parameter in these modes is similar to the tone control on your stereo.

The distortion parameter, on the other hand, controls the randomness of the comparators. The comparators do what their name implies—they compare the input waveform to another input

waveform and output only the similarities. If this other waveform (call it input B) is random, then the pulses allowed to pass will be random. By controlling the randomness of input B, then, we control the randomness of the output waveform.

How do we change the randomness of the input B waveform? The Atari generates this waveform by using something called a polynomial counter. Basically, a *polynomial counter* is a shift register that derives its first bit from the state of its other bits (the derivation is made by boolean logic gates). This bit is then shoved into the shift register, all the other bits move down to make room for it, and—presto!—a new random number. The next new bit is then derived from *this* number.

The upshot of this is that the more bits there are in the poly counter, the longer it takes for the pattern to repeat. The Atari has three different poly counters, all of different bit lengths—4, 5, and 17. The 17-bit poly takes a long time to repeat, while the 4-bit counter repeats the most. The distortion parameter just shunts different combinations of these poly counters into the comparators, producing different degrees of randomness in the distortion pattern. From our previous discussion, we can predict that the 17-bit poly is going to sound much more natural than the others.

The following chart shows how the poly counters are combined for the different distortion parameters:

AUDC/poly counters used
0 = 5 and 17 bit
2,6 = 5 bit
4 = 5 and 4 bit
8 = 17 bit
10,14 = none
12 = 4 bit

All of the distortion values, by the way (even pure tone), lower the resultant pitch an octave before it reaches your television set.

You should now be able to see why the pitch-note tables only work with distortion parameter 10. The random masking of pulses produced by the other distortion modes makes it very difficult to predict what the subjective note is going to be. All sorts of wild things can happen with waveform cancellation—but that's another column.

Finally, a small sermon. The real object of this column is to make the beeps and squawks you get *predictable*, so that you will spend less time getting that perfect sound for your program. You now have a considerable amount of information under your belt. Use it! When you want a particular sound, find a sample and analyze it. What is its bandwidth; how repetitive is the distortion pattern? Ideally, you should be able to predict the "quality" of a sound before you even sit down at the keyboard. Sound impossible? Practice—you may be surprised!

Editorial Erratum. The people cried "Space! Space!" But there was no space. So we crunched the last twelve lines of November's sample program 2 into two lines, the realization of our tragic error coming too late. To get those well-tempered high-frequency notes printing like they ought to, replace the last two lines with these:

```
500  DATA C
501  DATA C#/Db
502  DATA D
503  DATA D#/Eb
504  DATA E
505  DATA F
506  DATA F#/Gb
507  DATA G
508  DATA G#/Ab
509  DATA A
510  DATA A#/Bb
511  DATA B
```

A boy and his toys. Mike Livesay tickles the ivories when he isn't poking routines.

Digging for Gold:
MIKE LIVESAY
Stakes His Claim

by MATTHEW YUEN

If you recognize the name of Michael Livesay, you probably recognized the name Steve Martin back in the early seventies when he was a writer for variety shows—before he hit the big time with his tales of "getting small" and maniacal explosions of "Well, ex-cuuuse me!"

You probably also had faith in Mark Spitz back in 1964 and 1968 when he predicted he'd come home with a suitcase stuffed with Olympic gold medals, only to come up empty until 1972, when he won seven.

If you recognize the name of Michael Livesay, you either have a fetish for Apple arcade games that almost make the grade, or you can spot a winner in his early stages and should be making your kill-ing in the stock market.

Three Strikes and Still at Bat. Livesay's start in the business of pro-gramming games has been a slow one. He debuted back in the spring of 1982 with *Roach Hotel*, a game that received a rather mild welcome, if welcomed at all. Livesay freely admits that it wasn't exactly an all-out effort to produce a blockbuster.

"I cranked that one out in about a month," he laughs. "It was originally [Micro Lab honcho] Stan Goldberg's idea. He saw some of the work I was doing with the little spider that hops around trying to bite your foot and said, 'Hey, why don't you put that in a game?'"

He did.

If *Roach Hotel* was an entomological version of *Pong,* then

Livesay's second game, *Peeping Tom,* was *Super Invader* with a twist. "That was another one-month job. I tried to make it different from all the other shoot-'em-up games by having the aliens hide behind the window shutters, hoping that the difference would sell the game," he recalls.

But at a time when the market was saturated with *Raster Blaster, Crossfire,* and *Gorgon,* and when it was welcoming newcomers like *Night Mission Pinball* and *Microwave,* "different" wasn't enough.

Ming's Challenge is Livesay's third game, and after a one-month advertising campaign last fall Micro Lab is still waiting for the results of the holiday shopping season to come in.

But now things are changing. Micro Lab has just released Livesay's latest, *Miner 2049er,* a game that looks like it could have sprung from such arcade powerhouses as Broderbund, DataMost, or Sierra On-Line. The flickering graphics that infested *Roach Hotel* and the blandness of *Peeping Tom* are gone. *Miner 2049er* is a combination of those jumping, climbing, and maze games that fill the ranks of bestsellers every month.

School Daze. Unlike many game writers, Livesay started gravitating toward a more serious career in computers early on. Like most high school seniors with well above average grades, Livesay went straight from graduation into college. For him, it was California State University at Northridge.

"Where else?" he shrugs. "I could see the darn campus from my bedroom window. My plan was to go there for three years and then transfer to UCLA. That way, I could enter the working world with 'UCLA' stamped on my forehead, and save all the money it would have cost to attend there."

But those plans were cut short. After two years of college, with two and a half years' worth of credits to go for graduation, he left school to take a job as an assistant programmer analyst at a local computer corporation. That job lasted about four months ("I wasn't even there long enough to get my security badge"), and he was at his next job for about the same length of time before he began exploring other avenues.

Livesay sent out letters introducing himself to such companies as (then) On-Line Systems, Sirius Software, and Micro Lab, asking if they would consider letting him create protection schemes for their software. "Apparently, most of them already had in-house people doing that work for them. Micro Lab was the only company even to send me a reply." It was a positive one.

So, a few phone calls, several signatures, and a handshake later, Livesay was on board with Micro Lab to do a number of protection schemes and several games for them. Today, the list of companies Livesay does software protection for also includes Rainbow Computing, DataMost, Human Systems Dynamics, and Datasoft.

On top of all that, Livesay has also started his own company, Livesay Computer Games, but you probably won't see or hear much about it unless you actually play its games. "I'm not that much into the advertising and marketing end of it; I'd rather just stick to the programming," says the company's founder. Instead, Livesay Computer Games will market its games through larger companies such as Micro Lab.

The current product line of his recently founded company includes *Ming's Challenge* and *Miner 2049er* for the Apple. The current project in the works is to convert *Miner* to run on the Atari 800.

And after that?

"ColecoVision," he says with a grin. "I'd really like to see *Miner* come out for the ColecoVision home arcade module.

"That doesn't mean I'm going to give up programming for the Apple or Atari, though. But my next few games will probably be for ColecoVision." To say that Livesay likes ColecoVision is like saying that Ted Turner likes sporting events. He's a fanatic. But it's not just ColecoVision; Livesay's simply an electronics gadget junkie.

A Man for Future Seasons. When you walk into Livesay's two-bedroom apartment in Canoga Park, California, you think you've taken a wrong turn off the freeway and have ended up on the special effects stage at Universal Studios.

Livesay lives alone; the other bedroom is his computer workroom. In it you'll find an Apple II Plus with three disk drives, an Atari 800 with an Atari disk drive, a color television set for programming and testing graphics, a video cassette recorder for taping games, and a ColecoVision system that he cannibalized for research purposes. "I prefer the term *reverse engineered.* I took the thing apart to see how it worked and how to program for it."

Downstairs, next to a complete stereo component system, Livesay has another color set and another ColecoVision system with *Zaxxon, Donkey Kong, Smurfs,* and *Turbo* cartridges stacked on top. To complete his video entertainment center, he has a second video cassette recorder, complete with a library of tapes that include *Tron, The Wrath of Khan, Superman II,* and Tom and Jerry classics, among others.

If you're coming out of the kitchen, be careful not to run into Livesay's three-tiered electronic keyboard setup that includes a Korg Polysix six-voice synthesizer, a Korg CX3 Hammond jazz organ, an ARP Odyssey monophonic synthesizer, and his grandmother's old Hammond organ.

"I used to be in a rock band with some friends of mine from school," Livesay explains. "But pretty soon, they wanted twenty hours a week from me. At that time, I had to make a decision between that and programming, and I chose the latter. Besides, I'm not the rock star type," he says with a smile.

Livesay is an accomplished musician, having studied piano since the age of five. And music hasn't disappeared from his life, despite his aborted career as a performer. He still plays as a diversion from programming (his favorite composers are Beethoven and Vivaldi), but he doesn't have any plans for integrating his work as a programmer with his music.

"I had an alphaSyntauri for a while, but it was sort of limiting. You just can't drag the Apple, disk drives, and monitor around to parties very easily."

Third Time's a Charm. With the days of *Roach Hotel* and *Peeping Tom* behind him, Livesay exhibits a determination to keep pounding away at what he likes best, even though past poundings bore little fruit.

If you recognize the name of Michael Livesay, forget what you may associate with it. With an auspicious future in programming games, beginning with *Miner 2049er,* Livesay is unsure of his long-range plans.

"I may go with Livesay Computer Games as a full-time thing," he says, "but with the way things are going, who knows what games will be like then? Or, I may take a full-time job in a more serious position with a larger company, keeping Livesay Computer Games on the side."

It's understandable that, at the age of twenty-one, Livesay is unsure of where he'll be five or ten years down the road. But his choice of the words *computer games* instead of the word *software* for his company's name makes it a pretty sure bet that he won't be hard to find.

GAMELINE

Ultima II

By Lord British.

Wizard and warrior—elf, dwarf, hobbit, or human—dust off your wands, phasers, light sabers, and bows. Gather up your cloaks and armor, your helms and rings, and prepare to do battle. The door to a new dimension is open, spanning all time and space; a universe of ultimate adventure and ultimate magic. *Ultima II* has arrived.

Lord British's sequel to the legendary *Ultima* continues the interplanetary fantasy saga with a creative programming flair far beyond the scope of most fantasy or adventure games.

Like its predecessor, *Ultima II* takes you on an adventure across planetary landscapes fraught with danger. Foes from pushover orcs and pesty demons to evil wizards and vicious balrons conspire against you as you travel on your quest across a scrolling landscape of marshes, forests, and plains on a variety of planets.

With each encounter you gain experience; every victory brings spoils of gold, magical items, weapons, or tools.

Deep in deadly dungeons and high in tall towers an adventurer explores three-dimensional mazes in search of treasure. Armed with a myriad of weapons, armor, spells, and tools, all available instantly at the touch of a key, you struggle to prevail against the traps and treacherous monsters that strike without warning.

In towns or villages you may buy food and supplies for the fight, upgrade your transportation, even have a drink at the local tavern, in complete safety. And here, from the inhabitants, you may gain helpful hints on playing. You may even run into someone you know. In fact, it's rumored that some members of the *Softline* staff have been seen hanging around one of the more unsavory villages.

When prices are steep, even the most noble of adventurers may resort to a little grand larceny. Beware. The brawny guards take a dim view of such activities in their towns and will give chase. Guards aren't hired for their charm, so don't let one catch up to you unless you're prepared for a knockdown, dragout fight. Bribery is sometimes a better tack.

Castles—but one—are friendly places, assuming you keep your nose clean. The monarchs are generally goodhearted (if greedy), and there's lots to see. Remember that locked doors respond to keys, and don't forget to visit the prisons.

Periodically, a time portal opens in the wilds of Ultima. Entering one instantly transports you to a different one of the five time periods of *Ultima II*. A colorful cloth map for traversing these helps a lot and doubles as a crying towel should you lose.

Time periods range from the predawn Legends era to the postapocalyptic A.D. 2112, and the available transportation varies from one time zone to another.

The goal of *Ultima II*, spanning the local solar system and all history, is to rid the universe of the evil Minax. Residing in her secret stronghold, she is the cause and leader of all the evil in the Ultima dimension. Only the strongest and most skillful of adventurers may hope to survive even the approach to her domain.

Just surviving the harsh and demanding life in *Ultima II* is difficult enough. Many are the adventurers who go to Valhalla without ever managing to enter a town or dungeon.

Programming excellence and flawless execution are the trademarks of *Ultima II*. From the unique variable-volume sound effects to the scrolling landscapes and animated oceans, it's obvious that you are in the hands of a master.

Keyboard controls are fast and simplified to single keys for quick response. There's a command for every letter of the alphabet, so keep handy the crib sheet provided with the package.

Although the Ultima shapes aren't individually animated (especially regrettable in the 3-D mazes), the symbolic shape-types are highly recognizable, much like chess pieces, and lend a feeling of significance to the game. (It's rumored that in the third *Ultima*—don't hold your breath, but you can bank on its eventual appearance—*everything* will be animated.)

Overall, Lord British has another, greater hit on his hands, a faster, drastically more advanced game that really is the ultimate in real-time D&D type fantasy games for the micro. HAS
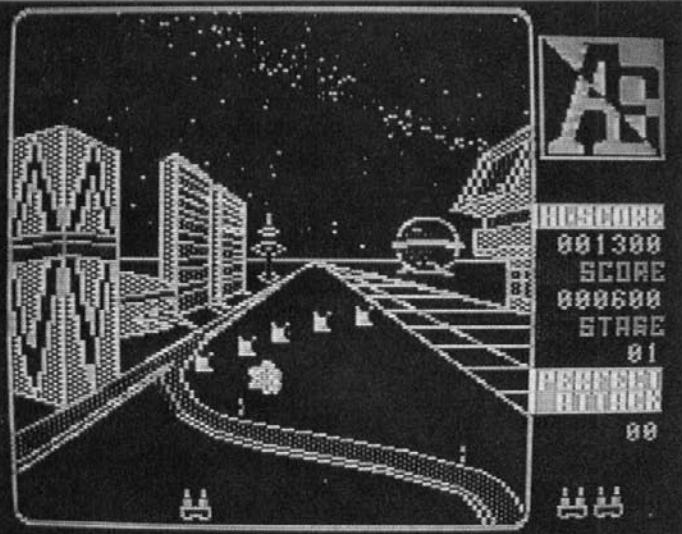
Apple II, Apple II Plus; 48K, disk. $59.95 from Sierra On-Line, Sierra On-Line Building, Coarsegold, CA 93614; (209) 683-6858.

AE

By Jun Wada and Makoto Horai.

The trouble with a lot of game producers is that, once they come up with a product that sells relatively well, they'll stick with the formula, cranking out games that follow the same pattern. Shoot this, chase that, eat these. The end result for the user is, "Oh, no, not another one!"

The trouble with Broderbund is that they release their games so fast that no matter how good one is it's pushed aside by their newer

releases. That doesn't mean that as soon as a new game appears the previous one disappears, but *Star Blazer*, *Choplifter*, *Serpentine*, and the *Arcade Machine* all had to share the limelight for a while. Too bad.

Too bad, because, with the arrival of *AE*, they're all going to have to scrunch even closer together to fit on the stage.

The last time Jun Wada's name graced the bestseller charts was about a year ago underneath his Pac-game, *Snoggle*. After that, *Snoggle* was ordered off the market and Wada quietly disappeared. Now he's returned with *AE*, the debut game from his new development company, Programmers 3.

What makes *AE* fun is the same thing that made *The Creature from the Black Lagoon* fun—special effects. Broken down to its basic elements, *AE* is a game you've seen countless times; you shoot from the bottom, they attack from the top, and they eventually get you. But then, the Creature began as nothing more than a man in a rubber monster suit. Add some 3-D effects and a variation on the missile launcher, and you have yourself a game on the level of *Choplifter*—only, if this were *Choplifter*, you'd also have to defend the post office once you'd rescued the hostages.

Even the plot is original; no killing aliens here. The AE are pollution combatants that somehow slipped through quality control inspection with failing grades. Your mission is to drive them to the outer reaches of the universe, where they won't bother your planet anymore (hopefully). Shooting them is not as simple as holding down the paddle button and waiting for them to walk blindly into your bombs, though. Wada makes you earn your points.

To shoot the AE, you press the paddle button to launch a missile and let up on the button to detonate it. This feature alone makes the game a challenge to master, yet, once you're used to this new gunning technique, your job is only beginning.

The AE snake their way through space in single file. Where the leader goes, the rest mindlessly follow. If you're good at recognizing flight patterns, you'll be ahead of the game. The plus here is that, once you detonate a missile to destroy one of the AE, most of the rest don't know enough to turn away—a dense pack if ever there was one.

The 3-D effects form an artistic backdrop for all this shooting action. Converging lines make the battle zone appear to go all the way across the horizon. Growing and shrinking AE give the impression that these critters really are coming toward you from miles away.

Despite its original approach, fine graphics, and general addictiveness, *AE* is unlikely to make you forget about Broderbund's current offerings.

Other games, however, had better watch out.   MTY
Apple II, Apple II Plus; 48K, disk. Atari 400/800 (to come). $29.95 from Broderbund, 1938 Fourth Street, San Rafael, CA 94901; (415) 456-6424.

Crisis Mountain
By David Schroeder.

Crisis Mountain is a highly addictive game of the *Donkey Kong* persuasion. In it, one must defuse nuclear devices planted in the caverns beneath a volcano. This operation is complicated by an inordinate number of boulders, rocks, and fireballs, as well as an irrepressible radioactive bat named Bertram. All the nuclear devices are equipped with timed fuses, adding to the stress.

The player sees a cross section of the volcano, complete with tunnels, ramps, and lava pits. The sundry debris tumbles down the ramps and along the paths after being spewed forth from the lava pits. Should a boulder head in the player's direction, the player must hurdle it or suffer the consequences—which vary with the type of object that strikes the player.

The player starts out with three little men, each with a total of three strength points. Should an ordinary boulder or rock hit the tiny fellow, his strength is temporarily reduced by one point. This causes him to slow down considerably. After several seconds his strength goes back to the three-point maximum, provided he doesn't collide with another object. Should a fireball or two other objects strike the little hero, his strength is reduced to a single point. With a strength of one, he can only crawl along on his hands and knees, unable to hurdle any oncoming hazards. Reduction to zero points results in our hero's demise.

To get to some of the bombs that are planted throughout the screen, the player must occasionally hurdle the lava pits themselves. Timing is critical in such endeavors; failure results in instant death.

Each of the bombs, which increase in number at higher levels, has a timer that counts down as the game progresses. The player must reach each bomb, drop to his hands and knees, and dig through the surface to defuse the bomb.

After each level sucessfully completed, there is a bonus round in which the hero can collect various bonus items including rods, novas, and a shovel and earn points for just staying alive. As soon as any injury occurs to the player, the bonus round ends, regardless of the amount of time remaining on the clock. The items appear during regular play as well and can be gathered for extra points at any time, if you have time. The shovel makes digging through to a bomb go much more quickly.

Should the hero clear all of the bonus items from the screen dur-

ing either round, he automatically enters a nova round. A nova appears; if the hero passes over it, he earns points, and two more appear elsewhere, worth more points each. If the two are won, three appear, and so on.

One of the nicest things about *Crisis Mountain* is that no two games seem alike. You can be getting along just fine and suddenly be devastated in a matter of seconds, or you can struggle all the way for a good score. There are enough things going on all the time that it never becomes boring. The only drawback is that a fair player needs about half an hour to complete a game, if not more. And, since the game is so confoundedly addicting, you can blow an evening, if not an entire week, quite easily.   HAS
Apple II, Apple II Plus; 48K, disk. $34.95 from Synergistic Software, 830 North Riverside Drive, Suite 201, Renton, WA 98055; (206) 226-3216.

Lunar Leeper
By Chuckles.

Coming to the planet of Opthamolia was not as much fun as it seemed. The Lunar Leepers have captured all your men and are guarding them on the surface of the planet. Now they have their eye on you, but you decide to attempt to rescue your people. Your only problem is that the Lunar Leepers live up to their name, so you had better look before they leap.

In most other space games, your object is to destroy everything in sight. The first part of *Lunar Leeper*, however, is very different. Your goal is to rescue the captured humans and bring them back alive. Of course, the Lunar Leepers carefully guard the humans. If a Leeper gets too close to a human, it will zap him instantly. They will also leap off the surface of the planet in attempts to grab you or one of your rescued men. To complete the first part, you must rescue all the humans or destroy all of the Leepers. Bonus points are awarded for each Leeper that has *not* been killed.

The second part takes you to caves that descend to the heart of the planet. Here, it's no more nice guy. After all, everyone is entitled to a little revenge. Your goal here is to destroy the Eye, the ruler

of the planet. The Eye is protected by Trabants, which look like the Eye's offspring.

Sound easy so far? Well, there's a catch. Your fuel and lasers are limited. You can refuel, but it is sometimes difficult to get to the refueling stations on time, so it is very important to watch your fuel gauge. When in the caves, there are no refueling stations so you must act quickly.

By the third level, the Trabants have discovered their way out and are patrolling nearby. The cute little one-eyed Leepers aren't so cute anymore and there are many more of them.

Lunar Leeper is very addictive, and you'll probably lose hours of sleep over it. (This problem can solve itself: just start counting Leepers at bedtime.) AM

Apple II, Apple II Plus; 48K, disk. $29.95 from Sierra On-Line, Sierra On-Line Building, Coarsegold, CA 93614; (209) 683-6858.

Shamus
By William Mataga.

Without preamble, *Shamus* is the best cross between arcade and adventure games currently on the Atari market. It exploits all facets and strengths of a computer: color, fast action, highly visual graphics, and sound (it is, in fact, one of the few games in which careful listening will produce better scores).

To know it is to love it, play it constantly, and not get enough of it. In an industry where attention span is everything, *Shamus* has the imagination and depth that demand repeat play.

The disk boots to a melody familiar to all who remember Alfred Hitchcock's television series, followed by your introduction to the game's persona, good and bad. Good are keys, keyholes, small vials that give extra lives, and question marks (which might be extra lives but usually increase the score); bad are spiral drones and robodroids—both heavily armed—and snap jumpers and the Shadow, which merely (!) pursue.

As the game begins, you're in a large chamber bordered by black emptiness. This is room zero, level black. There are three more levels (blue, green, and red), which average thirty-two rooms apiece. The maze itself is not trivial; many of the chambers are locked and cannot be opened without the correct key.

You can't plot the maze in uninterrupted safety, however, because of the uncooperative creatures in each room. Early chambers contain only a few spiral drones. Robo-droids appear by room 15. Both of these monsters move slowly and are relatively easy to dispatch. Snap jumpers turn up a little later. Although they don't shoot anything, their instantaneous materialization from one spot to another (a hopping trait that, along with their green color, earns them the nickname of frogs) makes them formidable foes. Finally, if you stay in any room too long, an ominous musical cue signals the arrival of the Shadow, which moves rapidly and cannot be killed—only frozen briefly.

The player is represented by a cute character (Shamus) in a hat, controlled by a single joystick. You can move in four directions and shoot ion-shivs in eight. The supply of shivs is unlimited, which is handy; rooms in the fourth level easily contain forty creatures, all of which you should dispatch before retrieving any keys or vials. Shamus must not touch any walls (which are electrified) or creatures; either will result in the immediate demise of one of its five lives.

Author Mataga has left just enough time for a reasonably skilled player to clear a room, pick up any treasures, and leave before the Shadow arrives. This leaves no time for a single player to map the maze. Either a friend or infinite patience (and repeat plays) is needed for that. Even so, the action becomes so furious by level three that most players will be lucky to get that far even if they know where they're going. The pace is relentless and allows for a breather in only one type of room: several keys and vials are guarded by twin bands of energy with holes large enough to allow an ion-shiv, but not Shamus. Once a shiv makes it through the hole, the bands disappear and the room fills with creatures. Prior to doing that, however, the player can snatch about thirty seconds of rest.

To further complicate matters, a room cleared of hostile forces repopulates immediately for a second visit. Rest assured, the maze and key placements require the player to cover much of the same ground more than once.

The ultimate goal is to find the way through all four levels to defeat the Shadow in its lair (the Maze and the Minotaur, anyone?). But the game keeps track of high score, and you can earn more points by destroying all wayward critters as you encounter them.

Shamus is a wonderful game: fun to play, exciting, colorful—and taxing. And it's one game to which you'll always return. DB
Atari 400 or 800; 16K, disk. $34.95 from Synapse Software, 5327 Jacuzzi Street, Richmond, CA 94804; (415) 527-7751.

Repton
By Dan Thompson and Andrew Kaluzniacki.

Gorgon, move over; *Defender*, don't bother; Sirius Software presents the latest in ultra-fast-action arcade games: *Repton*.

Leading a squadron of ultrasophisticated fighter ships (one at a time) in a desperate attempt to defend your home world of Repton, a player must stand alone against the hordes of evil Quarriors.

Grimly determined to take over and rebuild the planet for their own colony, the Quarriors fight with a multitude of baddies, materializing out of hyperspace all around the lone Repton fighter.

The enemy is many. Nova cruisers divide into smaller but even more deadly Single ships when hit. Although Spye ships don't fire, they hang in the air waiting to intercept oncoming Repton fighters. The Minelayers carry an endless supply of small floating mines that track the fighter—contact means instant death. Dynes periodically fire lethal energy bolts horizontally over the city. The Draynes draw the last of the city's power up in an energy beam, sucking the city dry. Although they are the most vulnerable of the enemy ships, it's best to refrain from shooting them, intercept the energy beam, and return the energy to the city through the input station.

The enemy base, built with blocks cannibalized and carried from Repton homes and buildings, is heavily guarded by a wall of surface-to-air missiles. Attack is nearly impossible.

With such terrifying odds, what chance do five lone fighters have?

Your Repton fighter, *Armageddon*, is equipped with the very latest in technological weaponry. Forward blasters fire a near continuous stream of lethal energy bolts. The near infinite duration force shields are impervious to all enemy weaponry and render the ship invisible to detection. Radar screens and instruments detect the enemy's location as soon as they materialize. Ground communication warns of further materializations and alerts the defender of energy theft. Fighter ships are further armed with five "nuke" bombs that will clear an entire sector of Quarriors.

If the Quarriors are successful in completing their base, as a last resort the Reptonians have a final provision against occupation, the devastating "Armageddon Bomb," which renders the entire surface of Repton uninhabitable.

Alas, the Quarriors are resourceful as well as deadly and have rebuilt their base underground. Now the battle is waged in the great caverns hollowed out beneath the planet's surface. The last hope of the nearly doomed natives is a desperate mission: a final run across an entire sector of super heavily defended enemy strongholds in a suicidal attempt to knock out the enemy power generator.

Radar inoperative, shields gone, nukes too risky; the fate of the entire planet hangs in the balance and the enemy is coming at the lone fighter with everything they have. Will planet Repton live to breath free?

Along with faultless animation, *Repton* has many of the convenience features: control toggles from keyboard to joystick, sound on/off, and a pause that alters screen color to help preserve your picture tube.

With all its special effects and high-speed action, *Repton* has earned the Grud seal of approval as a "killer game."

Be warned: *Repton* is more than a match for most cadets; only the greatest fighter pilot will prevail. HAS
Apple II, Apple II Plus; 48K; disk. Atari 400/800; Commodore 64 (to come). $39.95 from Sirius Software, 10364 Rockingham Drive, Sacramento, CA 95827; (916) 366-1195.

The Mask of the Sun

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

Your search for the Mask of the Sun has brought you to Central Mexico. The information you gathered has led you to believe that the mask is located in one of the ancient Aztec ruins. But you must act quickly because the pills keeping you alive are limited and your supply is diminishing. Your time is running out and the curse is causing you to grow weaker and weaker. . . .

An innovative new company introduces a new style in adventuring in *The Mask of the Sun*. Unlike previous graphic adventures, you never see a picture fill in with color. Aha, you say, then it's in black and white! No—*Mask* has fine color graphics, and they're very realistic.

But the most exciting innovation in *Mask of the Sun* is movement from place to place. When you choose to move to another room in the adventure, you don't just disappear and reappear in a different place. You move in that direction, seeing the scenery along the way pass by and your destination come up in the distance.

Believe it or not, there's more. Several parts of the adventure are animated. Carved faces talk; a deadly animal attacks; and a statue amazingly transforms itself. Many animated events require your quick reaction, and the penalty for failure is usually fatal.

The puzzles in *Mask* are very good. Some are considerably easier than others, but don't be fooled: there's often more than meets the eye. One of those easily solved puzzles may be the key to the answer of a difficult puzzle required to complete the game.

The excellent, detailed graphics are accompanied by upper and lower case text.

The documentation could be more explicit. It would be useful to know, for instance, that once inside the pyramids the conventional commands of north, south, east, and west are no longer effective. You must use forward, backward, left, and right instead.

The Mask of the Sun is the first game from Ultrasoft and it will certainly establish a reputable name for the company. The people at Ultrasoft are clearly eager to please the software buyers.

All in all, *The Mask of the Sun* is a very good graphics adventure for the average to good adventurer. **AM**

Apple II, Apple II Plus; 48K, disk. $39.95 from Ultrasoft, 24001 S.E. 103rd Street, Issaquah, WA 98027; (206) 392-1353.

Astrowarriors

By Paul H. Smith.

Of the increasing number of multiplayer Atari games, one of the best is a space war game entitled *Astrowarriors*. You pilot your AstroCruiser through outer space, on your mission to destroy all enemy AstroCruisers (which are controlled by up to three additional players) and become the master fighter of the universe. During each mission your ship is equipped with photon missiles to eliminate the enemy and shields to protect yourself as the space combat heats up the universe. The battling aircraft must also avoid plummeting into each other, using excessive energy, and encountering various obstacles in outer space, such as asteroids, astral bodies, and black holes.

All the ship's controls are programmed through the joystick. Each AstroCruiser has the ability to hyperspace to other parts of the universe, rotate 360 degrees clockwise or counterclockwise, and fly forward at various speeds by manipulating the ship's thrust. As the battle intensifies, your most precious commodity becomes energy. As your energy supply becomes depleted, the ship may lose some of its flight control mechanisms or defensive capabilities, thus becoming more vulnerable. The pilot can always view the cruiser's status panel to see the operating efficiency of eight different functions that are crucial to the fighting ability of the warcraft. Each ship is also equipped with fusion reactors to replenish energy from intergalactic hydrogen, but this takes valuable time.

Its thirty-two different options of play make *Astrowarriors* a continual challenge. There are four different levels of ship speed, which constantly tests your flying ability. In addition, there are four different playfields to choose from: Free Space, in which there is no gravity nor any heavenly bodies; Asteroid, in which the players must avoid colliding with a centrally located asteroid that has no gravitational pull; Solar Orbit, in which the fighting cruisers must not only deal with each other, but also avoid being sucked into the sun with

its strong gravitational pull; and Black Hole, where the center of the universe is a black hole that not only possesses the gravitational pull of the sun, but can't be seen.

Astrowarriors has a one-player practice mode and can be played by two, three, or four players. Anyone who enjoys space games and a good, challenging shoot-'em-up will find this a welcome addition to their software library. GR/MR

Atari 400 or 800; 16K, disk or cassette. $29.95 from Apogee Software, 9615 Farralone Avenue, Chatsworth, CA 91311; (213) 882-9358.

Wavy Navy
By Rodney McAuley.

Nobody can say that Sirius Software is devoid of down-to-earth games. That's exactly what their latest release is.

A few years ago, *Apple Galaxian* (a.k.a. *Alien Rain*) made waves in the market by luring players away from the ever-popular *Super Invader* (a.k.a. *Space Invaders*). They were similar games, with *Galaxian* advancing to color graphics, faster moving targets, and aliens that not only shoot from above, but swoop down as well while you go running for cover.

Apple Galaxian was popular, blowing away all other games that came out at the time as well as its primitive predecessor. One of the earliest high scores reported in *Softline* for this game was amassed by a relay team. The game was not a loser.

Wavy Navy takes the popularity of this space game and brings it down to earth—sea level, to be exact. Instead of aliens, it's kamikaze fighters and helicopters. Instead of a spaceship, you control a PT boat. If it sounds dull, you're right—it *sounds* dull. But, surprisingly, it's not.

Variations on a theme in hopes of equalling the popularity of the original can be dangerous. If the variation comes close enough for recognition but falls short in key aspects, it risks bombing in the market. If it succeeds in being indistinguishable from the original, it risks lawsuits. *Wavy Navy* successfully dodges both.

In addition to moving horizontally, you move up and down, too. But you can control only your horizontal movement; swelling waves provide the vertical movement. The enemy bombers and kamikaze fighters are wimps, sitting ducks in the air. The real pests are the machine-gunning helicopters that come close enough to give you a $4 trim and try to turn your boat into Swiss cheese. These guys know where you are.

That would be enough to make the game undull. Now let's go for down-to-earth excitement. On higher levels, you must also dodge sea mines, a bomber's inexhaustible supply of bombs, and Exocet missiles. Expect no mercy.

Besides adding a new twist to the invader theme, *Wavy Navy* offers some features that make losing a semi-enjoyable experience. At the completion of each round, you're promoted to the next rank and treated to a few bars of sailor music—a different tune each level—in two-part harmony, created with Paul Lutus's *Electric Duet*. Once you've mastered ten rounds, you go to the next level of play.

Wavy Navy also gives you the option to start at beginner, advanced, or expert levels after you boot the disk; a gem for gunners who don't want to wade through the early rounds.

Super Invader was revolutionary, and *Apple Galaxian* was a breakthrough. *Wavy Navy* is different. A television ad for the game would say, "New and improved." MTY

Apple II, Apple II Plus; 48K, disk. Atari 400/800; Commodore 64 (to come). $34.95 from Sirius Software, 10364 Rockingham Drive, Sacramento, CA 95827; (916) 366-1195.

Sherwood Forest
By Dav Holle and Dale Johnson.

The eyes have it: Everywhere in this charming adventure, people or creatures are winking at you.

You are Robin Hood, suffering from a temporary loss of memory due to a clout on the noggin from the villainous Sheriff of Nottingham. Matters are complicated by the fact that you were supposed to tie the knot with the fair Maid Marian on this very day. And you don't even have your standard issue suit of Lincoln green! Your task is to find the maiden, woo her, and get her home to the bridal suite.

Sherwood Forest is populated by some familiar names, but don't anticipate their behavior on the basis of some silly legends you read as a youngster. You can safely assume that the sheriff is not your friend and that there is little to fear from the Merry Men, but beyond that you're on your own.

The graphics—UltraRes, no less—are wonderful. "Softoon Adventure #1" shines in the good-natured cartoons of Dav Holle and the humor of the prose. Very few of the comments are totally innocent. The characters are just that: characters, not objects or blobs. The tax collector is about as shifty a fellow as you'd care to meet, while the Merry Men are a seemly bunch of rowdies. Several of the pictures are animated, although there is no interaction involved. There are also some delightful responses to frustrated comments.

Technically, *Sherwood Forest* shows equally good craftsmanship. The screen redrawing is about as fast as any around, while the response to commands and the save/restore game functions seem to take no time at all. There is little or no color bleed in the graphics; there are no fuzzy areas or objects recognizable by name only. Disk access is short and sweet.

There are no non sequiturs in this game, no obscure knowledge of arcane lore needed. The puzzles are tough but eminently fair, and there are plenty of clues for those clever enough to spot them. There are a number of pitfalls to be avoided; consequently, it pays to save the game frequently. The game does not point out spelling mistakes by "not recognizing" words, so make sure you said what you intended to say before giving up on something. When in doubt, look around.

What makes *Sherwood Forest* work is its character. The graphics are very sunny and cheerful, with a lot of personality. The narrative voice is consistent and witty, occasionally offering hints along the way, at other times reprimanding the player with mock gravity. There is very little violence in the adventure, and what there is seems proper in the cartoon setting. While the game is not endowed with a particularly complex plot or painstakingly detailed pictures, it has a good deal of charm. As such, *Sherwood Forest* deserves a place in the first rank of adventures. DA

Apple II, Apple II Plus; 48K, disk. $34.95 from Phoenix Software, 64 Lake Zurich Drive, Lake Zurich, IL 60047; (312) 438-4850.

Track Attack
By Chris Jochumson. Atari translation by Bill Hooper.

It is wonderfully refreshing to see an "Apple" company converting their programs for the Atari computer and taking the time to learn that each of these machines excels in a different area. Too often, when a translation is done, while the game may play the same, the graphics and sound leave a lot to be desired. In this case, Bill Hooper (responsible for the outstanding graphics and sound in Gebelli's *Match Racer*) has made a remarkable translation.

As you boot up, you'll marvel at the detail of the animated title page. It's truly a work of computer art. The game itself is comprised of three separate scenarios. In the first, you control your souped-up '86 Pierce Apple attempting to rob a four-car train of its gold. To do this, you ram the gold-laden cars of the Broderbund Express at various railroad crossings. You can't run into the engine or empty cars, so your timing must be exact. Trying to stop you from accomplishing your dastardly deed, a phantom watchman patrols the roadways. If he can't run you over, he'll try to recoup the railroad's losses by stealing back the gold you thought was safely deposited in your hide-out. Up to 128 bags of gold can be stolen, but you only need to steal one to advance to the second screen.

Once again, you will be treated to the front cover picture, a detailed close-up of the train riding along the tracks. You have jumped the train at the caboose, and via a well-timed series of downward jumps and upward somersaults you make your way to the engine and steal the whole train. The computer will take over and carry you to screen number three.

Here you must drive the train along the tracks, picking up as many of the eleven gold pieces strewn around as you wish. Gathering them all will earn you a free man; however, the phantom watchman is back, and if he collides with the train you go back to the first screen minus all the points you earned in screen three. When your

nerves have had enough (or you've collected all eleven bags of loot) you begin again on screen one.

All facets of this program are topnotch. This is one of the only games in which the joystick functions are different depending on where you are in the game. Due to the addictive qualities of the game, the programmer has taken the arcader to heart and given him the option to eliminate the train's chug-a-chug, although the sounds are another of this program's excellent touches. There are two levels of speed, but this game is hard enough without having Mario Andretti at the wheel. Another feature allows you to save your high score to the disk.

Track Attack is an original game that makes good use of the cops and robbers theme, an area that has been sadly overlooked in these times of extraterrestrial warfare and adventure.   GR/MR
Atari 400 or 800; 32K, disk. $29.95 from Broderbund, 1938 Fourth Street, San Rafael, CA 94901; (415) 456-6424.

Aztec
By Paul Stephenson.

Aztec, by the author of *Swashbuckler*, combines the skill of arcade play with the quest and puzzles of the role-playing fantasy game—all set in a foreboding Aztec pyramid. Achieving the goal—to find a legendary golden idol hidden within—is fraught with peril. Ferocious tigers and dinosaurs, poisonous spiders and snakes, and the bones of archaeologist Professor Von Foerster are just a few of the obstacles conspiring against you in your quest. The ancient Aztecs themselves have left behind their own devious assortment of booby traps and guardians to defend their temple treasure.

Into this cauldron of danger, only the bravest of adventurers may go. Having followed the professor's trail, you have uncovered the Aztec pyramid, buried by the passage of the centuries.

As in an arcade game, you control all the hero's moves from the keyboard—a joystick would be hopelessly inadequate. You walk through ancient rooms, place explosives, run from pursuing creatures of all sizes and descriptions, jump over traps, and climb over or shoot and hack your way through obstacles.

This is no ordinary arcade or adventure game. The hero and the multitude of creatures that inhabit the chambers are drawn and animated in great detail.

Temples consist of eight levels, each level of eight rooms, and each room of three floors. The temple setup varies from one game to the next, drawn from thirty-two random possibilities. It's "peopled" by guardians—man, monster, and undecideds—selected according to the player's chosen level of difficulty.

Often there are no stairways connecting floors, and sometimes floors dead-end against a wall or, worse, let the hero fall off as he enters a room without an adjoining floor. The fall itself isn't fatal, unless he falls on a tiger or a serpent, but the hero will see stars and may remain unconscious as danger looms.

Getting down is usually little trouble as the ever-prepared hero always carries three sticks of dynamite and there's more to be found hidden in the temple; blowing a hole in the floor is one way of going down. Getting out is the trick. The instructions promise a reasonable—if not always easy—answer and a way out of any situation.

While the sound effects are negligible, the control, game design, and animation are good examples of the state of the art in Apple arcades. The author's oversight of some kinds of finishing touches seldom affects play. (Don't run into the next room after setting dynamite. . . .)

Scoring is calculated by the skill level chosen and the time needed to find the idol and escape. No bonus points are given for gratuitous violence.

And, of course, any resemblance between this game and *Raiders of the Lost Ark* is sort of coincidental.   HAS
Apple II, Apple II Plus; 48K, disk. $39.95 from DataMost, 8943 Fullbright Avenue, Chatsworth, CA 91311; (213) 709-1202.

Guest reviewers in January were Dave Albert, Derrick Bang, Alan Mankovitz, Gary Rose, Marcia Rose, and Howard A. Shore. SL

How Much Is That Software in the Window?

What was the worst game you saw in 1982?

Seriously. You put in the disk/cassette/cart, flipped the switch, looked at the screen, and said, "I don't even stinkin' believe it!!" And you couldn't get your money back because it was supposed to look like that. We're talking major bow-wow action.

You know what we mean. We want to hear about the biggest disappointments to have escaped from the play testers and lived to afflict your screen in calendar year 1982.

Vote for the three most vivid in your memory, in order of dreadfulness, and describe, in painful detail, the socially unredeeming values of each and your personal experience with them. Apple people vote for Apple, Atari for Atari, and so on. Each game that receives the most votes on each computer will be deemed the "winner," and a prize will be awarded in a random drawing from the letters of all those who gave it a first place vote. (Not all computer categories will have a winner; one vote for a Heathkit *Asteroids* cassette, for instance, doth not a contest make.) The prize will be one of our personal selections, direct from *Softline*'s deepest, darkest software vaults, and will be appropriately dreadful.

Nominees can be shadowy stinkers from somebody's garage that barely booted and major sunken souffles from the big boys alike: we're not choosy. You certainly weren't.

Deadline: February 20, 1983. Losers to be announced in these pages. Send your nominees to Softline Dog, Box 60, North Hollywood, CA 91603.

(. . .)

Kudos to the *Jersey Atari Computer Group Newsletter*, December 1982 issue, in the silk-purse-out-of-sow's-ear department. Coming up with an inch and a half hole after all the articles were laid down, the staff chose to flaunt it rather than fake it. In the process, the newsletter provided its readers with a thought-provoking paradox. Here, reprinted with permission, is the *JACG Newsletter*'s profound blank space:

THIS SPACE INTENTIONALLY LEFT BLANK

The newsletter is definitely a newsletter in format, size, and paper stock, for example, but it's slick by virtue of pretty well written and informative articles. Could this be the *Call–A.P.P.L.E.* of the Atari world in the making?

The Jersey Atari Computer Group swings in High Bridge, New Jersey. If you live around those parts, love your Atari, and wonder what a user group is, or what a jersey is, or what a high bridge is, you might get in touch with **Richard Kushner**, JACG's president, to see what they do and whether they'll let the likes of you do it too. His phone, in the evening, is (201) 638-8732. That's presumably his phone in the daytime too; call then if you like listening to the no-answer ring.

More numbers of the evening, and full-time addresses, are: (201) 366-6862, 5 Starling Drive, Randolph, NJ 07869; and (201) 887-2861, 40 Lawrence Road, Parsippany, NJ 07054. The first is for treasurer **Rick Olson**, who's always got a hand out for $15 dues, which'll get you the newsletter and other good things, even if you live too far away to attend meetings; the second is for newsletter editor **Art Leyenberger**, who's the person to scream at if you don't like an article ("This month, I hate *the*, and you printed four hundred twenty-six of them!") and the person to submit manuscripts to if you think you can do better (or as well).

We Will Jump You

Yes, it was the third rerun of the fall premiere show of *Saturday Night Live*, and it was the third time we couldn't really tell if that was a Sierra On-Line *Frogger* T-shirt that **Queen** guitarist **Brian May** was wearing. The guy won't stand still! (Could be a clue.)

Speaking Of Which

The Sales Technique of the Year Award goes to **Sierra On-Line** for their booth at last November's San Francisco Applefest: a big-screen TV, running *Frogger* . . . lots of little kids lined up to play *Frogger* . . . lots of people lined up to buy *Frogger* to play on their Apples . . . and an Atari 800, on which the game was running, tucked unobtrusively under the TV console. Y'see, the two versions aren't quite exactly the same, and . . . oh, you heard that?

Ambulance Chasers

Thanks to the largesse of author **John Besnard** and publisher **Southwestern Data Systems**, it's now possible to play one game on your computer at work and escape detection. The game, so unpronounceable that it goes under the alias of *Alien Game*, has a control-W function that can flip a spreadsheet onto your screen the instant you hear your boss's approaching footsteps. Although it's been hailed by the young and lazy at heart as a breakthrough, it looks like there'll be added costs for the publisher if **Slipshod Software** carries out its threat to sue. Slipshod introduced a similar concept in its widely acclaimed *Cropduster* business-arcade simulation program (soon to be released for the Timex), in which certain player actions will actually boot *VisiCalc*. Slipshod claims that the concept of integrating spreadsheet and arcade packages is a proprietary feature of Slipshod Software Ltd., and they will seek appropriate redress in the courts.

SDS prexy Roger Wagner reacts with heated anger to announcement of threatened Slipshod Software lawsuit.

In a Christmastime clash of titans, **Atari, Inc.**, filed suit against **Coleco** in U.S. District Court, northern district of Illinois, eastern division, charging patent infringement and unfair competition under state and federal law. Specifically, they want a preliminary and permanent injunction against the manufacture and sale of Coleco's Expansion Module #1, which allows Atari's VCS-compatible cartridges to be played on the Colecovision home video game unit. The patents in question cover player-missile graphics and the digital generation of sound suitable to video games.

"We regard the Coleco adapter as merely a thinly disguised copy of Atari's VCS unit," says Atari chairman **Raymond Kassar**. "In the same way that we will not tolerate the copying of our software, we will not allow the duplication of the unique circuitry in the Atari base unit. Along with consumers, we expect any manufacturer that enters the marketplace to be innovative and creative in their design efforts."

Actually, a lot of Coleco owners thought it was a pretty hot idea and bought the unit in anticipation of the adapter "to come"; they may now be left holding the cartridge. It's a jungle out there. Aren't you glad you bought a computer instead? Although, if it was a Commodore machine, they've got your number, too. Atari recently rained on Commodore's parade, obtaining a preliminary injunction in regard to joystick patents.

But while they were giving the competition a blue Christmas, Atari was also giving two hundred coin-op games to San Francisco Bay Area charities and other special organizations—all games placed on "free play," natch. According to Atari coin video games division honcho **John Ferrand**, "We were looking for a way to put something back into the communities that helped give Atari its start ten years ago. These games are our way of saying 'thanks.'" Lucky organizations include the Red Cross, the Christmas Exchange of Santa Clara County, and the Holiday Project.
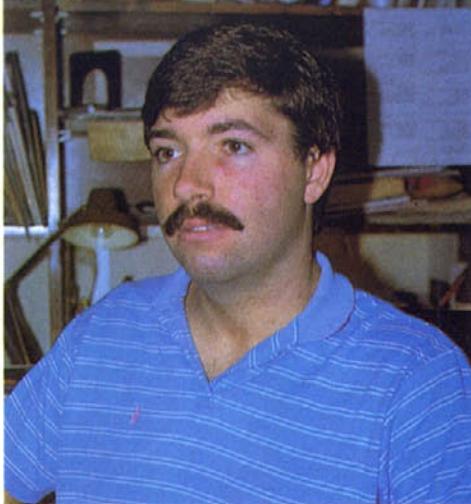
Another 250 games have gone to the "Magic Me" project, a group of children in Baltimore, Maryland, who regularly visit the residents of Baltimore area nursing homes. It was not specified whether these games will be for the use of the children or the nursing home residents . . . but what a nice company.

Santa, critically overstocked, takes time out from demonstrating video football to make holiday gift suggestions to customers.

Eyestrain

This month's Relevance in Packaging Award, with Flying-Snakes-and-Ladies-in-Bondage clusters, goes to **Saber Software** for the visually striking cover of their Apple adventure, *Demon's Forge. Softline* play testers have rigorously examined all the rooms in the game, the program code, the documentation, and the protection scheme, and have, as yet, been unable to find evidence of one naked woman tied to a pole. In fact, we could find no women at all, even clothed. No snakes, either. Kudos to **Brian Fargo** for stumping us so well. We'll keep looking, fella. (Nice game, too.)

Stay back, darling, it may be a trap. Only Brian Fargo knows the whole story, and he can't quite remember.

Apple owners can now enjoy *inCider* from **Wayne Green Publishing.** Do not look upon this as an employment opportunity if you smoke the evil weed that makes a chimney of your nose: Green won't hire you, even if you swear to do your puffing in your closet at home. These rules do not apply to advertisers or subscribers.

With more games coming out for the IBM Personal Computer, gamers should start watching for developments in the marketplace. One of the more interesting has to do with business games: *PC* magazine, according to founding patron **Tony Gold,** was an artistic success but a commercial failure. So he unloaded it to **Ziff-Davis,** who previously had bought *Creative Computing.* This move apparently so incensed publisher **David Bunnell** and the rest of the staff that they quit to start a competing publication called *PC World,* scheduled to begin publishing this month. Ziff-Davis is threatening to sue Bunnell, but, considering that the magazine's always been a month late in subscribers' mailboxes, they may want to reconsider and offer him a bonus for leaving promptly.

Endless Law

Okay, just one more item from the fascinating world of legal hassles and then we'll go hassle somebody else.

Everyone started using it, then **Broderbund** contemplated using it, on the rationale that everyone was using it so it's generic. **Sierra On-Line** finally put its foot down, reserving all rights and title to the term *hi-res adventure,* because they said it first.

They are currently in court with **Phoenix Software.** "We have to do 'em one at a time, or they'd keep me so busy I couldn't go skiing," says On-Line copyright legal eagle **Vic Sepulveda.** "They've gotten three continuances on the preliminary injunction and the hearing is now set for January 31."

Did you know Sierra On-Line sued Atari before Atari sued them? True. Right after Atari accused the original (or not, so they said) *Jawbreaker* of infringing on *Pac-Man,* On-Line sued them for suggesting such a thing. Everything is now settled amicably. Believe it or don't.

What th—?

Jim Nitchals is one of the worst poker players in the world.

Making Waves

Hey, wasn't that **Steve Wozniak** in a souped-up Speedo swimsuit getting ready to cross the **English Channel?**

Well, yes. San Francisco Bay Area television viewers had the chance to do a quick double take last November when

Magazine Watch

Commodore, they certainly do make some hot little computers, don't they? You saw the ads and you said, "Wow, look at all those things it can do! Look at how cheap it is!! Want it, want it, *wannit!!!!*" And now you got it and you're looking around for some programs to run on it, and praying to the gods of glitch that nothing ever goes wrong so you won't have to send it to their service center in Abu Dhabi, and just generally wondering if there's any place you can go to find out anything at all about this little wonder.

Pathetic.

Well, we feel duty-bound to inform you of the existence of a publication called *Strictly Commodore*, a Canadian periodical that features programming tips and software and hardware product listings and reviews and runs a user group.

The first issue (September 1982) is a pocket-sized thirty-four-pager and looks very much like your basic high school underground poetry magazine, which can be kind of a drag when you're trying to type in a washed-out, reduced photostat reproduction of a program listing. This may improve with time. Send inquiries, good wishes, and money ($18 for a U.S. sub) to Strictly Commodore, 47 Coachwood Place N.W., Calgary, Alberta, Canada T3H 1E1. Canadian subs are $20. (Like, you guys have to pay more even, like, in your own country. What a burner, eh?)

The mag is actively seeking well-written, informative articles and software reviews for the Vic-20, Pet, CBM, and SuperPet. It modestly declines to state how much it will pay you for your efforts in this regard. In all modesty, we would probably pay you more.

David Ahl, founder and publisher of *Creative Computing*, has announced a new offering for the new year, *Video & Arcade Games*. Ahl is one of the few computer magazine publishers with a high interest in electronic gaming, so the rag should be a hot one. Watch for it on your newsstands and pray it doesn't feature games from Creative Computing's software division. (Well, *Micro Golf* was nice. . . .)
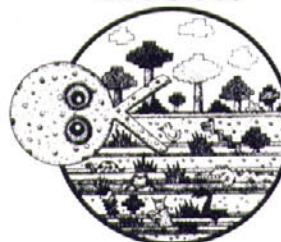
the KGO-TV evening news aired a brief film clip of seventy-six-year-old Steve Wozniak in training for the grueling swim.

Pulling off the Us Festival was one thing (though the experience seems to have aged him considerably), but in challenging the likes of **Brian Goodell, Mark Spitz,** and **Florence Chadwick** Woz is really stretching the creative frontiers of human potential.

New Stuff

Atari: *Castle Wolfenstein* Now Available for Atari! That's right, the semi-fantasy/arcade game that caused all that excitement on Apples in 1981 and still makes the bestseller lists is now available for the Atari 400 and 800 home computers. Locked chests, secret plans, guns, grenades, relentless storm-troopers shouting at you in German . . . "You need quick responses and quick thinking if you hope to escape from the castle alive!" That's right, kids. If this is anything like the Apple version, it's worth a look. $29.95. **Muse**, 347 North Charles Street, Baltimore, MD 21201.

Swamp Chomp takes you to the land of Muckedoo, wherein you must slog across an unfriendly swamp to get to a feeding station, eat like crazy, jump into a flying machine, and return across the trackless wastes, this time in chomp mode so you have a fighting chance. Thirteen levels. From **John** "Moonbase Io" **Konopa**. 24K, disk or cassette. $29.95. **PDI**, 11 Idar Court, Greenwich, CT 06830.

Knuckling under and admitting that there are folks who play games on computers too, Sirius has released *Fast Eddie, Turmoil,* and *Fantastic Voyage* cartridges for the Atari 400 and 800. $34.95. Additional VCS cartridge adaptations of the near future will include *Worm War I, M*A*S*H, Flash Gordon,* and *Deadly Duck*. Also coming soon, though requiring a disk drive: the Atari version of **Tim Wilson**'s *Blade of Blackpoole,* an illustrated adventure. $39.95. *Twerps* is a three-phase mission of mercy and arcade shoot-'em-up from **Dan Thompson**. $34.95. **Sirius**, 10364 Rockingham Drive, Sacramento, CA 95827.

TRS-80: The *Cyberchess Chess Improvement System* alleges itself to be not just another computer chess game; rather, it is a vast and expanding chess improvement system. It starts you off with a system program

pack, which includes two fully analyzed amateur class games and two pro games, and goes on through a library of one hundred program packs, with more on the way. Model I and III. Four-game system package, $29.95. Game disks, $19.95. **IJG**, 1953 West 11th Street, Upland, CA 91786.

IBM pc: Ten offensive plays, five defenses, interceptions, fumbles, penalties, punts, strategies, touchdowns, field goals, extra points, and time outs; no traffic jams, rancid hot dogs, punks in the parking lot slashing your tires . . . these are what you will and will not get, respectively, in *Pro Football Game*. Both teams are equally matched, and you have the option of playing against a human competitor or against your pc . . . just don't make it go into sudden death. 64K, pc-DOS, BasicA, eighty-column. $23.75. **Strategic Alternatives,** 459 Homer, Suite 2, Palo Alto, CA 94301.

Apple: A new line of software from a new company features several items of interest. *Caves of Death* is a D&D simulation with sound and hi-res and low-res graphics. Familiarity with fantasy role-playing recommended. $29.95. *Holy Grail* is an adventure with a slightly confused mythology in which you must find the grail before the stroke of midnight (when mighty Excalibur turns into a pumpkin—just kidding). Not to be confused with *Quest for the Holy Grail*. $19.95, disk; $16.95, tape. Also available is *Character Catalog*, a D&D character generator that rolls up basic characteristics and lets you shop for equipment, create personalities and secondary characteristics, save characters on disk, and make a hard copy. $19.95. *The Apple Pallette* is a hi-res picture generator with which you can create pictures and save them to disk using joystick or keyboard. $24.95. All these programs are unprotected, and all are from **Fantasystic Software**, 7905 Rodgers Road, Elkins Park, PA 19117.

Artesians has been developed as "a nonviolent and nonsexual game . . . and yet, hiding as attributes are all those things that capture the imagination and evoke response from every level of player . . . with a need for structured thought and planning found only in adventure games, such as Dungeons and Dragons . . ." it says here. Sigh. What it *is* is a four-level arcade game in which you negotiate the successive floors of a building to fill up your water jugs, and then get back down avoiding the watchman, the watchdog, and the affectionate title creatures. No resemblance to *Beer Run* nor to a hit program. $34.95. **Renaissance Technology,** 1070 Shary Circle, Concord, CA 94518.

From the folks who brought you *Beer Run*, however, there is now *Flip Out*, a nine-course animated strategy game in which you drop ten marbles through a series of traps, hopefully causing the appropriate chain reactions to get all your marbles out the bottom before your opponent can. $29.95. **Sirius**, 10364 Rockingham Drive, Sacramento, CA 95827.

Hordes of tireless aliens once again prove they can't leave a major urban area alone. *Night Falls* features nine levels of play "from beginner to impossible." No resemblance to the classic Isaac Asimov story. Paddles or joystick. **Omega Microware**, 222 South Riverside Plaza, Chicago, IL 60606.

Crystal Caverns are what you have to stumble through—text-style—to find as many treasures as possible while avoiding doing things like falling off cliffs and getting trapped in dungeons. Map as you go. $34.95. *Create Word Puzzles with Your Microcomputer*, on the other hand, is a collection of seventeen Microsoft Basic puzzle programs designed to handle large alphabetic databases formed from user-created word and quotation files. Acrostics, cryptograms, word-finds, quote-falls, fall-ins, and all that good stuff, brought to you by master puzzlemeister **Ernest E. Mau.** All programs accompanied by a map of the variables, commands, and functions. $14.95. **Hayden Software,** 600 Suffolk Street, Lowell, MA 01853. **Commodore:** The first catalog for the Vic-20 lists hundreds of programs from American Peripherals, Briley, Comm-Data, JMH of Minnesota, Micro Ed, Microphys, Startech, and United Microware International. Absolutely free from **Queue, Inc.**, 5 Chapel Hill Drive, Fairfield, CT 06432.

Rescue at Rigel has been translated for the Vic-20. Fantasy role-play your way through the universe of *Starfleet Orion* and *Invasion Orion* to save the imprisoned humans from their insectavorid captors, dodging the High Tollah. Real time. 16K expander. $29.95. *Sword of Fargoal*, appearing here for the first time on any computer, lets you amble through random dungeons, meet monsters, and influence ghouls. 16K expander, joystick. $39.95. Both from **Epyx/Automated Simulations,** 1043 Kiel Court, Sunnyvale, CA 94086.
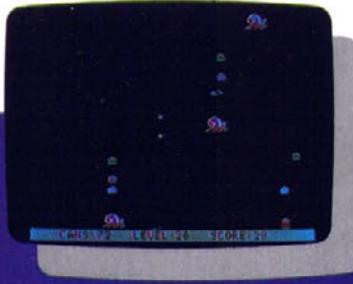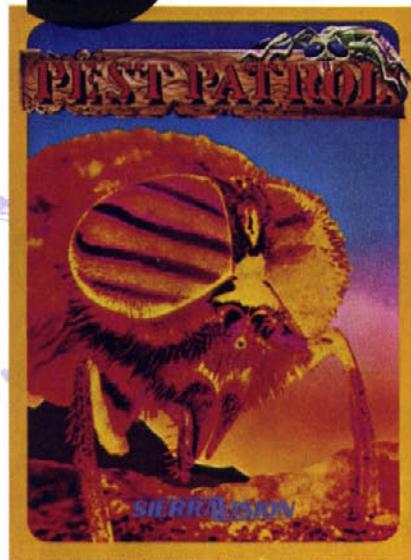
A *Deadly Duck* cartridge is now available for the Vic-20. $34.95. Future adaptations, mostly of original Atari VCS games, will include *Snake Byte, Fast Eddie, Turmoil, Fantastic Voyage, Type Attack, Worm War I, Flash Gordon, Squish 'Em,* and *M*A*S*H.* Promised for the near future are lots of game cartridges and disks for the Commodore 64! All from **Sirius,** 10364 Rockingham Drive, Sacramento, CA 95827.

25

And that's the news. Any (verifiable) informative tidbits from the world of micro gaming that you'd like to share and that we consider sufficiently galvanizing to print will be rewarded with a sum of $25 per item. This does not include announcements of new products (get real!). Send your contributions to Softline Newsmeister, Box 60, North Hollywood, CA 91603. ▪

Vegas Showdown for the Wizards

VERSUS

by Andrew Christie & "Scoop" Yuen
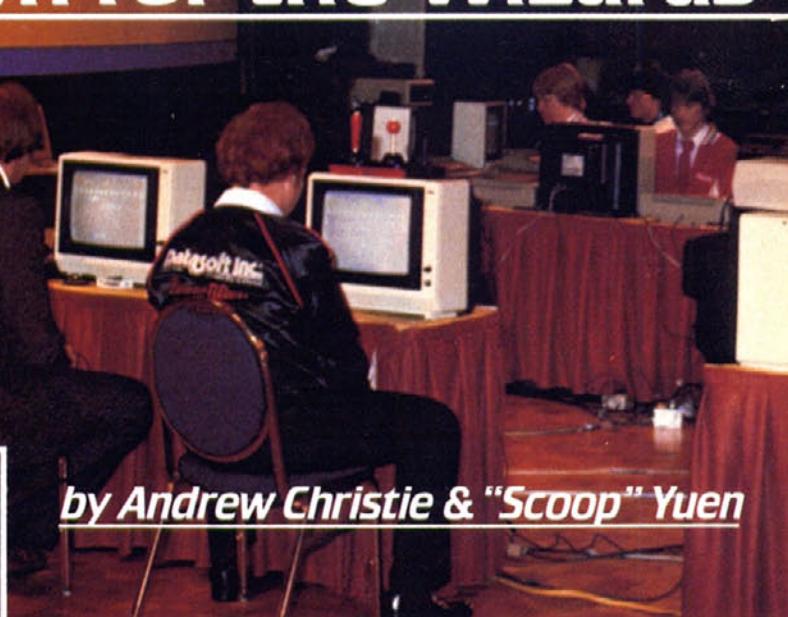
LAS VEGAS, December 3, 1982—Last stop for the American dream. The slot machine junkies and crap table habitues crowd the casinos day and night, strictly abiding by the law of averages and dedicating their lives, their trust, and their fortunes to the fundamental randomness of the universe.

Here, to the ultimate bastion of the Game of Chance, come twelve brave young men to test each other in open competition in games of skill. Comdex is still going full-blast down the street, but the real action is in the grand ballroom of the Sands Hotel, where the top computer game programmers have been assembled for Software Distributors's first annual Wizard versus the Wizards game championship.

All twelve programmers will enter one of their games apiece—breaking down to seven Atari and five Apple games—playing each one for five minutes. The four top players will then go to four se-

Top: a full house on the playing field. Above: Mark Turmell admires Dan Thompson's playing style.

lected Apple games for the semifinals. The two survivors will then switch back to Atari for the final round of three games selected at random by the scorekeeping DEC Rainbow. Best two out of three wins. Next year, the winning wizard will be back to defend his title against fellow wizards (hence the name).

The rules, the prizes, the sandwiches, and the rest of the contest are the responsibility of Los Angeles based Software Distributors, long a third-party distributor between manufacturers and retailers, primarily for CP/M business software. This contest is their way of letting the marketplace know that they now are also in the microcomputer game business.

Thursday Night

Organized chaos. A television production company is preparing its camera setups. Carpenters are hammering backstage, trying to get the set ready in time. The computer techno people are trying to get along with the television people. ("Last night one of the techies told me they wanted all the sound coming out of the cassette ports; this morning I was asked to change it to the speaker, the way it was.") In one corner, three programmers are breaking the code protection on *Pig Pen* so they'll have enough copies for the competition tomorrow. "Nobody told me I was going to need eleven disks," sighs DataMost veep Sandy Wiviott. The Kraft Co. representative needs a spare game to test joystick firing buttons. An impromptu bull session between the show's promoters and software company representatives has started in the middle of the room—seems some people didn't know about the entry fee for this little shindig until tonight, and it comes as quite a surprise.

This was going to be an Atari contest, but a few days ago Atari backed off from providing the computers. The promoters went out and bought all the 800 machines from local stores; then Apple came through with a dozen computers, and the event became nonpartisan.

Jim Nitchals is ticked off. Formerly Cavalier Computer's prodigal programmer, he has come here to show his commissioned Atari version of a successful Apple game to his current patron and to enter it in competition. It has been rejected as "unfinished." Nitchals says it is finished enough for the agreed payment of $2,000 and a small royalty, enough for him to live on for a month and write a good game; to write a spectacular game he would have needed four months. The patron demurs. Nitchals erases all the disks with

# of Games

the new game on them and enters *Microwave* instead.

Getting their first public showing here are Dan Thompson's *Repton*, Mark Turmell's *Turmoil*, and Bob Flanagan's *Spectre* (gaining the instant nickname "Tron Pac-Man"). As each programmer gets to enter one of his games in competition, selecting a game no one else has had much time to play gives one a certain edge. Consequently these three games are drawing a lot of attention, their proud parents standing by, as the other programmers cram for the big test tomorrow.

Friday Morning

Ken Williams and company rented a plane and flew in from Sierra On-Line. Sirius has the heaviest representation—Jerry Jewell and five programmers and executives, all in personalized red sweatsuits. DataMost somehow manages to enter three programmers in the competition—Jay Zipnick with *Pig Pen*, Peter Filiberti with *Night Raiders*, and Bob Flanagan with the unreleased *Spectre*—one over the stated limit necessary to give the event its full complement of twelve players. Datasoft's team, led by Steve Bjork and Gerry Humphrey, here with *Canyon Climber* and *Clowns and Balloons*, is the most dashingly turned-out, in shiny black "competition team" jackets. Russ Wetmore, representing Adventure International, has come with *Preppie*. Joe Hellesen of Roklan brings his translation of *Wizard of Wor*.

There are none from the mighty House of Broderbund, and they are conspicuous by their absence. Reached by telephone, Gary Carlston reports that the company's senior game programmers, Dan Gorlin and David Snider, are both deeply immersed in the job of squeezing their 48K Apple disks of *Choplifter* and *Serpentine* into 16K Atari cartridges, and simply can't take the time off. Carlston "couldn't justify sending them," but next year is a possibility, if the timing is right.

John Antonchick, Apple's show representative, is impressed. "We got involved because one of the guys from Sirius came to us a couple days ago and said, 'Hey, I've got this dynamite game that runs on an Apple and that's the game I want in competition,' and did we want to get into this? It's amazing they've gotten it together this fast. We were contacted three days ago. We're used to that, of course; in this business, that's normal."

The assistant director calls for make-up. "Do all the contestants have make-up? Any contestants without make-up, over here."

Catherine Mary Stewart of "Days of Our Lives," host of the show, can't seem to get through the intro.

We're here at the Sands Hotel in Las Vegas, where we've gathered together the computer wizards of the world for the first ever personal computer game championships. . . .

Cue cards are hastily written up; she gets it right on take fifteen, and the games begin.

Preliminaries

Clowns and Balloons is the first game. DataMost's Bob Flanagan notes that it's tricky with a motion joystick and would be easier with a potentiometer-type. "There's a lot of glare on the screen; some more than others. The positioning around here could make a difference."

When the whistle blows at the end of five minutes, Flanagan comes in eleventh. The rest of DataMost's team, Peter Filiberti and Jay Zipnick, are eighth and tenth, respectively. (Russ Wetmore of Adventure International mistakenly thinks the whistle is a thirty-second warning and keeps playing.)

"Jay's not in the top five but he will be next time, I'm pretty sure of that," says DataMost team coach Dwayne Von Hoozer. "He's up there; we're pulling for him." (Tragically, Zipnick is to place in the bottom three scores on virtually every game.)

A joystick controversy arises between rounds. The Atari sticks are taken out and replaced with Wico Command Controllers. Datasoft objects that some of their players prefer the Atari stick; Jerry Jewell of Sirius thinks all the players should be using the Atari stick because they're used to it. The objections are overruled.

At the conclusion of the Atari preliminaries, no one has played with a lot of consistency, but Dan Thompson and Mark Turmell of Sirius have emerged as the early leaders.

Turmell is "surprised" to be doing so well. "I played several of the games before starting, and we've had several of my strong games so far." Turmell, at six-foot-four the tallest player here, acknowledges that height is a factor: "Obviously it's an advantage, because I can look over all the monitors and see the scores; I can see how everybody's playing."

A basketball fan, Turmell cited the sport for his big wins in *Canyon Climber* and *Preppie*. "Leaping ability helps a lot in *Canyon Climber* with the big gorges and stuff like that, but *Preppie* is just short jumps—log to boat, boat to log; anyone can do that; I mean, what do you want?"

Going into *Jawbreaker 2,* Turmell was confident, having brushed his teeth that morning ("twice"). He came in second.

Chris Daly of Software Distributors notes that "about 80 percent of the authors are losing their own games. That surprised us; we were expecting a spread of about sixty-forty." Wetmore disproves the assumption, taking first place on his *Preppie* and giving himself a spot in the semifinals. Sierra On-Line's Ken Williams and Chuck Beuche have their finest hour on *Jawbreaker 2*, but not enough to make the semifinal cut.

The Ataris give way to Apples for the last half of the preliminaries—*Microwave*, *Threshold*, *Spectre*, *Repton*, and *Pig Pen*. Thompson and Turmell now lock up the top spots for Sirius all the way through. Jim Nitchals, regularly if unspectacularly scoring third or fourth place on all twelve games, is tapped to go up against Thompson and Turmell, along with Wetmore.

Semifinals

The four players are to play against each other in teams of two. The assistant director offers to toss a coin for them to see who goes first in the semifinals, but can't decide if the coin should be tossed on-camera. There ensues a brief flurry of "after you; no, after you." "Just toss it!" yells the helpful camera crew.

A furry green robot on a tricycle propositions Catherine Mary Stewart between takes. Jim Nitchals, a soap opera fan, gets her autograph.

Ataris out, Apples in. *Threshold*, *Spectre*, and *Pig Pen* have been selected to perform the final weeding-out. Nitchals (a top-seeded favorite) finally makes his move, taking second place in all three games. His overall scoring consistency in the preliminary rounds wins

out over Turmell's brilliant but erratic play, and he goes to the finals with Dan Thompson.

·· The press closes in for last-chance interviews while the ultimate competition is being prepared. Due to the pre-game events in which he was embroiled, Nitchals claims he had a lot on his mind, disrupting his concentration. Dan Thompson is modest, admitting he had been "a little nervous." Coach Jerry Jewell calls his top player "a natural." That seemed to be so, Dan agreed; "That was the second time in my life I ever played *Preppie*" (in which he placed second).

Thompson has a strict training regimen, "staying up until three in the morning drinking a lot of Coke." Nitchals trains alone, getting in

Press conference: Chris Daly opens the show and announces the rules as Jim Nitchals and Dan Thompson (right) look on.

contest is pretty much over when Nitchals, after clearing the first two screens on *Canyon Climber*, loses his remaining two men in rapid succession. Thompson keeps playing until the whistle blows, reaching the next level of play. The same scenario is repeated on *Wizard of Wor*, and it's all over.

Both contestants receive an Amdek monitor, Wico, Kraft, and TG joysticks, and $500 cash from Software Distributors while the cameras roll. The winner's total take will include a DEC Rainbow and an Atari 800 with disk drive, and will have a value of $20,000.

In the Locker Room

Steve Bjork, a Datasoft in-house programmer, feels the event was "fantastic for getting us press coverage, and it helped to lay the groundwork for future events," identifying where the problems are in staging such bashes and how to avoid them in the future. For next year, "We'll definitely be there if we're invited."

Dwayne Van Hoozer of DataMost agrees that the publicity is invaluable, and also wants to be included in future competitions, setting aside funds and bringing their own in-house cheerleaders—"genuine Valley Girls from Chatsworth, Northridge, and [the really good part of] Encino."

"I figured on winning," says a rueful Jim Nitchals, "but I hadn't figured on Sirius's secret weapon."
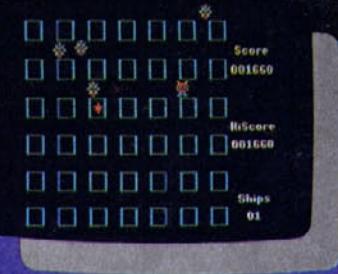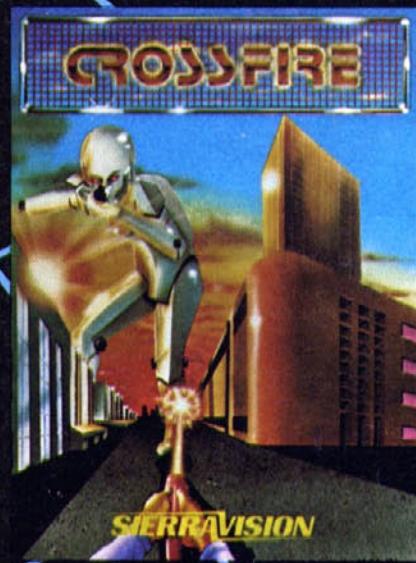
What will his strategy be for next year's contest? "I'm gonna have to write two or three best-selling games, get my friends to do likewise, and have them out on the market a couple of weeks before the event so we'll have enough time for play testing."

"Sometime around next September I'll have to start writing an even more killer game," drawls Dan Thompson, shamelessly plugging *Repton*, "and it'll be just in time for this contest."

See Jim Nitchals's high score on *Repton*, this issue. Revenge is sweet.   **SL**

"Oh well. . . ." Chuckles takes things in stride (left), while Steve Bjork prepares to climb a canyon.

"lots of late-night arcade game playing . . . but I played the wrong games."

Just how intense is the competition at this meet? What about rumors that Thompson had tried to cancel Nitchals's hotel room reservation? "My attorneys advise me not to comment on the situation at this time," says Nitchals. And about rumors that Nitchals had tried to cancel Thompson's plane ticket: "The airline people were very uncooperative."

Last Heat

Apples out, Ataris back; just two machines. *Clowns and Balloons*, *Canyon Climber*, and *Wizard of Wor*, for the best two out of three, will tell the tale. Despite some close playing on *Clowns*, the

Can you beat the pros? Time yourself (five minute rounds; no starting over) to see how you do against the best games of the top five game player/authors.

How they played in the Atari preliminaries. Though authors indeed did not tend to win at their own games, they usually placed in the top five. Exceptions: Gerry Humphrey and Joe Hellesen.

Clowns and Balloons		Night Raider	
Turmell	24,820	Flanagan	16,462
Wetmore	23,100	Filiberti	13,517
Thompson	21,560	Williams	12,961
Nitchals	16,310	Nitchals	10,408
Bjork	14,120	Turmell	8,867

Canyon Climber		Wizard of Wor		Preppie		Jawbreaker 2		Turmoil	
Turmell	33,200	Thompson	42,800	Wetmore	11,550	Beuche	28,070	Thompson	54,260
Thompson	28,400	Humphrey	37,700	Thompson	9,690	Turmell	17,570	Turmell	50,830
Hellesen	23,200	Filiberti	31,000	Filiberti	9,540	Williams	15,795	Wetmore	39,540
Bjork	22,600	Wetmore	30,500	Nitchals	9,490	Nitchals	13,560	Nitchals	34,240
Flanagan	18,200	Williams	25,500	Bjork	8,390	Hellesen	9,980	Filiberti	29,950

The Apple prelims. Genre was plainly more of a factor than machine. Nitchals's strongest playing was in the maze games, both Apple and Atari. Flanagan's score on *Spectre* could be predicted from the fact of his authorship and his having had the most practice with it.

Microwave		Threshold		Spectre		Repton		Pig Pen	
Nitchals	6,084	Thompson	49,700	Flanagan	10,030	Thompson	21,695	Nitchals	24,310
Wetmore	4,327	Turmell	43,800	Thompson	8,360	Turmell	12,556	Flanagan	22,830
Thompson	3,475	Wetmore	39,800	Turmell	3,400	Wetmore	11,330	Thompson	19,130
Zipnick	2,196	Filiberti	35,000	Nitchals	2,810	Filiberti	7,530	Turmell	18,440
Hellesen	1,158	Nitchals	29,900	Beuche	2,370	Bjork	6,575	Beuche	16,230

Game/Publisher	Score	Player
Action Quest, JV Software	20/94	Terry Rora, Roanoke, IL
Alien Ambush, Peter Fokos	84,600	Derin Basden, Fresno, CA
Alien Defense, Soft Sector Marketing	175,350	Chris Athanas, Topsham, ME
Alien Descent (TRS-80)	164,350	Chris Athanas, Topsham, ME
Alien Swarm, In-Home	*92,470	Steve Halberstadt, Newark, DE
Alien Typhoon, Broderbund	*886,480	Clark Alyea, Bloomington, IN
Andromeda, Gebelli	118,000	Joey Grisaffi, Houston, TX
Apple Panic (Atari), Broderbund	*285,310	Gayle Hoskin, Hollywood, FL
Asteroids, Atari	*2,579,840	Michael O'Shaughnessy, El Segundo, CA
Attack Force, Big Five	34,740	Chris Athanas, Topsham, ME
Autobahn, Sirius	*2,183 Miles	Patrick Moran, Amherst, NY
Avalanche, Atari	*1,812	Brian Hall, Milford, MI
Aztec, DataMost	Level 4/*704,306	Curtis Rau, Woodside, CA
Bandits, Sirius	*414,330	Michael Cranford, Corona Del Mar, CA
Battlesight, Versa	*75,000	Robert Gazis, Queens, NY
Beer Run, Sirius	*12,152	Robert L. Skell, East Wenatchee, WA
Bell Hop, Hayden	47.86	Buell Hollister IV, Shelburne, VT
≷∂≷℞≤⅗, Southwestern Data	25,490	Steve George, Hopkins, MN
Bezman, Bez	*227,873	Harry Ilg, Chesterfield, MO
Blister Ball, Creative Computing	(1 player) *975	Bruce Mah, Fresno, CA
Borg, Sirius	*18,960	Matt Sesow, Lincoln, NE
Bug Attack (Atari), Cavalier	*42,926	Chris Conway, Winnetka, CA
Cannonball Blitz, Sierra On-Line	*1,390,120	Bill Shean, Hinsdale, IL
Canyon Climber (Apple), Datasoft	*58,200	Robert and Steven Gazis, Queens, NY
Canyon Climber (Atari), Datasoft	92,800	Terry Rora, Roanoke, IL
Caverns of Mars, Atari	*796,900	Tak Szeto, Boston, MA
Ceiling Zero, Turnkey	*71,490	Denise Achram, Canton, MI
Centipede, Atari	*2,000,210	Eric Lauritzen, Chatsworth, CA
Chicken (Atari), Synapse	*24,810	David Rogers, Chagrin Falls, OH
Chipout, California Pacific	*21,630	Jason Meggs, Bethesda, MD
Chomper, MMG	*29,100	Ed Mixon, Ypsilanti, MI
Clowns and Balloons (Atari), Datasoft	*281,820	Dave Albert, Aurora, IL
Congo, Sentient	*27,154	Mark McKeown, San Jose, CA
Cosmo Mission, Astar Int'l	*7,890	Matt Skinner, Foster City, CA
County Fair, DataMost	*2,394	Nancy McCoy, Poway, CA
Crazy Mazey, DataMost	*59,300	Buell Hollister IV, Shelburne, VT
Crisis Mountain, Synergistic	85,544	Mort Goodman, Orange, CA
Crossfire (Apple), Sierra On-Line	*1,120,310	Brian Condon, Marietta, GA
Crossfire (Atari), Sierra On-Line	*2,000,770	John A. Shaw, Fresno, CA
Crossfire (IBM), Sierra On-Line	*56,840	Craig Stinson, North Hollywood, CA
Crush, Crumble, and Chomp, Epyx	*10,684	Mark Botner and Chris Fleming, Little Rock, AR
Cyclod (Apple), Sirius	*294,320	Ed Housey, Menomonee Falls, WI
Cyclod (Atari), Sirius	275,715	Chris Conway, Winnetka, CA
Cytron Masters, Strategic Simulations	Level 3/*16,480	Arthur Kimes, Los Angeles, CA
Dark Forest, Sirius	*16,364	Allen Holland, Downey, CA
Datestones of Ryn, Epyx	*5,530	Eric Vesper, Saint Louis, MO
David's Midnight Magic, Broderbund	*2,803,110	Brian Whitworth, Meriden, CT
Defense Command, Big Five	*103,330	Ken Caveney, Salinas, CA
Deluxe Invaders, Roklan	*23,750	Bobby May, New York, NY
Dodge Racer, Synapse	*5,350	Ed Mixon, Ypsilanti, MI
Dragon's Eye, Epyx	5,225	James Sylvester, Yorba Linda, CA
Eliminator, Adventure Int'l	*478,900	Mark Klemczak, San Jose, CA
Epoch, Sirius	*999,999	Bill Fletcher, Thousand Oaks, CA
Escape, Muse	*245,400	Dan Steele, Dubuque, IA
Escape from Arcturus, Synergistic	*5,735	Steve Rothenberg, Mayfield Heights, OH
Falcons, Piccadilly	*275,620	David Foster, Delanson, NY
Firebug, Muse	*9,400	David Hussong, Palmdale, CA
Flight Simulator, SubLogic	*60	King Barnes, Houston, TX
Fly Wars, Sirius	*5,020	Bill Cheng, River Vale, NJ
Frazzle, Muse	*7,600	Bill Lipa, Woodside, CA
Free Fall, Sirius	4,010	Paul Sabin, Waban, MA
Frogger (Atari), Sierra On-Line	*176,665	Robert Rendahl, Torrance, CA
Galactic Attack, Sir-tech	*1,285	Craig Morris, Menlo Park, CA
Galactic Chase, Prism	40,000	King Mon Yee, Boston, MA
Galaxy Gates, Magnasoft	11,530	Joey Grisaffi, Houston, TX
Galaxy Invasion, Big Five	225,420	Chris Athanas, Topsham, ME
Galaxy Travel, Tokumo	*51,320	Randy Hayes, Yuba City, CA

HIGH SCORES

Highlines

Let's take up some complaints and queries, starting with a common one voiced by **Steve George:** "I can't keep up with the changing scores and changing rules (verification) and which games are still in the running and which games are the same as a game with another name, et cetera. . . ."

And from **Mark Adams:** "Do you consider the way I reached my high score on *Gobbler* cheating? If so, I'm glad you took it out. Also, you have taken many games out because there are ways to cheat. Why don't you tell us how they did it so we can get high (but fake) scores on some of our favorite games? In the November issue you decided to take out the longest lasting high scores. Are these scores up for grabs or permanently closed? Another thing: there was a lot of talk about a thing called *Cropduster.* What exactly is it? A game? A joke? Did I miss something?"

To take your questions in order, Mark: 1) No, but *Gobbler* has been litigated out of existence, making competition difficult; 2) forget it; 3) provisionally closed, unless you want to send in your score and it's higher than the retired score; 4) yes.

In the fast-moving world of microcomputer technology, we all must grow and learn new things together. Think of it as an evolutionary process, with old games battling for survival, adapting to existing market conditions, and eventually dying and sinking to the bottom to form a layer of petroleum sludge. Try this: most games have a copyright notice on their title page. If it says 1980 or earlier, you probably won't find it in these pages, with the exception of genuine classics. Brand-new turkeys don't last long, either. You see, things are actually quite logical and orderly when you get down to it.

Alex Rosenberg wishes to dispute our statement that *Nightcrawler* and *Photar* are the same game, because, "*Photar* has faster moving enemies that, when contacting a mushroom, warp to another. *Nightcrawler* is a direct copy of *Centipede.*" It certainly is, Alex, which is why Softape had to rework it and release it as *Photar,* soothing the rights holders of *Centipede* so they would stop rattling their subpoenas. *Nightcrawler* was never legally available for sale. Where'd you get yours, hmm?

"How," asks **David Brown,** "did **Ron Bunch** get 1,000,000 on *Cannonball Blitz* when I can find no way to get through the third level?" David would also like to dispute **Al Tommervik**'s high on *Guardian,* "because even if you go through three waves (practically impossible) you would only have a final score of 5,760. How did you do it, Al?" Our illustrious publisher (Mr. Tommervik to you, David) reports that you will not get the high score on *Guardian* by playing to win. The trick is to preserve all your men until the sixth

Game/Publisher Score Player

Game/Publisher	Score	Player
Galaxy Wars, Broderbund	*53,700	Brian Donnelly, Ipswich, MA
Gamma Goblins, Sirius	*18.160	Bob Farr, Trenton, NJ
Genetic Drift, Broderbund	*1,020,000	Tom Bredehoft, Columbus, OH
Ghost Encounter, JV Software	*20/90	Timothy J. Pawlik, Centerline, MI
Ghost Hunter, Arcades Plus	*98,000	Jomo Starke, Pasadena, CA
Gold Rush, Sentient	*2,136,000	Lee Stafford, Phoenix, AZ
Golden Mountain, Broderbund	2,202,400	Scott Sanchez, San Juan Capistrano, CA
Gorgon, Sirius	*68,920	Clark Alyea, Bloomington, IN
Guadalcanal Campaign, Strategic Simulations	*2,015	Arthur Kimes, Los Angeles, CA
Guardian, Continental	*16,660	Al Tommervik, North Hollywood, CA
Hadron, Sirius	*604,765	Greg Bartlett, Phoenix, AZ
High Orbit, Gebelli	11,730	Dean Zevchek, Parma, OH
Horizon V, Gebelli	*58,405	Jim Stockla, Shelton, CT
Human Fly, CPU	*150	Buell Hollister IV, Shelburne, VT
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	3,633	Randy Dellinger, Fort Belvoir, VA
Invasion Force, Computhings	15,820	Jon Hickey, Narragausett, RI
Jawbreaker I (Apple), Sierra On-Line	280,615	Horace Gower, Freeport, ME
Jawbreaker II (Apple), Sierra On-Line	*162,260	Mary Sue Rennells, North Hollywood, CA
Jawbreaker (Atari), Sierra On-Line	*113,250	Jon Mellott, Fort Wayne, IN
Jellyfish, Sirius	*290,000	Eric Vesper, Saint Louis, MO
Juggler, IDSI	779,980	John Osborn, Menlo Park, CA
K-Razy Shoot-Out, K-Byte	35,270	Daniel Rosman, Seattle, WA
Kamikaze, Hayden	*4,560	Jason Meggs, Bethesda, MD
Kayos, Computer Magic	*51,460	Randy Feldman, Brooklyn Park, MN
Kid Grid, Tronix	*7,940	Jim Burkhard, Boonton, NJ
Labyrinth, Broderbund	*89,470	Elson Valle, San Carlos, CA
Laf Pak: Apple Zap, Sierra On-Line	*44,025	David Duplantis, Bloomington, IN
Laf Pak: Creepy Corridors, Sierra On-Line	*5,450	Judson McClendon, Birmingham, AL
Laf Pak: Mine Sweep, Sierra On-Line	6,081	Sharron Keck, La Palma, CA
Laf Pak: Space Race, Sierra On-Line	*10,400	Buell Hollister IV, Shelburne, VT
Laser Maze, Avant-Garde	*15,675	Cary Feldman, Sioux Falls, SD
Lazer Silk, Gebelli	*58,250	Brian Kandell, Cincinnati, OH
Lemmings, Sirius	*143,435	Jerry Ingram, Drayton Plains, MI
Lunar Leeper, Sierra On-Line	*63,320	Christian Juhring, Carmel, CA
Marauder, Sierra On-Line	*263,000	Jim Densmore, Los Angeles, CA
Mars Cars, DataMost	*42,940	Roe R. Adams III, Hyde Park, MA
Mar Tesoro, Synchro	149,561,409	Michael Prater, Glendale, CA
Match Racers, Gebelli	4,692.3 Miles	Bill Hoscheit, Saint Charles, IL
Meteor Mission Two, Big Five	*65,480	Ken Caveney, Salinas, CA
Microwave, Cavalier	*25,609	Christian Juhring, Carmel, CA
Missile Attack, Adventure Int'l	32,580	Chris Athanas, Topsham, ME
Missile Command, Atari	2,235,000	Jon Mellott, Fort Wayne, IN
Missile Defense, Sierra On-Line	429,000	Bruce Schlickbernd, Westminster, CA
Money Muncher, DataMost	506	Buell Hollister IV, Shelburne, VT
Monster Mash, Software Farm	*2,888	Klaus Liebold, Poway, CA
Morloc's Tower, Epyx	*29,253	John Coffee, Grand Rapids, MI
Mouskattack (Apple), Sierra On-Line	*89,100	Mark Zeitler, Boca Raton, FL
Mouskattack (Atari), Sierra On-Line	240,100	Jeff Connor, Hingham, MA
Nautilus, Synapse	(1 player) 73,400	Joey Grisaffi, Houston, TX
Nautilus, Synapse	(2 player) 221,440	Sean Kelly and Jeff Chu, Westminster, CO
Neptune, Gebelli	*13,040	Buell Hollister IV, Shelburne, VT
Nightmare Gallery, Synergistic	*202,325	Clark Alyea, Bloomington, IN
Night Mission Pinball, SubLogic	*481,669,040	George De La Mater, Traverse City, MI
Odyssey, Synergistic	*451,950	Matt and Aric Rosenbaum, Montville, NJ
Pac-Man, Atari	422,860	King Mon Yee, Boston, MA
Pathfinder, Gebelli	*25,254,326	Brian Hall, Milford, MI
Peeping Tom, Micro Lab	*12,360	Jason Meggs, Bethesda, MD
Pegasus II, Sierra On-Line	*238,460	Brandon Stone, Webster, NY
Penetrator, Beam	10,370	Chris Athanas, Topsham, ME
Pest Patrol, Sierra On-Line	*Level 29/2,972	Arthur Patryk, Del Mar, CA
Photar, Softape	*107,004	Todd Yamada, Seattle, WA
Picnic Paranoia, Synapse	77,960	Terry Rora, Roanoke, IL
Pie Man, Penguin	*56	Bruce Broussard, Houston, TX
Pig Pen, DataMost	*344,640	Buell Hollister IV, Shelburne, VT

and highest scoring level, then go for the high score, losing all your men, rather than trying to get through the game.

Sad news: we can accept no more *Serpentine* scores. There just aren't very many ways *not* to cheat with this baby. Take heed, oh you foolish programmers; you who would beta test and then leave in the test control keys. A score is a terrible thing to waste.

Happily, we *will* be accepting *Jawbreaker 2* scores. Everything's okay now.

The *Caverns of Mars* Story, Chapter XII. In this month's episode, **A. J. Benway** admits that his maximum high score calculation was "a bit off" and that **Eric Blumthal**'s 325,500 is possible, but **Michael O'Shaughnessy**'s shift-control method doesn't work on his game, so **Tak Szeto**'s score should still be removed because not everyone can get an infinitely scoring game. Krystle tells Blake she's leaving him.

Thomas Summerall settles **Terry Toolin**'s hash, declaring that any changes in the timing incurred by turning the sound off in games that feature this option are quite all right, as, "Any player using one of these games is free to turn the sound off or on, whichever he or she finds easier. Because this feature can be used in this way, it doesn't matter that it might change the timing." That's the American way. But **Warner Young** would still like to know how to turn the sound off in Atari *Crossfire*.

Thomas also submitted a score for *Marauder* with an air of weary fatalism, "in the knowledge that by the time you receive it, either someone will have beaten my score or the deadline will have passed. So it goes." Well, okay, someone beat your score and the deadline passed, but hey: **Steven D. Jons** got his 174,970 in *Seafox* at 4:00 p.m. on the deadline day, got it verified even though, "Everyone had left the house but Mom," and it now resides on the roll of the honored. It's all in the attitude. Note also that we have moved the deadline up half an hour.

No, **Steven Gazis**, your 505 in *Pie Man* after it "sort of bombed after 60 and the obstacles didn't disappear, the treadmill slowed to a crawl, and the pies were invisible half the time" was not the result of your being "too good for it." Find yourself a good disk and settle down.

Zork-master **Jeff S. Connor** had to stay home sick while his folks went to his grandmother's for Thanksgiving, but he "saw the high score for *Mouskattack* and went for it." Jeff left his Atari on as long as he could "but it was burning up." Job well done. Both of you get some rest.

You, too, **Holly Ann Jones**. Your mom reports that *Pac-Man* leaves you a sweaty-palmed nervous wreck, and she sent in your high just so you'd let her change the cartridge in the computer and erase your score. Mellow out, kid. Play *Caverns of Mars*.

And a speedy recovery to **Alaine Goluba**, who cut herself with a pencil verifying brother **Todd**'s *Viper* score and bled on the paper. Gross.

Edward N. Gooding, Sr., writes to inform us that he beat last issue's high score for *Cyclod* at 2:00 a.m. on December fourth, using an Apple III in emulation, "and reached level 19 before my third eyeball was bitten." Super gross.

Rod Nelsen, author of *Cricketeer*, reports a score of 191,110 on *Space Spikes*, an unreleased DataMost game. Hey, like, that's really fair, Rod. We'll just mention it here so everyone else can know what to beat when it actually comes out. But this should make you happy: **George Engel**'s wife **Arlene** just called him at work and said she scored 10,740 on *Cricketeer*, was "very enthused about it," and considers it better than *Frogger*.

Andy Moore writes to tell us that he lives in Maryland. "You all said that I lived in Florida. *Wrong*! (My friends really got me bad for your error.)" Well, *excuse* us. Not only do you move around too much, your *Microwave* score is too low. Chee.

Michael Yang would like to say that he lives in Williamsville, New York, not Parma, Ohio. Somebody called us to report a high score of 2,443 on

Swashbuckler, but we can't get his city and state wrong because we wisely forgot to write down his name. Fooled you that time.

Mr. Yang also takes exception with **Ron Bunch**'s 1,000,000 on *Cannonball Blitz*—"an even number (pretty suspicious). I have determined that the fastest way to get a high score would be to jump cannonballs forever. Each jump is worth 200 points and the soldier releases a cannonball every 3.5 seconds. Therefore, the fastest way to get a score of 1,000,000 would be to jump 5,000 cannonballs, and that would take 3.5 seconds times 5,000 = 175,000 minutes, or 4.86 hours. How someone could do this for that long a period of time without getting accidentally killed is beyond me."

A little off the subject: **Tim Huang** sent his 1981 first and second semester geometry class evaluations along with his request for a free copy of "The Amazing 3-D Maze." Though we can't say for sure without seeing a complete transcript from J. Sterling Norton High, anyone who could take their first semester test final grade from an A to an A+ in the second term is obviously a model student. This is the kind of initiative and competitive spirit we like to see in our readership. Keep it up, Tim, and let us know how you do in math analysis and quantum physics.

Into the sinister. **Steve Dikkers**, denied his *Galaxian* high score because it had already been beaten as *Alien Rain*, plotted against us. "It should be no problem to doctor the screens to produce about any score I want! I will make *Softline* yet! . . . But then I think, 'If I can do it, everybody must be doing it!' Upon reading your sheet, I detect that apparently everybody *is* doing it! As far as written verification goes, I can think of any number of people who would put their name on the line for a twelve-pack. Will a signature work any better than a photo or a screen dump?"

What is the real truth of human nature, Steve? What can we say about the strength of faith that can move mountains, and the need to perform an act of real meaning; to rise above the misery of the human condition to do something fine and ennobling? What stopped you from sending in your fake screen dump as you originally planned, Steve, instead alerting us to your intent and confessing to the act you had contemplated? Do you yourself know? Do you know that you cannot be tempted to a degree greater than your ability to resist temptation? In the wake of November's purge, the general tenor of score submissions has been more impassioned, somehow; vibrant; as though imbued with a special life and purpose; sure in the knowledge that to truly achieve this high score is to do that which is right, and, in the sureness of that right, to prevail.

That's what we believe. And we're willing to back those warm feelings with cold cash. See our No Contest page.

And if that's not enough: should you knowingly sign your name to someone's false score, and that score is published in a magazine that is sent through the U.S. mails, you open yourself up to all kinds of potentially sticky situations, should our high-powered lawyers or the Postmaster General really decide to make things hot for you. Fraud, aiding and abetting, malice aforethought . . . real potential here.

Anyway, we ain't too worried.

Shane Rolin writes to attempt a correction of his scores by removing the final zeros.

You don't say?

Come back, Shane!

Disputed:

Epoch: B. Elvey challenging B. Fletcher over *ten-increment scoring.*
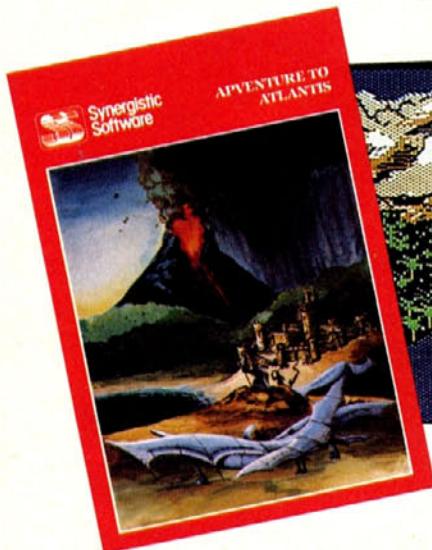
Centipede: T. Rora challenging E. Lauritzen over *easy version.*

Cannonball Blitz: M. Yang challenging R. Bunch over *too-high score.*

SL

Game/Publisher   Score   Player

Game/Publisher	Score	Player
Planetoids, Adventure Int'l	584,160	Jason Meggs, Rochester, NY
Pulsar II, Sirius	*61,968	Eric Vesper, Saint Louis, MO
Quadrant 6112, Sensible	*86,950	Eleni Haack, Upland, CA
Raster Blaster (Atari), BudgeCo	*1,285,900	David T. A. Taylor, Chandler, AZ
Rear Guard (Apple), Adventure Int'l	*267,850	Matt Yuen, Van Nuys, CA
Rear Guard (Atari), Adventure Int'l	77,530	Joey Grisaffi, Houston, TX
Repton, Sirius	599,515	Jim Nitchals, San Diego, CA
Rescue at Rigel (Apple), Epyx	1,322	Bruce Schlickbernd, Westminster, CA
Roach Hotel, Micro Lab	*12,350	Mike Post, Huntington Beach, CA
Robot Attack, Big Five	14,050	Jordan Firfer, Skokie, IL
Rocket Command, Norell	*778,070	Paul MacQuiddy, Sunnyvale, CA
Scarfman, Cornsoft	*256,530	Ken Caveney, Salinas, CA
Seafox, Broderbund	*174,970	Steven Jons, Ames, IA
Serpentine, Broderbund	*Level 42/5,120,300	Arthur Kimes, Los Angeles, CA
Shamus, Synapse	*223,080	Jonathan Hopwood, Glastonbury, CT
Sheila, H.A.L. Labs	*155,917	Scott Brown, Riverside, CA
Shooting Arcade, Datasoft	32,000	Ginger Freibrun, Los Angeles, CA
Shooting Gallery (Apple), Western Microdata	*3,495	Steve Rothenberg, Mayfield Heights, OH
Slime, Synapse	Storm 34/227,730	Terry Rora, Roanoke, IL
Snack Attack, DataMost	*22,984	Chris Wysocki, Brookfield Heights, CT
Snake Byte (Apple), Sirius	*623,240	Phillip Gee, San Francisco, CA
Snake Byte (Atari), Sirius	21,330	Chris Conway, Winnetka, CA
Space Ace, London Software	*15,360	Bobby May, New York, NY
Space Adventure, Sierra	*150	Dave Shafadeh, Grosse Pointe, MI
Space Album: Asterisk, California Pacific	*6,242	Jason Meggs, Bethesda, MD
Space Album: Death Star, California Pacific	*1,391	Dave Ness, Saratoga, CA
Space Album: Tail Gunner, California Pacific	*44,898	Charles Campbell, San Jose, CA
Space Eggs, Sirius	53,000	Fred Nisewanger, Fremont, CA
Space Quarks, Broderbund	*31,870	Clark Alyea, Bloomington, IN
Space Raiders, USA	*Galaxy Commander: 240	Bob Elvey, Grand Rapids, MI
Speedway Blast, IDSI	*6,342,146	Tony Yang, San Luis Obispo, CA
Spy's Demise, Penguin	*33,738	Buell Hollister IV, Shelburne, VT
Star Blaster, Piccadilly	*116,537	Doug Mendenhall, Wykoff, NJ
Star Dance, USA	*3,605	Michael Steiner, Killeen, TX
Star Maze, Sir-tech	Level 16/125,625	Roe R. Adams III, Hyde Park, MA
Star Raiders, Atari	*Star Commander Class 1	John Broas, Reedsburg, CA
Star Thief, Cavalier	(1 player) *30,110	Clark Alyea, Bloomington, IN
Star Thief, Cavalier	(2 player) *48,280	Craig Wilson, Madeira, OH
Star Warrior, Epyx	*1,872	Ron Felder, Sunnyvale, CA
Stellar Invaders, Apple	*119,000	Patrick Carle, Dunstable, MA
Suicide, Piccadilly	97,030	Joey Grisaffi, Houston, TX
Super Breakout, Atari	2,870	Randy Dellinger, Fort Belvoir, VA
Super Invader, several publishers	*99,840	Chris Wysocki, Brookfield Center, CT
Super Nova, Big Five	101,110	Chris Athanas, Topsham, ME
Super Taxman II, H.A.L. Labs	*225,490	Scott Brown, Riverside, CA
Swashbuckler, DataMost	*1,589	Alex Stuart, Everett, WA
Taipan, Avalanche	*$12.9 Trillion	Dave Butler, Cudahy, WI
Tanktics, Avalon Hill	*495	David Melendez, Rancho Palos Verdes, CA
Taxman, H.A.L. Labs	*999,980	Eggy Paul, Orange, CA
Teleport, Cavalier	*Level 9/10,035	Arthur Patryk, Del Mar, CA
Tharolian Tunnels, Software Farm	108,100	Rod Nelsen, program author
Thief, DataMost	31,170	Mark Johnson, Glen Ellyn, IL
Threshold (Apple), Sierra On-Line	*733,200	Ramana Dutt, Grand Blanc, MI
Threshold (Atari), Sierra On-Line	*309,500	Ron Felder, Sunnyvale, CA
Track Attack (Apple), Broderbund	*50,419	Buell Hollister IV, Shelburne, VT
Track Attack (Atari), Broderbund	40,497	Chris Conway, Winnetka, CA
Tranquility Base, California Pacific	*1,800	Brian Donnelly, Ipswich, MA
Tubeway, DataMost	38,368	Buell Hollister IV, Shelburne, VT
Tumblebugs (Apple), Datasoft	*11,537	Robert Rendahl, Torrance, CA
Tumblebugs (Atari), Datasoft	*7,035	Robert Goebelbecker, Willowick, OH
Tunnel Terror, Adventure Int'l	*197,536	Mike Mariotti, Houston, TX
Viper, RDA Systems	2,997	Mike Keck, La Palma, CA
Warp Destroyer, Piccadilly	8,200	Dean Zevchek, Parma, OH
Wayout, Sirius	*19	Steven Gazis, Queens, NY
Wizard of Wor, Roklan	*160,300	Lee Hampton, Crofton, MD
Wormwall, Sirius	*120,380	Eric Vesper, Saint Louis, MO
Zenith, Gebelli	*7,600	Bill Cheng, River Vale, NJ
Zero Gravity Pinball, Avant-Garde	17,050	Joey Grisaffi, Houston, TX