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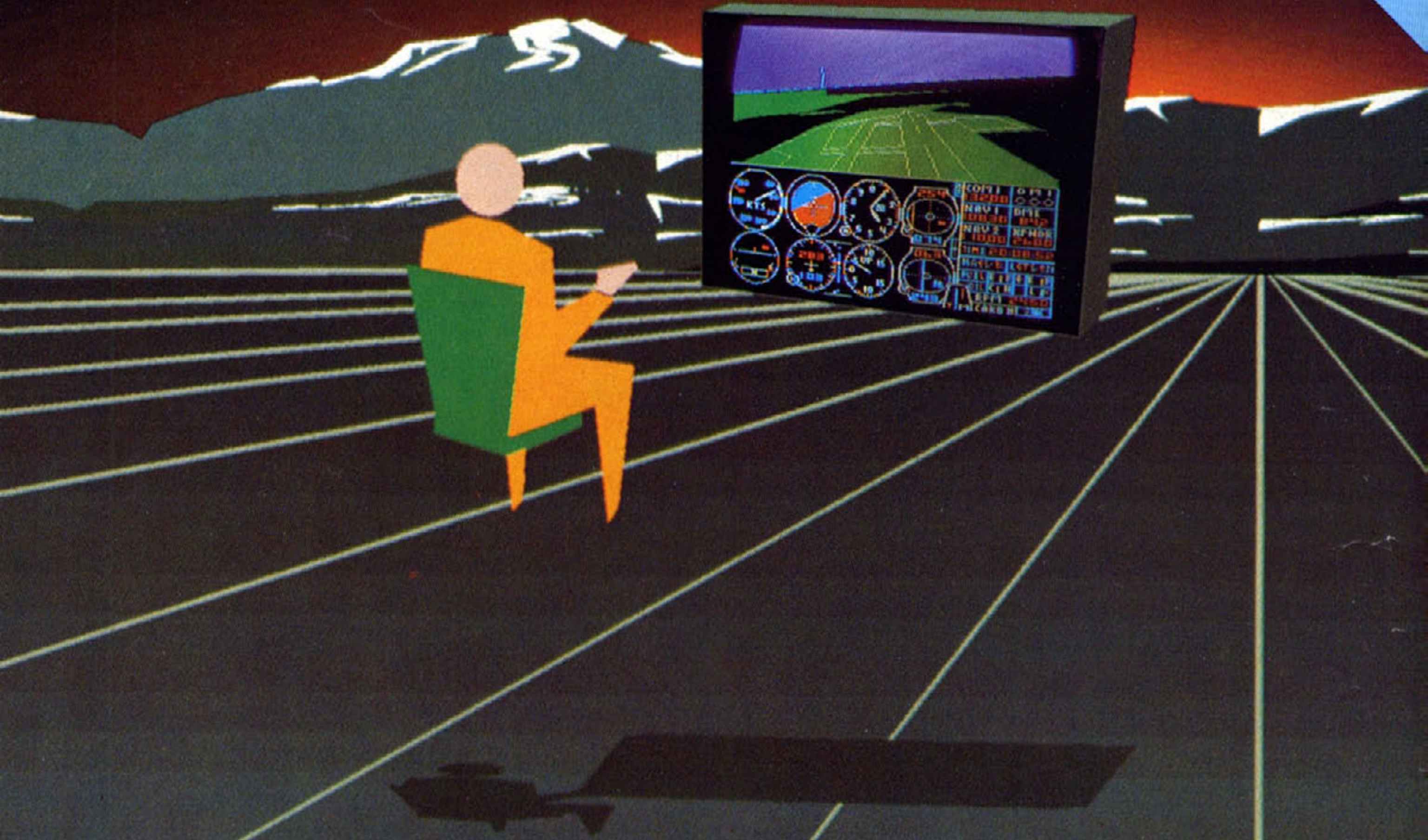

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Editorial Intelligence: Margot Comstock Tommervik, main brain; Carol Ray, central processing unit; Andrew Christie, creative genius; Matt Yuen, information buffer; David Durkee, technically with-it; Tommy Gear, mail sort routine; Cord Cooper, parser; Harry McNeil and Judith Pfeffer, error-checking subroutines; Betsy Barnes, information routing routine; Al Tommervik, slipped disk.

Artfully Intelligent: Trici Venola, left brain; Don Robertson, intelligent traffic director; Nancy Baldwin, Lucas McClure, Ruth Seid, right side of left brain; Michael Pender, ad-tracking device and part-time actor; Weldon O. Lewin, Dan Winkler, artonomic nervous system and loose pencils; Kurt Wahlner, raw nerve.

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GAME LIBRARY

Like a bastion of computer culture before the onslaught of micro mediocrity, a shining beacon of gaming goodness cutting through the murky miasma of just so-so software, the Game Library deals only with the right stuff. It lives to serve. All Recommended programs are the best of the current releases and carry the very highest recommendation. The programs in the Stacks were once worthy enough to be so called and have since graciously stepped aside to make room for new blood. In neither of these categories would you be risking wasting your money. New Releases includes any damn fool thing that meets the single criterion of its category, and the items are largely unseen except where obviously otherwise. Please line up on the left; have your I/O open and your RAM ready.

RECOMMENDED

Beach-Head. Carver. *Commodore 64*. A one- or two-player, joystick-controlled, six-sequence WW II naval engagement, the equivalent of six different (yes, different!) games. Action, sound, design, all tops. Truly fine arcading.

Access Software, 925 East 900 South, Salt Lake City, UT 84105. $34.95.

Dino Eggs. Schroeder. *Adam, Apple, Atari, IBM*. The ultimate in prehistoric wildlife preservation. A dense, ineffable arcading experience that reveals its pleasures gradually and allows the development of myriad individual strategies.

Micro Fun, 2699 Skokie Valley Road, Highland Park, IL 60035. $40.

Drol. Beng. *Apple, Atari, Commodore 64*. Very cute, but not too cute; very hard, but it just makes you try harder. At the moment, it is unquestionably the most graphically delightful, impressively animated arcade action around.

Broderbund, 17 Paul Drive, San Rafael, CA 94903. $34.95.

Sargon III. Spracklen, Spracklen. *Apple*. Manages to play chess both fast and well. Far and away the most powerful chess program for the microcomputer.

Hayden, 600 Suffolk Street, Lowell, MA 01853. $49.95.

NEW ARRIVALS

Fiction

Alpine Encounter. *Apple, Atari, Commodore 64, IBM*. Hi-res, two-sided ski resort mystery with cast of dozens, full-sentence input, and arcade ski sequences. Media Sales, Box 2574, Springfield, MA 01101. $59.95.

Aquatron. Gray. *Apple, Atari*. Air-sea arcade battle in which your multitalented amphibious fighter must duke it out with bombers, escorts, interceptors, power mines, and subs. Sierra On-Line, Sierra On-Line Building, Coarsegold, CA 93614. $29.95.

Ardy. Oberth. *Apple*. Aardvark invades anthill; citizens rally to defense of their home. Ardy's tongue, while of near-infinite length, is vulnerable to a variety of attacks as it negotiates the ant maze. Datamost, 8943 Fullbright Avenue, Chatsworth, CA 91311. $29.95.

Circus. Howarth. *Commodore 64*. You run out of gas in the middle of nowhere . . . but wait, isn't that a circus? Maybe they can direct you to a petrol station. Half a moment, old man, there's something odd about this circus. . . . Imported British graphic adventure. Comm*Data, 320 Summit Avenue, Milford, MI 48042. $27.95.

Crypt of Medea. Britto, Lamb. *Apple*. You're caught in a crypt with no perceptible means of egress. You quickly realize that you are in an unfriendly environment. Hi-res adventure with multiword parser. Sir-tech, 6 Main Street, Ogdensburg, NY 13669. $34.95.

D-Bug. ChildWare. *Atari, Commodore 64*. This is *Tron* for real: game within a game in a computer within a computer. You're playing *Gotcha!* (a real game), when suddenly a bug appears in your D-Bug computer, and you have to wade in there and fix it in one of your secret identities of Moe Dem, Dot Matrix, or M.A.X. Robot. Electronic Arts, 2755 Campus Drive, San Mateo, CA 94403. $40.

Duel. Marykuca. *Commodore 64*. Jousting good fun, home computer style. A solid, satisfactory translation of one of the more unique arcade parlor thrills. Pioneer, 217-620 View Street, Victoria, B.C., Canada. $36.95, Canadian.

Goren Bridge. Goren. *Apple, IBM*. The first true bridge tutorial program; covers hand evaluation, opening bids, responses, and rebids, and provides 100 selected hands for play practice. CBS Software, One Fawcett Place, Greenwich, CT 06836. $79.95.

Gorgon II. Hopcroft. *IBM*. *Defender* comes to the PC. Requires 64K and color/graphics card. Sirius, 10364 Rockingham Drive, Sacramento, CA 95827. $29.95.

The Heist. Livesay, Mooney. *Adam, Apple, Atari, Commodore 64, IBM*. You must swipe every art object in a nine-story building in order to find a stolen microdot. A sixteen-screen, three-level, *Miner*-flavored "animated adventure." Mapping recommended. Micro Fun, 2699 Skokie Valley Road, Highland Park, IL 60035. Atari, Commodore 64, $35. Apple, IBM, $40. Adam, $45.

J-Bird. *Apple*. *Q-Bert* has grown feathers and made some new friends. Orion, Box 2488, Auburn, AL 36831. $36.95.

Locomotion. *Atari*. Train goes zipping around trees as you shoot at the cars and caboose for points and it wends its way down the screen toward you, back and forth, back and forth. . . . Loosely based, as they say, on *Centipede*. Dynacomp, 1427 Monroe Avenue, Rochester, NY 14618. Disk, $23.95; cassette, $19.95.

MegaMania. Cartwright. *Atari*. This lunatic *Space Invaders* scenario is the latest VCS-to-computer translation—this one, they promise, takes advantage of the computer's additional power. Activision, 2350 Bayshore Frontage Road, Mountain View, CA 94043. $34.95.

Neutral Zone. Carver. *Commodore 64*. Gorgeous-looking, detailed, stately space shoot-'em-up. Emphasis definitely not on reflexes. Sound effects, reminiscent of a cosmic bowling alley, are nevertheless impressive. Access Software, 925 East 900 South, Salt Lake City, UT 84105. $34.95.

Perseus and Andromeda. Howarth. *Commodore 64*. You must sally forth to do battle with Medusa and bring back her head, or the king of Seriphos will marry your mom. Graphic adventure, imported from England. Comm*Data, 320 Summit Avenue, Milford, MI 48042. $27.95.

Rescue Squad. Kutcher. *Commodore 64*. Speed through the city traffic to the burning building, catch the people jumping out, then find your way through the building to free those trapped inside. Nicely integrated three-screen, nine-level arcader. Muse, 347 Charles Street, Baltimore, MD 21201. $29.95.

Silicon Warrior. *Atari*. Teleport around a field of computer chips, changing five chips in a row to your color before your opponents succeed in doing the same. Joystick-controlled seven-level strategy game for one to four players. Epyx, 1043 Kiel Court, CA 94089. $39.95.

Solo Flight. Meier. *Atari, Commodore 64*. A sure-enough flight trainer/simulator with full cockpit instrumentation for cross-country navigation among twenty-one airports. Includes mail pilot game. MicroProse, 10606 Beaver Dam Road, Hunt Valley, MD 21030. $34.95.

Star Destroyer. Robbins. *Apple*. Leisurely space dueling. Vector graphics just will not die. Harvest Time, Box 1527, Jacksonville, TX 75766. $39.95.

Starfire and **Fire One**. Exidy. *Atari, Commodore 64*. The classic tie-fighter space battle and submarine/destroyer engagement games, together at last on one disk (or cassette). Epyx, 1043 Kiel Court, CA 94089. $39.95.

Superbunny. Leone. *Apple*. Guide your mild-mannered rabbit across banks of elevators bearing hostile creatures, grab power-carrot on the other side, then go back and beat the stuffings out of them. Datamost, 8943 Fullbright Avenue, Chatsworth, CA 91311. $29.95.

Supercycles. Casson. *Commodore 64*. Maneuver your cycle around a grid, avoiding other cycles and creating little light-walls for them to crash into. The *Tron*-esque packaging is strictly for show. Pioneer, 217-620 View Street, Victoria, B.C., Canada. $31.95, Canadian.

Ten Little Indians. Howarth. *Commodore 64.* The late Major Johnston-Smythe put all his money into gold, then had it cast into some sort of figurine. Ten other figures must be found to locate the prize, hidden somewhere in the Major's rather fatal mansion. Comm*Data, 320 Summit Avenue, Milford, MI 48042. $27.95.

Towering Inferno. Forth. *Commodore 64.* People and hazardous objects fall out of a burning building; catch 'em or dodge 'em. Pioneer, 217-620 View Street, Victoria, B.C., Canada. $34.95, Canadian.

Universe. Carbone, Leslie. *Atari.* Four-disk tactical/strategy game that takes you through the selection, purchase, outfitting, piloting, defense, and economic maintenance of a starship as you go questing in search of the lost hyperspace booster. Has eighty-two pages of instructions and its own bulletin board service. Omnitrend, 8 Huckleberry Lane, West Simsbury, CT 06092. $89.95.

The Wizard of Akyrz. Howarth. *Commodore 64.* The evil wizard has just about had it with being thwarted by one pesky mortal (you) and has concocted a trap from which there is no escape. Graphic adventure from the U.K. Comm*Data, 320 Summit Avenue, Milford, MI 48042. $27.95.

Zombies. Edwards. *Atari, Commodore 64.* Run like mad through seventy-four colorful, oblique-angle, 3-D rooms in search of the seven crowns. Negotiate ladders, stairs, and a legion of the fatal title characters in perpetual attract mode. M.C. Escher dungeon is a wonderful treat. Bram, 18779 Kenlake Place N.E., Seattle, WA 98155. Disk or cassette, $34.95.

Nonfiction

Ask Alice. A tip service. Sets of clues and maps for *Mask of the Sun, Transylvania,* and most of the On-Line classics. Ask Alice, Box 3074, Stony Creek, CT 06437. $5 each.

Digit-Ball. *Apple, IBM.* Calling it a track ball is like calling a Ferrari basic transportation. It replaces a light pen, mouse, touch pad, or touch screen, and can digitally emulate a joystick for compatibility with all existing software. Programmable X/Y functions with software-overridable hardware switches. Three speeds, auto-centering. Available March. Interfirm Systems, 1899 Montford Court, San Jose, CA 95132. $99.95.

Flying Colors. *Apple.* Graphics program allows choice of line width, expanding and contracting shapes, fill, and erase. Dumps to dot-matrix printer. Includes slide show program. Computer Colorworks, 3030 Bridgeway, Sausalito, CA 94965. $39.95.

Home Applications and Games for the Atari Home Computers. Banse. Thirty-one program listings for all Ataris. You get to type in programs like *Ghost Town Vampire Girls* and *44. Magnum Russian Roulette,* but they're outnumbered by *Checkbook Balancer, Heating Loss Cost Analysis,* and the like. Softcover. Little, Brown and Co., 34 Beacon Street, Boston, MA 02106. $14.50.

Magellan Light Pen. *Apple.* Push-button-controlled pen plugs into game port. Includes two programs for graphics creation and incorporating operation into Applesoft programs. Magellan Computer, 4371 East Eighty-second Street, Suite D, Indianapolis, IN 46250. $189.95.

Public Domain Software for the IBM PC. Directory of Basic utilities, assembly language and Pascal games, graphics utilities, and every other imaginable kind of program available from user groups, bulletin boards, and individuals around the country. PC Software Interest Group, 1556 Halford Avenue, Suite 130R, Santa Clara, CA 95051. $3.95.

Tech-Sketch LP-10, LP-15. *Apple, Atari, Commodore 64.* Push-button light pens. Includes Paint-N-Sketch program in cassette, disk, or cartridge. Tech-Sketch, 26 Just Road, Fairfield, NJ 07006. LP-10, $39.95; with Apple interface board, $99.95. LP-15, $119.95.

Reference

Lisa 2.6. *Apple.* The latest incarnation of Lazer's Interactive Symbolic Assembler can assemble code at 20,000 lines per minute and catches syntax addressing mode errors at input, but you'll still have to find it first. Lazerware, 925 Lorna Street, Corona, CA 91720. $79.95.

Pilot II. *Commodore 64.* An enhancement of *Vanilla Pilot;* superset of Pilot language with hi- and lo-res turtle graphics, sprite editor, and access to all color and sound capabilities of the C-64 without peeks or pokes. Tamarack Software, Box 247, Darby, MT 59829. $49.95.

Spritemaster. Carver. *Commodore 64.* Sprite generator and editor for game programming and animation. Automatically appends sprites to your program. Disk or tape. Access Software, 925 East 900 South, Salt Lake City, UT 84105. $34.95.

THE STACKS

Check marks denote games recently translated to other computers.

Fiction

Adventure

The Coveted Mirror. Berns, Thomason. *Apple.* Warm-hearted, well-puzzled, pretty hi-res graphics adventure, interspersed with minigames and a couple of simple arcade-type sequences. Talk to everyone in a medieval village to find missing piece of magic mirror, all on borrowed time. Penguin Software, 830 Fourth Avenue, Geneva, IL 60134. $19.95.

Deadline and **Witness.** Blank, Lebling. *Most computers.* The first Interlogic Mystery, *Deadline* has player as detective search for clues, interrogate suspects, show clues and findings to suspects to get revealing reactions. Complete interaction, real-time. *Witness* does the same, but on an introductory level. All text, but who cares? Infocom, 55 Wheeler Street, Cambridge, MA 02138. $49.95 each.

Enchanter I. Blank, Lebling. *Most computers.* The first of a planned trilogy that will succeed the Zorks. Above-ground exploration of castle and its environs in search of lords of darkness. Enchanters use magic logically to solve puzzles, which are great. A delight to play and read. Infocom, 55 Wheeler Street, Cambridge, MA 02138. $49.95.

Exodus: Ultima III. British. *Apple, Atari.* By far the best in the Ultima (so far) trilogy. Role-playing fantasy with good plot, everything integrated, clues everywhere—and there's a lot more to everywhere than meets the eye. Multiple heroes. Many hours of colorful, animated, solid role-playing fantasy in Lord British's inimitable style. Origin Systems, Box 58009, Houston, TX 77058. Atari, 48K. $54.95.

Infidel. Berlyn. *Most computers.* Infocom's Egyptological adventure: Find pyramid, uncover pyramid, find entrance to pyramid . . . then it gets tough. A November release, kicking off the company's Tales of Adventure series. Infocom, 55 Wheeler Street, Cambridge, MA 02138. $49.95.

Masquerade. Johnson. *Apple.* Illustrated adventure with diabolical puzzles, wonderful graphics in minor plot. But the puzzles are all hard but satisfying. Last one's a dog. Shaggy. Phoenix Software, 64 Lake Zurich Drive, Lake Zurich, IL 60047. $34.95.

Planetfall. Meretzky. *Most computers.* A lighthearted and strongly involving sci-fi text adventure with characters who care. Was Steve Meretzky an adventurer or a writer first? It's hard to tell—that's how rich the text is. Fascinating exploring, good puzzles, well-written text. Infocom, 55 Wheeler Street, Cambridge, MA 02138. $49.95.

Zork I, II, III. Blank, Lebling. *Most computers.* Classic trilogy of incredibly graphic text adventures by the masters of the genre. Pure logic, intelligent rapport, wit. A complete Underground Empire, at your service. *I* and *II* are archetypical; *III* is unique, with highly challenging puzzles. Infocom, 55 Wheeler Street, Cambridge, MA 02138. $39.95 each.

Arcade

✓**Astro Chase.** Herrera. *Atari, Commodore 64.* Flashy style and attention to detail in this new variation on an old theme. The game is standard operating procedure (save Earth, or else), but alien variety, really tremendous graphics, and rich sound push this one past the point of being "just another computer game." Parker Brothers, 50 Dunham Road, Beverly, MA 01915. $36.

Bandits. Ngo, Bertoni. *Apple, VIC-20.* Just about the only differences between this cart and the 48K original are fewer, simpler colors and a limited repeat-shot function. Also, incredibly, the animation is actually smoother at the highest levels. Best arcade action available for this machine. Sirius, 10364 Rockingham Drive, Sacramento, CA 95827. $39.95.

Choplifter. Gorlin. *Apple, Atari, Commodore 64, VIC-20.* The most awarded computer game in history has virtually no variety in repeat play, but it's a grabber nonetheless. Broderbund, 17 Paul Drive, San Rafael, CA 94903. $34.95.

Crossfire. Sullivan. *Apple, Commodore 64, IBM, VIC-20.* There's just one level, but only a masochist would want more; no game is the same. Smoothly programmed classic challenges some of today's bests. Sierra On-Line, Sierra On-Line Building, Coarsegold, CA 93614. $29.95.

Frogger. Harris. *Atari.* Benton: *Commodore 64.* What would any computer be without this classic conversion of the arcade hit? Disk or cartridge, it doesn't matter; both versions do full justice to the original. Sierra On-Line, Sierra On-Line Building, Coarsegold, CA 93614. $34.95. Parker Brothers, 50 Dunham Road, Beverly, MA 01915. $36.

Hard Hat Mack. Abbott, Alexander. *Apple, Commodore 64.* Despite the competition, *Mack* holds its own. Fast and smooth animation coupled with a stiff challenge make up for its three-screen limit. One original concept in the area of nonviolence: You can't kill those who hound you; you can only try to avoid them. Electronic Arts, 2755 Campus Drive, San Mateo, CA 94403. $35.

✓**Lode Runner.** Smith. *Apple, Atari, Commodore 64, IBM.* Here's a game that brings a new meaning to the word *variety.* One hundred fifty levels. If there are any reasons to be addicted to a game, Doug Smith has found them all and included them in this baby. Play the game; cheat if you want; construct your own levels. The Apple never looked so good. Broderbund, 17 Paul Drive, San Rafael, CA 94903. $34.95.

Miner 2049er. Hogue. *Most computers.* The game that even software pirates decided to buy. Ignore the plot; it doesn't make too much sense anyway. Boot it up (or plug it in) and have a ball. Three levels even on the lowest-end machines, ten on the high ones. Bill Hogue broke new ground when this one debuted; it's subsequently become the most translated game in microdom. Big Five, Box 9078-185, Van Nuys, CA 91409. $49.95. Micro Fun, 2699 Skokie Valley Road, Highland Park, IL 60035. $39.95.

Night Mission Pinball. Artwick. *Apple, Commodore 64, IBM.* User-adjustable classic; ten play modes and forty parameters, for your customizing pleasure. Twenty-page manual. SubLogic, 713 Edgebrook Drive, Champaign, IL 61820. Disk or cassette. $29.95.

Shamus: Case 2. Mataga. *Atari.* The movie industry could learn something from this game—a sequel that surpasses the extremely popular original. Shamus is back in the same survival game, facing the Shadow and aquatic mutants. Several dozen screens means you'll have something to do on rainy days. Having crammed the whole program into 24K, William Mataga makes Atari gamers wonder what he could do with a full 48K. Synapse, 5221 Central Avenue, Richmond, CA 94804. $34.95.

Spare Change. Zeller, Zeller. *Apple.* Slapstick comedy in an arcade-type game. Not Broderbund's most timeless work, but thoroughly enjoyable. Whimsical theme and multiple cartoons fill in the gaps. Broderbund Software, 17 Paul Drive, San Rafael, CA 94903. $34.95.

✓**Zaxxon.** Fortier, Garcia. *Apple, Atari, Commodore 64, TRS-80.* Here's one of the best computer adaptations of a coin-op game ever. Extraordinary special effects for a computer game; never has such an impossible effect been simulated so well. Datasoft, 9421 Winnetka Avenue, Chatsworth, CA 91311. Synapse (C-64), 5221 Central Avenue, Richmond, CA 94804. $39.95.

Fantasy

Knight of Diamonds. Greenberg, Woodhead. *Apple.* Second scenario in the *Wizardry* series has more puzzles to solve. Requires strong characters developed in *Proving Grounds.* Sir-tech, 6 Main Street, Ogdensburg, NY 13669. $39.95.

Legacy of Llylgamyn. Greenberg, Woodhead. *Apple.* Topnotch episode of a topnotch game features super atmosphere, neat puzzles, and an eerie transformation of *Wizardry* characters to their own progeny. Sir-tech, 6 Main Street, Ogdensburg, NY 13669. $39.95.

Wizardry: Proving Grounds of the Mad Overlord. Greenberg, Woodhead. *Apple, IBM.* Original of the *Wizardry* series, *Proving Grounds* is essential for creating characters for all other scenarios. Most involving of all role-playing games. *Wizardry* characters are very personal and traverse the dungeon in groups of six, interacting and supporting each other under player's guidance. Sir-tech, 6 Main Street, Ogdensburg, NY 13669. $49.95.

Strategy

Archon. Reiche, Freeman, Westfall. *Atari, Commodore 64.* Arcade games too fast? Strategy games too slow? This Atari masterpiece combines the best of both worlds. As someone who found chess to be boring beyond belief, author Paul Reiche did something about it, along with fantasy game pros Jon Freeman and Anne Westfall. If you want to take an opponent's square, you fight for it—in hi-res. Skilled spell-casters will have the upper hand in this thoroughly enjoyable battle between light and dark forces. Electronic Arts, 2755 Campus Drive, San Mateo, CA 94403. $40.

Geopolitique 1990. Ketchledge. *Apple.* As the chief executive, you call the shots. In the diplomatic first part of this two-phase game, the United States and Soviet Union struggle for economic and political world dominance. In phase two, you play "what if" in a conventional war situation. Seven scenarios ranging from today's global situation to the hypothetical 1990s are yours for the choosing. Strategic Simulations, 883 Stierlin Road, A-200, Mountain View, CA 94043. $39.95.

Gnosis VII. *Apple.* Unique logic game. No graphics, doesn't need 'em. Determine the secret names of seven gods who move between seven towns. Player must make a living, worship, learn skills, earn sanctuary by figuring out which god rules what and which towns that god is currently influencing. Mind-stretching. Program is totally open, with line guide to key routines printed in manual. Magnetic Harvest, Box 255, Hopkins, SC 29061. $19.95.

I.Q. Baseball. *Apple.* Beautifully executed, amusing baseball trivia game. Major and minor league levels—minor is still about the majors but fine for duffers; major league's only for superbuffs. Answering correctly moves players around the diamond—singles, doubles, and triples, depending on difficulty of question. Rain delays and a relief pitcher, too. Davka, 845 North Michigan Avenue, Chicago, IL 60611. $24.95. Supplementary disks by team (American and National leagues and World Series). $14.95.

North Atlantic '86. Grigsby. *Apple.* Be either the Soviet aggressor or the commander of NATO forces in this hypothetical battle. The Soviets have taken control of Germany and Norway and now plan to swallow Great Britain and the North Atlantic. *Possible, realistic,* and *scary* are the words to describe the scenario. The Soviets' attempt to take Iceland and NATO's efforts to keep England supplied make for some interesting parallels between this confrontation and World War II. Strategic Simulations, 883 Stierlin Road, A-200, Mountain View, CA 94043. $59.95.

Pensate. Besnard. *Apple.* Computer-age abstract strategy game is fast moving and fun for those to whom thinking is good entertainment. Penguin Software, 830 Fourth Avenue, Geneva, IL 60134. $19.95.

TAC. Bosson. *Apple, Atari, Commodore 64, IBM.* It stands for Tactical Armor Command. Detail is what sets this strategy game apart from the rest. This is no board game on screen; tanks and turrets actually move and turn! Distinguished by its quick execution of commands (no more fixing sandwiches while the computer deploys forces) and variables so numerous that the game could be played only on a computer. Avalon Hill Microcomputer Games, 4517 Harford Road, Baltimore, MD 21214. $40.

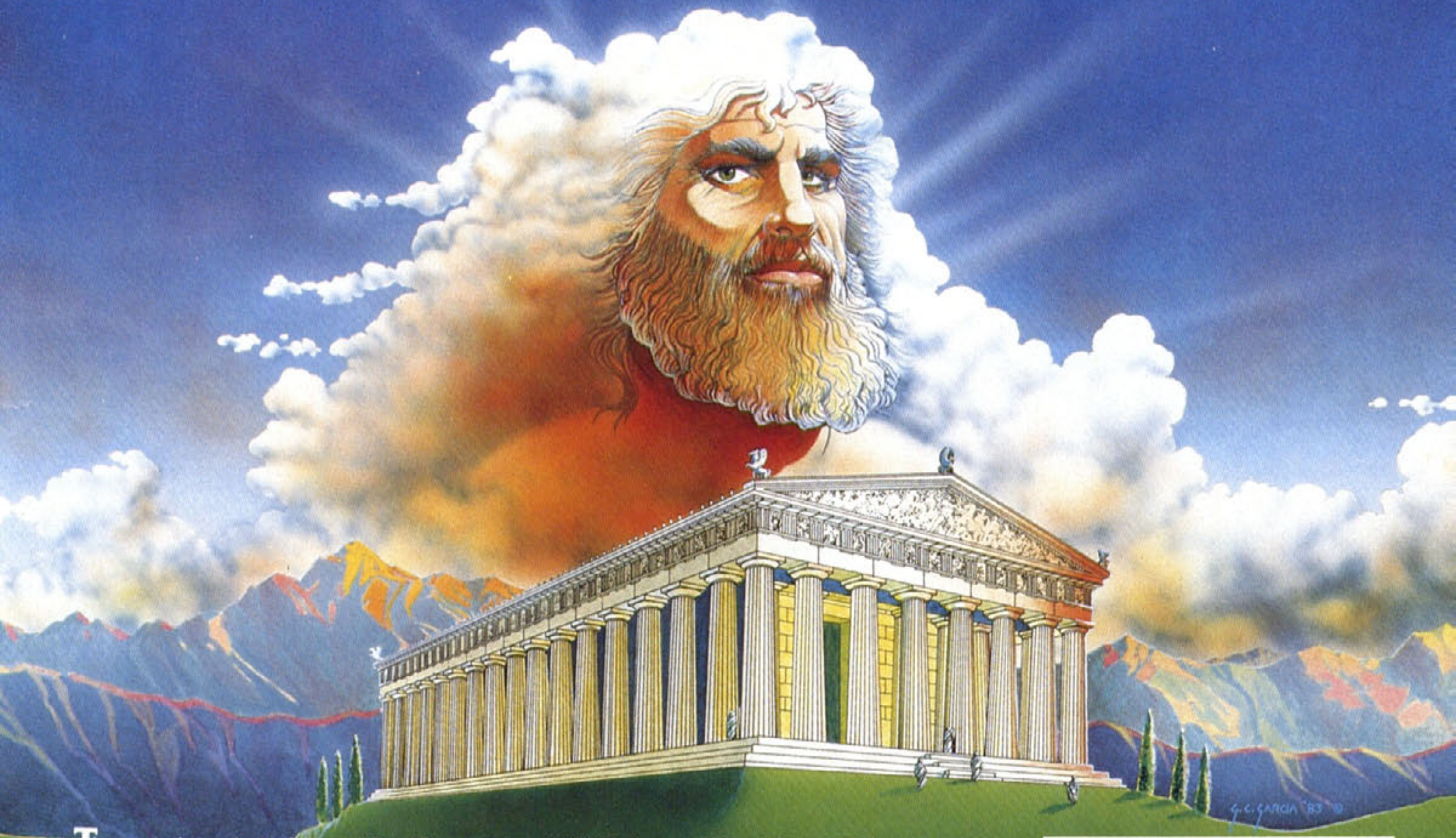
Nonfiction

Music Construction Set. Harvey. *Apple.* In the same vein as its pinball predecessor, this gem puts two-voice music through the Apple's speaker, or up to six voices through Mockingboard-equipped machines. No knowledge of music is required to write, edit, or transpose music. Also lets you use music from within your own programs. Bravo. Electronic Arts, 2755 Campus Drive, San Mateo, CA 94403. $35.

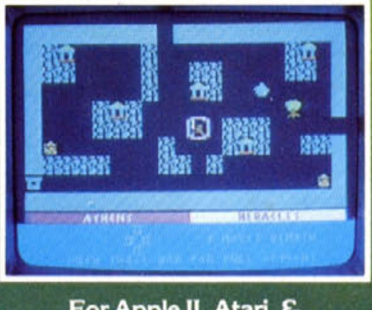
The computer adventure you've been waiting for...

THE RETURN OF HERACLES™

An exploration of Greek mythology translated into modern electronics
by Stuart Smith



The creative mind of Stuart Smith, author of ***Ali Baba and the Forty Thieves,*** brings to life the world of mythic Greece in fantastic color and sound! Carefully researched and skillfully programmed, ***Return of Heracles*** is computer entertainment at its best. Twelve difficult and dangerous tasks will be assigned to you by Zeus, and your heroes must accomplish them all. One or more players take on the role of an ancient Greek hero or heroine. There are 19 heroes to choose from, or choose them all! May the gods favor you!



For Apple II, Atari, &
Commodore 64 home computers.
On diskette. Requires 48K. $32.95

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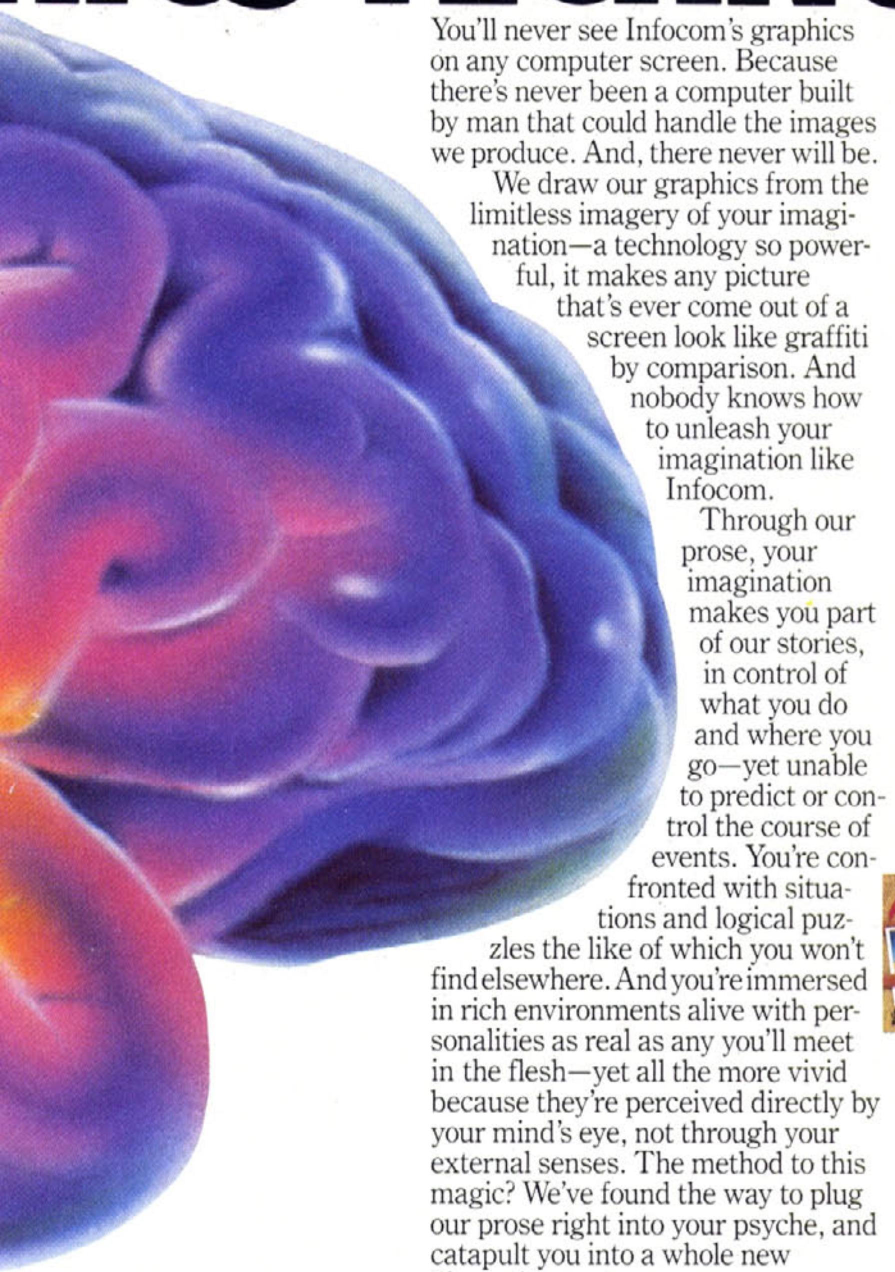

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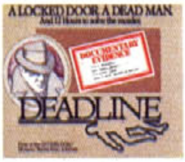

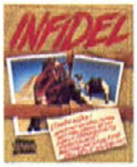

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The Logical and the Dead

by Monte Schulz

The text adventure game is growing up. It has resisted the appearance of hi-res graphics and sound-effect gaming and has moved instead in the direction of legitimate computer fiction, offering true plots, coherent story lines, and a parser that understands complete sentences.

Yet the heart of every adventure is still its puzzle structure—the challenge and the reward of slugging it out with a program designed at once to frustrate and enthrall. Adventure puzzles, done well and fairly, are things of beauty: the problem of the Giant Room and the Troll Bridge in *Adventure*, the Oddly-Angled Room and the Bank of Zork in *The Wizard of Frobozz*, the Red Docking Port in *Starcross*, and the "Translucent" maze in *Enchanter*. Each of these puzzles provides the adventurer with everything needed to discover its secret without being so obscure as to become a turn-off to the rest of the game. Just as a good puzzle can create a genuine enthusiasm for the game, a bad one—either too easy, or worse, absurdly difficult—can easily destroy one's interest in the program.

One of the immediate criteria that might be considered in evaluating both a game and the individual puzzles within the game is the idea that the player, as a real-life character in the adventure, ought to have a fair chance at solving the puzzles (and, in fact, the entire game) on the first run-through without the use of a save/restore feature—that is to say, no puzzle is fair that requires the player to go through an exhaustive trial-and-error period before it will yield a solution, particularly when failure means either becoming hopelessly mired in a no-win situation or coming upon a quick and irrevocable death. This does not mean that either the game or the puzzles within the game ought to be overly simple—only that the game must have a certain integrity to it, allowing the player to trust the logic and consistency of the puzzle structure.

The most widely played text adventures today are the three underground fantasies that make up Infocom's *Zork* trilogy. Anyone paying close attention to the descriptions of rooms and objects should be able to tough out the puzzles in these games within a reasonable length of time.

((I (Eat What I) See) What I Eat.) The *Zork* series presents a variety of problems calling for logical, deductive reasoning as well as creative thinking. Patience is also a virtue when playing *Zork*, because some puzzles definitely require extensive thought. No game is perfect, however, and even in a program as carefully written as *Zork*, there are a few instances where the player can easily become trapped in a situation where too much is asked of, and too little provided for, one encountering the puzzle for the first time.

A good example of this is the "Alice" section of *Zork II*. In this case, there are two problems requiring as much luck as logic, and to complicate matters they are interconnected. The first situation is this: Entering a small room from the west, you find yourself standing in front of a table apparently set for afternoon tea. On the table are four cakes singularly colored green, blue, red, and orange. On the green cake is some lettering that reads simply, "Eat me." The other cakes also have some lettering, but it is too small to be read with the naked eye. On the east side of the room is a mouse hole, and to the northwest is a larger exit. What to do? Ignore the cakes? Play with the cakes? Cut them? Eat them? Eat a couple now and take the others along on the chance you might think of a use for them somewhere later on (maybe the unicorn in the garden will trade you the gold key for the blue cake)? One thing is certain: Making the wrong decision is certain to affect what comes later, yet there are no clues provided as to what action is correct.

The second half of this problem finds you standing in a strange room at the side of a pool of water (salty tears, apparently, although their origin is never revealed). There is a hazy something under the water at the deep end of the pool, and a transparent bottle marked with a skull and crossbones lies at your feet. You want to get whatever it is out of the pool, and at the same time you are awfully curious to know what is inside the bottle, even though you suspect that the contents might be dangerous.

The obvious thing to do here would seem to be to try entering the pool in order to salvage whatever it is that lies hidden on the bottom. Do this, however, and you drown. Never mind that nowhere else in the Great Underground Empire will this happen. (In most instances, a player will simply be denied access to the water.) Yet here, for no apparent reason and with no warning, you die. In this case, the solution requires that you have something in your possession you were expected to have picked up elsewhere. However, if you don't have what you need when you enter the Pool Room, you can never get it.

The problem with the Tea Room/Pool Room section is not necessarily its difficulty. The function and meaning of the four cakes and the solution to the retrieval of the object in the pool of tears can be deciphered without too much difficulty through judicious use of that old standby method of problem solving: trial and error. And that is the problem. What should be a cleverly written exercise in logic becomes merely a guessing game whose chief component is the scratch disk for saving and restoring.

In this case, the construction of the puzzle does no more than confuse the player. In other instances (and less well-constructed adventures), where perhaps trial and error is less effective, confusion can easily lead to frustration and eventual weariness with the game. Certainly there are players who will let nothing dampen their desire to solve the puzzles and finish the game. But many other players either run out of patience or simply lose heart before they complete a game—and thus potential adventure game players are lost to the genre.

The First One Won't Kill You. Programming large numbers of booby traps in an adventure game can also be a big mistake. The "ha-ha, you're dead!" kind of writing, setting the player up for dozens of gratuitous deaths, seems unfair and easily becomes a tedious distraction. *Planetfall* author Steve Meretzky has stated his dislike for this kind of hazard in adventures. Besides *Deadline* and *The Witness*, his game is probably the most playable on a first run-through for just that reason. In only one place in *Planetfall* does the adventurer run the risk of a surprise death, and even then, though it is completely unexpected, it can be avoided quite easily, and most players will probably not even stumble upon it.

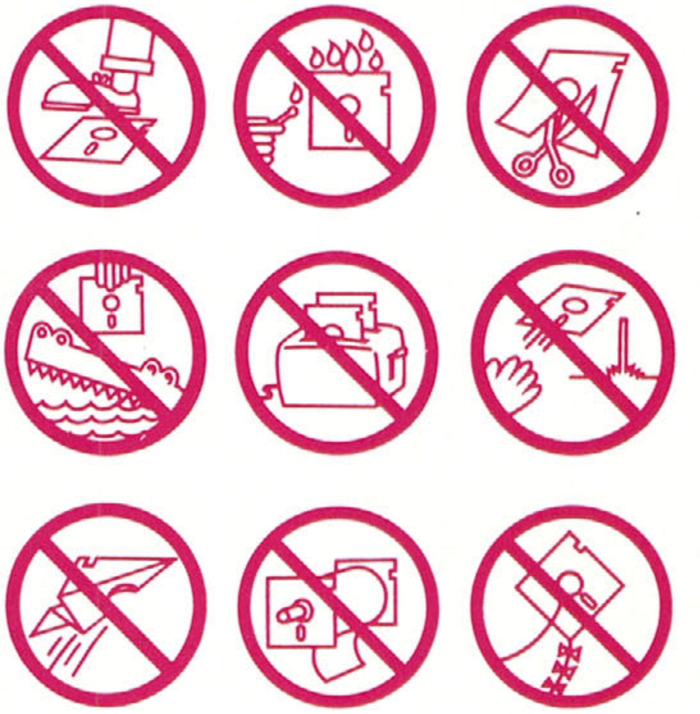
In *Enchanter*, it is quite easy to die time after time in the temple area of Krill's castle. But since there's something to be learned by these deaths, and because the novice enchanter is returned quickly to the fray, spellbook in hand, there is not the same feeling of frustration and anger at being tricked into entering a hopeless situation as there can be in several other adventures where bad luck translates into "game over." In the case of Krill's Temple, though there is no real way to differentiate between a safe room and a dangerous one, and no time to escape the trap when it is sprung, constructing the game in such a way that the deaths become a kind of necessity to solving the adventure completely changes the meaning and nature of the danger.

Adventure puzzles, after all, ought not to inspire unnecessary feelings of paranoia. Rather, with the exception of the kind of combat situations one finds in *Adventure* and the first *Zork*, death in an adventure game ought to be the result of a player's indiscretion and foolishness, not simply of chancing upon a random hazard. Such pitfalls detract from the cleverness of the game and, again, make the use of a scratch-save disk almost as mandatory as the game disk itself.

Of course, even a logical, straightforward puzzle structure is no guarantee that a player will be able to race through the game in record time. Any adventure worth the cost of entry will frustrate players to the point of irritation before allowing them to reach the end of the game. But there is nothing wrong with that. Marc Blank himself has said that it's preferable for games to be too difficult than too easy; at least with a difficult game, in terms of value (dollar per playing hour) players get their money's worth.

This last point is possibly the most crucial, because ultimately each game will be judged not so much on its cleverness as on its pure entertainment value. When a game is found to be engaging and fun to play hour upon hour, players feel they've found a good value and may decide to go back and purchase another, regardless of whether they solved the first one. A well-conceived and well-produced game will clearly have a better chance of achieving this final result than a poor one. With adventure games, the puzzle structure will be the deciding factor.

NO CONTEST



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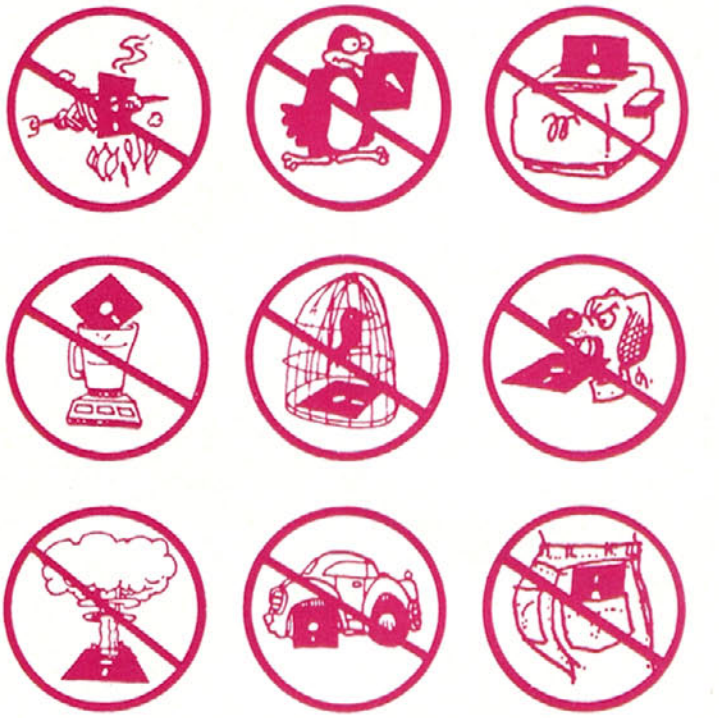

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Consider the floppy disk. Admirable little retainers and dispensers of data, performing their function ceaselessly and uncomplainingly, making only an occasional whir or a shuddering clatter and thud, as if to say: "Hey, I'm here. I'm listening. I care. I'm doing my thing and you're doing yours. I was not put in this world to live up to your expectations, nor you to mine. And if by chance I crash, wiping out the last six hours of work, a fifty-dollar game, or the read-write head, it's beautiful."

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Concept counts—we're not looking for high art, though if you can knock our eyes out that's an obvious help in the attention-getting department.

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Generic Contest. "You may already have won! Or not. But you can't win if you don't enter, so read the fifty-seven easy rules printed in three-point type on the back of this fortune-cookie slip. . . ."

Yes, we've all been victimized by this kind of junk mail terrorism. What a pain, huh? One Publisher's Clearing House mailing can take up your whole day. And the jolly old No Contest contestmeister knows that *Softline* readers like only one thing less than deadlines, and that's rules. So in this contest, there aren't any. And you don't have to enter to win. Just send us an indication of your desire to enter a contest. If you'd rather not enter, let us know that, too. And you could win! Really! Just send us a reason. That's it! That's all!! Now here are the rules (oh, shut up):

There is no stipulation regarding traditional media—that is, printed matter. You need only send . . . something. Something direct. Bold. To the point. Something . . . strange. The most attention-getting nonentry wins. The feared Random Number Generator will not be involved. It's just you against the universe, armed only with your guts, brains, greed, and native sense of the absurd.

Did we say "greed"? Sorry. We meant "avarice." The winner gets $500, no questions asked. You must be worthy. You've got extra time for this one. Make it count.

Send entries to Softline Plain Wrap. Postmark deadline: April 1, 1984. (The post office does make pickups on Sundays. No excuses.)

Krossword Kapers. They're coming. You can hardly wait. They're almost here. So close you can taste it. They're still coming. Okay, they're going to be a little late. Listen, the traffic downtown is murder. This time next issue, more crossword fun than you should be allowed to have will jump right into your face. Sharpen your pencils. Trust us.

You Could Write the Next Bloodquest. Broderbund's Atari Arcade Machine contest kicks off in January, running through June 30. Original game designs using the *Arcade Machine* will be judged on the basis of creativity, originality, playability, and the extent to which the features of the *Arcade Machine* are used. There will be a winner-a-month of $200 worth of hardware and software, all eligible for the grand prize of $1,500 worth of hardware and software, to be awarded in July 1984. Complete details available in the Atari Arcade Machine package, or by writing Broderbund, 17 Paul Drive, San Rafael, CA 94903.

Winners' CIRCLE

Friday Night Video Games. Television is good for the soul. If not that, then the bank account. Or the software library. In the GTV contest, zillions sat down at 7:00 and played their hearts out until 10:00, when they switched over to *The New Show*. The highest possible score for three hours' playing time was a whopping 542,779.

Unfortunately, zillions of contestants submitted the same score. Some were even verified with screen shots. Shane, Norman, Buell (III and IV), Hymie, where were your scores? The only civilized thing we could do was to throw all the tied contestants into the uncivilized Random Number Generator. When the dust had settled, Hugh Johnson (Johnson City, TN) emerged as the winner.

Johnson, who seems to have a habit of living only in those cities that bear his name, was wearing Eau de la Machine cologne, which may have had something to do with it. Johnson receives a membership to the GameMaster gaming system plus $100 worth of software for his machine.

Oops! Department: No kudos to Dan Leary (Reston, VA) or Brad Sagarin (Carmel, NY), who chose to read *TV Guide* from cover to cover. Nice going, you two. But you can't play from 7:00 to 8:00 to 9:00 to 7:30 to 8:30 to 9:30. Time doesn't work that way.

Also receiving no prizes are Ken "No, Not That Ken" Williams (Davie, FL), Kent Christian (Falls Church, VA), and Robert Mills (Memphis, TN). These poor souls got hooked on *Escape from Des Moines* and liked it so much that they played it several times. Sorry, gang. But the rules said, "You can't play the same game more than once." Christian especially receives no prizes. "Even though several hundred other people probably got the right answer," he wrote, "I should win because I solved the problem using differential calculus and linear network equations." Well, that says maybe, Kent. Maybe next time you can write some equations to define what "more than once" means.

Answer department: Yes, there was more than one schedule you could play to achieve a score of 542,779.

No, we didn't count entries twice if they showed both schedules.

And yes, 9-Lives is a trademark of Star-Kist Foods.

Just so we can all live with inner peace, here are the game schedules that yield the most points:

Channels: B, C, A, A, C, C
Games: *Suspenders*
Alien Fog
Gumshoe
Escape from Des Moines
BFD
Shoplifter

Channels: A, C, D, D, C, C
Games: *Gumshoe*
Alien Fog
Escape from Des Moines
Suspenders
BFD
Shoplifter

Paaarty! C'mon, gang, admit it. The Partygame contest must be the easiest contest ever in the history of *Softline*. And for what? A prize consisting of all the games or $424.40. Where else could you win this kind of bread for just a few minutes' work, not counting robbing winos on Skid Row? No-stinking-where, that's where!

Nonetheless, Partygame had a relative handful of contestants, and very few finalists. Whatsa matter, afraid of success? Joe Schwartz (Andover, NJ) has no such fears. In fact, he told us in no uncertain terms that he was the winner. (Later, we found out that he says that to all the magazines.)

Schwartz was the only contestant to identify correctly all the characters on the cover of the magazine and send in his entry on time. Schwartz decided to take the cash, which he'll spend on either "the IBM PC pee-wee (you know, the one that comes with a stylus to press the keys with)" or a Synetix SuperSprite board. Since the cash covers only the SuperSprite, Schwartz's IBM pee-wee will have to wait. Congrats, Joe.

No, Theodore Chen (Potomac, MD), we didn't lose your entry. Even though Chen's entry was also correct, it seems he lost his calendar. We mean business when we set deadlines. If you don't want to play by the rules, we'll take our $424.40 somewhere else to play. So there.

Turn the page to see the games the party guests are on leave from. No arguing.

Hall of Fame Housecleaning. Lord, what a battle. Deb Bickford, knocking Al Holland out of the *Dark Forest* by a single point; Glenn Stallop beating Eggy Paul to the one million cutoff point on *Tax Man* by the thinnest possible margin; elaborate documentation, pictures, maps, and "my mom saw me do it." When the shouting was over, the following had all won the free game of their choice and added a heightened luster to the Hall of Fame:

Borg,	Jeff Rosenberg,	32,330
Ceiling Zero,	Brett Milgrim,	86,360
Crazy Mazey,	Jeff Stallop,	level 20/130,000
Dark Forest,	Deborah "One Point" Bickford,	16,365
Dragon's Eye,	Bruce Schlickbernd,	6,510
Jawbreaker I,	Frank Cascio,	971,620
Minotaur,	Scott Storkel,	level 32/627,405
Missile Attack,	Chris Athanas,	36,580
Photar,	Todd Yamada,	167,382
Planetoids,	Jim Feinberg,	2,473,710
Pulsar II,	Jim Davis,	94,592
Roach Hotel,	Frank McCoy,	13,510
Taipan,	Mark Hessman,	409 trillion
Tax Man,	Glenn Stallop,	999,990
Threshold (Apple),	Doug Burger,	999,400
Torax,	Geoff Dunn,	49,830
Track Attack (Atari),	Eddie Niya,	46,033
Twerps,	Clark Alyea,	7,010
Wormwall,	Tom McDonald,	254,912

Welcome to the hall, y'all. Maybe we'll do this again sometime.

CompLit Concludes. The manuscripts are in on the CompLit contest, and the winning translation of a scene from Our Literary Heritage into interactive computerese appears herein. Author Rob Carter's (Athens, GA) reinterpretation of *A Tale of Two Cities* was sufficiently imaginative and respectful of copyright laws, and the original author sufficiently dead, to cop his choice of games—*Deadline*, *Starcross*, *Enchanter*, *Planetfall*, and *Ultima III*.

Dispute Dept. Gary Geniesse (Osprey, FL), the illustrious president of Zombo Prod, thanks us for printing his letters and giving him money and stuff, and then wouldst fain take us to task over the judging of the Markup contest (September–October 1983), which required the very selective purchasing of $422 million worth of arcade, adventure, and strategy games. Geniesse lost. Big. "Any lamebrain could arrive at *your* winning answer," wails the ungracious Mr. G.

Well, obviously not every lamebrain. Despite the fact that the winning entry had to have "as near to an equivalent number of each type of game as possible," the Zombo prexy maintained that his 244-game discrepancy between categories should have been ignored. Sigh. We trust the rules of this issue's generic contest will serve to soothe Mr. G and all those of the same mind.

Translated from A Tale Of Two Cities

YOU ARE IN THE CELL OF CHARLES DARNAY
ITEMS IN SIGHT ARE: A TABLE, A WINDOW, A CHAIR
OBVIOUS EXITS: WEST

STONE CORRIDOR AFTER DARK STONE CORRIDOR, UNTIL, AT LONG LAST, YOU COME TO THE DOOR LEADING INTO THE CELL OF DARNAY. BARSAD DRAWS FROM HIS COAT POCKET A RING OF KEYS, AND UNLOCKS THE DOOR. BEFORE HE OPENS IT, HE TURNS TO YOU AND SAYS IN A LOW VOICE, "HE HAS NEVER SEEN ME HERE; I HAVE KEPT OUT OF HIS WAY. GO YOU IN ALONE; I WAIT NEAR. LOSE NO TIME!" AND WITH THAT, HE LEAVES YOU.

– >OPEN DOOR, ENTER ROOM

THE PRISON DOOR CREAKS WITH THE SOUND OF STEEL ON STEEL, AND WITHIN AN INSTANT YOU ARE INSIDE THE CELL, FACE TO FACE WITH A QUITE SURPRISED CHARLES DARNAY.

– >"OF ALL PEOPLE, YOU WERE LEAST EXPECTING ME?"

"I COULD NOT BELIEVE IT TO BE YOU," SAYS DARNAY. "I CAN SCARCELY BELIEVE IT NOW. YOU ARE NOT"—THE APPREHENSION COMING SUDDENLY INTO HIS MIND—"A PRISONER?"

– >"NO. A GUARD WHOM I'M BLACKMAILING LET ME IN. I HAVE A REQUEST FROM YOUR WIFE."

"WHAT IS IT?"

– >"DON'T ASK. I'M SHORT OF TIME. JUST DO EXACTLY AS I SAY."

DARNAY, ALTHOUGH MUCH PERPLEXED AT YOUR ACTIONS, AGREES.

– >TAKE OFF BOOTS, COAT, HAT

IN AN INSTANT YOU HAVE REMOVED THESE. DARNAY LOOKS AT YOU, CONFUSED AS EVER.

"CARTON, THERE IS NO ESCAPING FROM THIS PLACE," HE SAYS; "IT CAN NEVER BE DONE. YOU WILL ONLY DIE WITH ME. IT IS MADNESS."

– >TRADE BOOTS, COAT, HAT WITH DARNAY

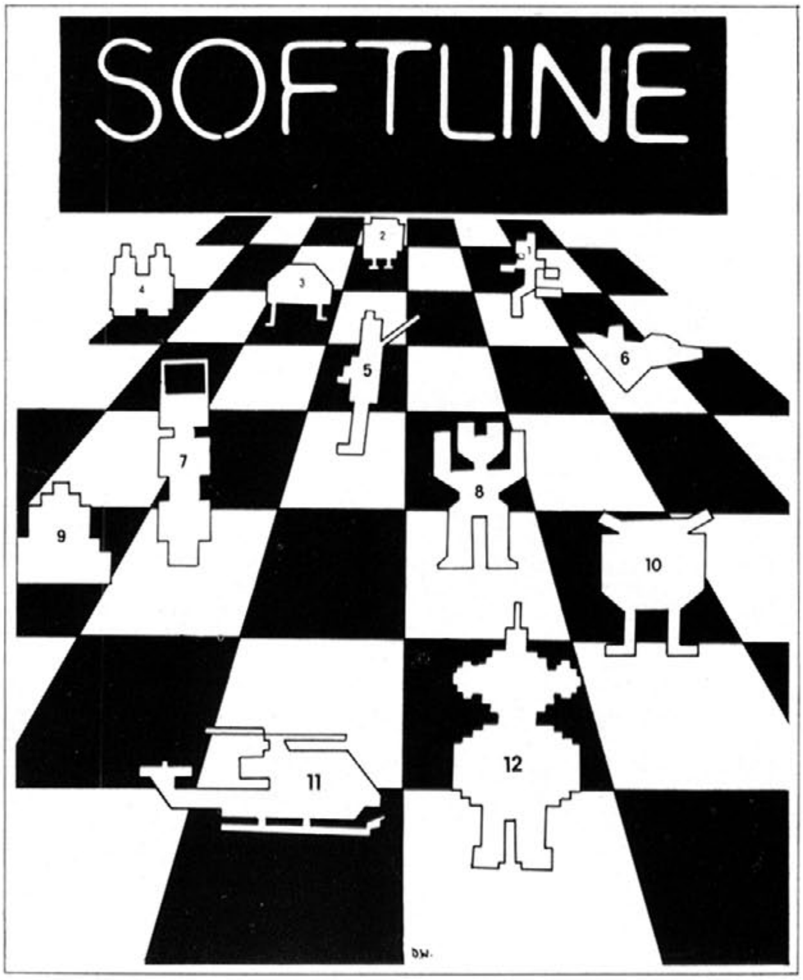
WITH WONDERFUL QUICKNESS, AND WITH AN ALMOST SUPERNATURAL STRENGTH OF BOTH WILL AND ACTION, YOU FORCE THESE CHANGES UPON HIM.

"CARTON! DEAR CARTON!" IMPLORES DARNAY, "IT IS MADNESS. IT CANNOT BE ACCOMPLISHED, IT NEVER CAN BE DONE. IT HAS BEEN ATTEMPTED, AND HAS ALWAYS FAILED. I IMPLORE YOU NOT TO ADD YOUR DEATH TO THE BITTERNESS OF MINE."

– >"OH, ALL RIGHT."

YOU LEAVE THE PRISON, SAVING YOUR OWN LIFE, BUT DARNAY, IN BUT HALF AN HOUR, IS DEAD; SLAIN BY THE MERCILESS GUILLOTINE. YOU HAVE BROKEN YOUR PROMISE, AND LOST. WOULD YOU DESIRE ANOTHER GAME? (Y/N)

—**Rob Carter** SL



1 LODE RUNNER
2 MR. COOL
3 SNEAKERS
4 A.E.
5 CANNONBALL BLITZ
6 ZAXXON
7 SERPENTINE
8 EXODUS: ULTIMA III
9 BANDITS
10 CROSSFIRE
11 CHOPLIFTER
12 GRUDS IN SPACE

Part 1: The Speed of Color

by Matt Loveless

Most aggressive would-be game designers quickly exhaust the possibilities of that tiny 8K Basic cartridge supplied by Atari and soon move on to more powerful and complex graphic manipulations. This usually means learning assembly language and mastering the innards of the Atari machine. Unfortunately, there is very little covering the gap between the passive Basic environment and the hostile world of machine-level programming. The goal of this series is to bridge that gap by presenting advanced graphic techniques in terms of concepts already familiar to Basic programmers.

Let Us Begin. Running the show inside the Atari computer is a tiny slab of silicon dubbed the 6502. The 6502 is a microprocessor that performs specific tasks via a machine language program. A machine language program is nothing more than a sequence of instructions stored in sequential memory locations. Since machine language is just a group of numbers, any correlation between a number and the function it performs is virtually nonexistent. Thanks to assemblers, this is of little concern. Assemblers allow programmers to write instructions in an abbreviated form—something closer to a human language—using abbreviations called mnemonics (literally, memory aids). When a program is "assembled," these mnemonics are converted into numbers that the 6502 can understand.

The two pieces of equipment necessary for learning assembly language are a good assembler and a book on 6502 programming language. Two of the best books on 6502 programming are *The Atari Assembler* by Inman and Inman, and *6502 Software Design* by Leo J. Scanlon. Two of the best assemblers are *MAC/65* by Optimized Systems Software and *AMAC* (Atari Macro Assembler) by Atari. However, the one you probably have is the Atari *Assembler Editor* cartridge. We'll be printing programs for the *MAC/65* and noting differences as we go along.

In addition to the 6502, there are three other chips that comprise the Atari computer: POKEY, ANTIC, and TIA. Since the POKEY chip handles such things as the keyboard, sound, and peripheral I/O, it doesn't concern us much, but the TIA and the ANTIC are of great importance. TIA is an acronym for Television Interface Adapter. Its job is to maintain the television display by sending a stream of color/luminance data to the TV sixty times per second. ANTIC, which stands for Alpha-Numeric Television Interface Controller, is virtually a slave to the TIA. Its job is to create an interface between the computer's memory and the TIA. There are currently two versions of the TIA in circulation: the CTIA and the GTIA. The CTIA was installed in the original Atari computers but was replaced in 1981 by the GTIA. The GTIA adds a few special features that aren't available to the CTIA. As a general rule, though, anything that works on a machine with a GTIA chip should work on a machine with CTIA, as long as none of the special features are utilized. The use of those extra features will be addressed in a future article.

Color Me Set. The *setcolor* statement in Atari Basic is one of the most fundamental instructions used in creating graphic displays. The setcolor statement requires three parameters: a color register, a color, and luminosity. What Basic actually does with these three elements is fairly simple. Basic takes the color value, multiplies it by 16, adds the luminosity value, and stores it in a memory location that corresponds to the selected color register. A color register is simply a memory location that can be modified by the setcolor command according to a few simple rules. Color registers may also be modified directly by either a Basic poke or a machine language store command. Some color registers and their memory locations appear in the accompanying table.

Setcolor Register	Register Name	Location Hex	Location Dec
0	COLOR0	$2C4	708
1	COLOR1	$2C5	709
2	COLOR2	$2C6	710
3	COLOR3	$2C7	711
4	COLOR4	$2C8	712

Using the color registers directly is simplicity itself. The value that corresponds to the desired color is multiplied by 16, the luminosity added to it, and the total poked into the desired color register from the table. For example, to set the background to a dark red, you could use either of the two following statements:

```
SETCOLOR 2,5,2        (register 2, color 5, lum. 2)
POKE 710,84           (register 2, 84 = 5*16 + 4)
```

To modify a color register using machine language is almost as simple. All you need is a load instruction (LDA) and a store instruction (STA). If you have an assembler, you can type in the following program and execute it. The program is written in *MAC/65* format but could be converted to virtually any assembler with little effort.

```
10  COLOR2 = $2C6    ;(DECIMAL 710) color of playfield 2
                          register location
20  .ORG $600        ;assemble onto page six
30  LDA #84          ;color to store in decimal (84 = 5*16 + 4)
40  STA COLOR2       ;set the color
50  RTS              ;return control to caller
```

Changing a color in machine language is not always advantageous, because the speed gained by changing the color so quickly will go unnoticed if it is only changed once. Where machine language comes in handy is when a color register needs to be modified at extremely high speeds for special effects. But let's not get ahead of ourselves.

The Atari machines offer an incredible amount of display power, and when pushed to the limit they can produce some remarkable visual images. This series of articles will open the door to many graphic enticements and may even lead to the creation of a few video games. Next time we will discuss such niceties as display lists and graphics modes. Meanwhile, we'll all rigorously practice our color-setting skills until the call once again goes out: "Assemblers Assemble!" SL

Matt Loveless bought his Atari in 1981, taught himself assembly language, co-authored a utility package called Page Six, *and is now working for Synapse Software as a game designer.*

Two memorable events occurred that bleak February afternoon at the Text Adventure Writers Guild.

A number of us had taken refuge from Chicago's winter in the Commons Room at the Guild's Hall on Lakeshore Drive and were in a state of semihibernation—some seated at rolltop desks, hatching our next plot; others quietly conversing; a few dozing in leather chairs, feet propped up on handy ottomans; and still others reading esoteric books or journals, many of which were scattered over the tables in the room.

Although it was only midafternoon, what passed for the sun in winter was already lost behind leaden clouds so that only a feeble light penetrated the high French doors set in the southwest walls. Both fireplaces had been lit, and their cheery light, added to that of the high chandeliers and the reading lamps turned on here and there, made the room a haven of warmth, a comfortable den in which to semihibernate.

The first memorable event occurred when Latimer Eutheria had an idea. The second was when something was done about it.

Eutheria, who was teasingly called Rodent behind his back—due to his long ears, pronounced overbite, wispy moustache, and a habit of twitching his nose when disturbed—had been sitting hidden in one of the deep chairs set into an ell in the northern wall of the Commons. He rarely said anything, and even if he did, no one paid him any attention. His admission to the Text Adventure Writers Guild had been based on three things: He had a great (almost fanatical) love for the fantasy world of text adventures, he had once written a twelve-line adventure (in Basic, on a Timex computer), and he was fabulously wealthy—thanks to his being the sole heir of the Rock Hare holdings of a wealthy uncle in Australia. We at the Text Adventure Writers Guild may have principles, but they can be compromised if the price is right.

In any event, Rodent had been reading the current issues of *Dragon*, *National Parks*, and *Orthodontia Weekly* when he looked up to say: "Hmmm. Aha. Yes, indeed. It can be done. Why has no one done it before? How marvelous. What a magnificent thought. My! Oh my!"

Rodent arose from his niche and skittered over to where I was sitting watching the fire and nursing a pink gin, waiting for what was left of the sun to slide over the yardarm.

"Rose," he began, "Rose, I've been thinking. It seems to me that you've been on the wrong tack...entirely the wrong tack. Those articles you've been writing for *Softline*—you know, the ones where you try to explain how to write text adventures to people who think they might want to write such things. What's your biggest complaint...hmm?"

"Eutheria," I said, "what does it matter?"

"Because," he replied, "I think Dr. Beinurger's biting article provides the key to solving your problem."

"Well, it isn't really a problem, but the greatest number of inquiries I receive relate to converting the program listings from one computer to another. Because Basic is slightly different from machine to machine, novices are constantly complaining that programs will not run exactly as written. Of course they won't!"

Rodent began jumping up and down. "Precisely! But they will, they will, if only you write the programs *properly*. It's not Basic that's the problem; it's you that's the problem."

He continued, "You see, all teeth of vertebrates are merely modified descendants of bony dermal plates that protected ancestral fish. All true teeth are made on the same general plan. Early on, teeth were similar in shape, but by the time bony fish and mammals came along, teeth became heterodont...er...they began to have different shapes for different functions."

"Everyone knows that," I said.

"As evolution continued, teeth changed. One of the easiest ways to trace human racial lines is to observe the relative size of the front teeth compared to that of the cheek teeth—incisors and canines versus premolars and molars."

"For heavens' sake, Rodent," I said, "get to the point."

"Don't you see?" he said triumphantly. "American Indians have shovel-shaped incisors!"

"So what?"

"So what! So what! So do Asiatic Mongoloids!"

"I've got it," I sarcastically remarked. "I'm supposed to write a Basic adventure about prehistoric Indians attacking prehistoric Mongols with their teeth."

"No, no, no! The teeth are merely an analogy. You see, you've moved too high up the evolutionary scale of Basic. Move back down—down to basic dentition, so to speak. Extract from Basic only those things you absolutely need to write an adventure. Bridge the gap between high-level adventure plots and low-level adventure writing."

After this diatribe, Rodent stood staring off into space, panting quietly. His glazed expression then cleared, and he clapped me on the shoulder, muttered something under his breath, and slowly wandered off in the direction of the tea room for his afternoon snack of biscuits, cheese, and Oolong tea.

I reflected on what he had said.

It was all quite true. After all, Basic is a pretty straightforward language, and all we've done is muck it up by making it complex. What if

Adventures In Adventuring

by Ken Rose

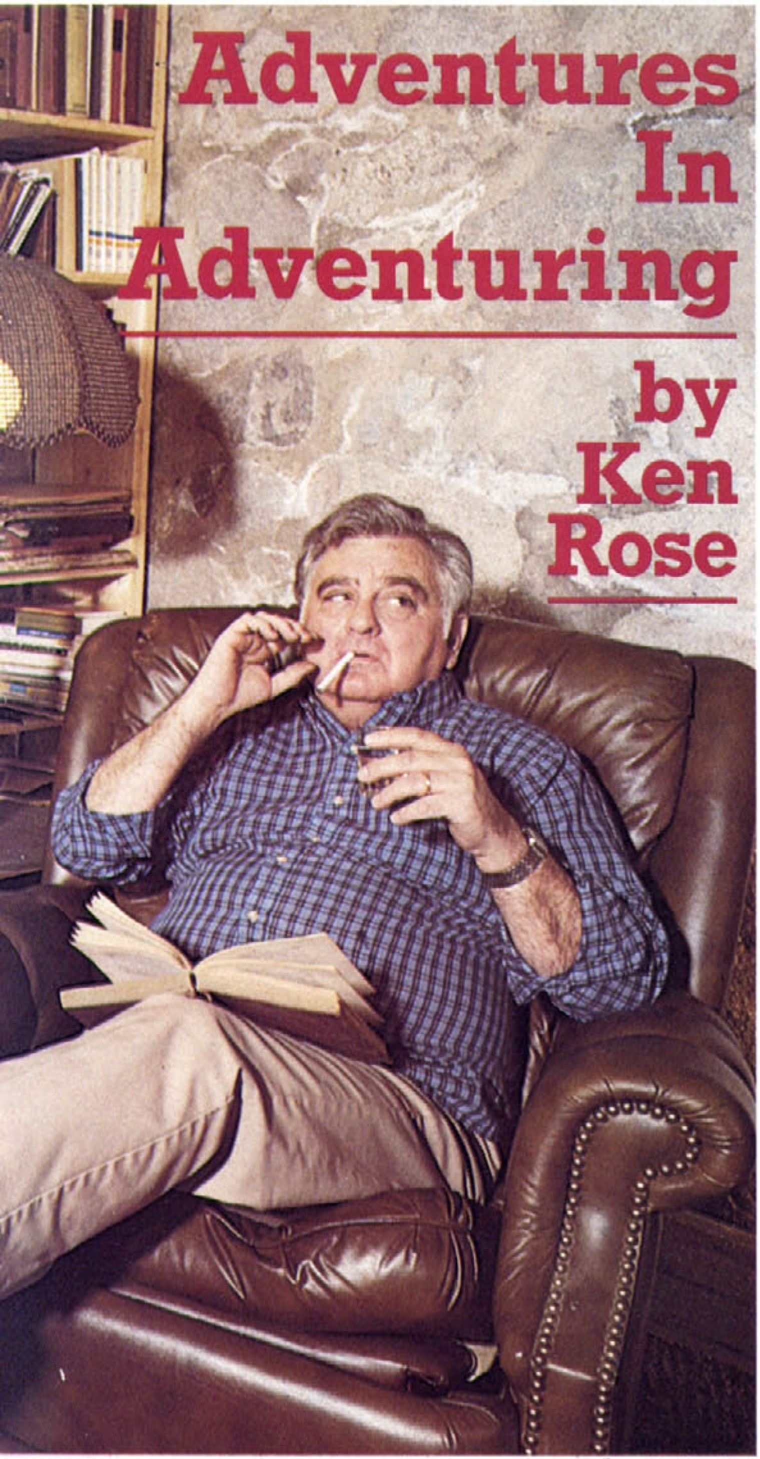


Photo by Tim Durr

we wrote a complex adventure using the fewest and simplest commands needed? Are they common to all Basics?

With one exception, the following commands will handle a complete, complex adventure. The commands are:

For Next
Goto
Gosub
If Then
Input
Print
Rem (optional)

Now for the exception. The parser (the thing that recognizes and splits verbs and nouns) relies on splitting the verb and the noun (Get Chicken) by finding the blank in the middle. It runs from line 60 to 260. The parser in the program listing will work with simple Basics having a Len command—that is, it will work with Atari, Timex, and Apple Integer.

However, if your version of Basic has a MID$, LEFT$, and RIGHT$ function, as well as Len, then lines 60 to 160 will stay the same, but lines 180 to 260 will change. This will work with Applesoft Basic, IBM Basic, Vic 20 and Vic 64 Basic, as well as TRS-80 Basic.

```
180 IF MID$(A$,A,1) = " " THEN X = A - 1
185 IF MID$(A$,A,1) = " " THEN A = 0
190 IF MID$(A$,A,1) = " " THEN GOTO 205
195 NEXT A
200 V1$ = A$
205 IF V1$ = A$ THEN GOTO 270
210 V1$ = LEFT$(A$,X)
215 IF RIGHT$(A$,LEN (A$) - X) = " "THEN N1$ = ""
220 IF RIGHT$(A$,LEN (A$) - X) = " "THEN GOTO 270
225 N1$ = RIGHT$(A$,LEN(A$) - (X + 1))
230 X = 0
```

If all else fails and neither of these works, then use two separate input statements. Delete lines 140 through 260 and substitute:

```
140 PRINT "INPUT VERB";
150 INPUT V1$
160 PRINT "INPUT NOUN";
170 INPUT N1$
```

(Eutheria, upon reading the latter, commented favorably on its simplicity, as this was the parser method he advocated.)

In the interest of running this program on anything, anywhere, you'll note that there are no multiple statements on any line. You'll also find that string variables (those are the things that hold letters as well as numbers) are dimensioned to handle the length of the word they will contain. In some Basics, A$(10) means that there are ten elements in the array called A$. Each of these elements will hold 255 characters. In more elementary Basics, A$(10) means that the single array A$ can contain no more than ten characters. This second treatment is given to strings, as it must be used with simple Basics and won't bother more complicated ones (except to use up memory). Numeric variables will present no troubles.

The final program will take you on a complete adventure through ninety rooms. This month, you will only explore the first six. *If you have any trouble or comments, write to this magazine. Be sure that everything is typed in exactly as shown. Include the type of machine you are using, the type of error you are getting, the line number where the error occurs, and your name, address, and phone number.*

* * * * * * *

(Editor's Note: First problem locked in and logged, Captain. Our intrepid editorial Basic weasel couldn't resist trying this out in Applesoft, and recommends the following changes for sanity's sake:

Use the parser listed above—the one that Eutheria didn't prefer.

The variables in lines 2100 through 2120 don't need to be dimensioned, but take a look at those lines anyway. The variable names used will cause great confusion with Applesoft. Applesoft only recognizes two significant characters in the names of its variables, so W1$, W10$, W11$, and so on are all thought to be the same variable throughout the program.

W1$ through W9$ are cool, but you'll want to change the names of W10$ through W28$. That's nineteen variables to rename. Muffy and Skipper are swell names, but you *might* prefer something practical like WA$ through WS$. Make a table with the old names on one side and the new names on the other. If you've already typed the listing in, you'll have to edit a lot of lines. *GPLE* from Beagle Bros can help you do this, as can *AppleWriter II* or *ScreenWriter II* if you're willing to mess with text files. If you waited to read this before blindly typing ahead, put your head in global search and replace mode and dive into it.

On the other hand, if you can get Integer Basic, use it. We know that works.) The adventure begins on page 27. SL

Brian Fitzgerald

Anatomy of a Game Part 3

Robot by Trici Venola

Photo by Kurt Wahlner

Everyone here's seen *The Right Stuff*, right? What do you mean, no?! Where have you been, Tierra del Fuego? Oh. So, how's the weather down there?

What's the movie about? It's about, oh, three and a quarter hours long. It's also about those pilots with the Right Stuff—the ones who fly the fastest, the highest, the farthest—and about how the pilots with the Right Stuff became the first astronauts, the only folks who could get that high without getting in trouble with the police.

This movie started your correspondent thinking about corollaries, such as programming. What group of programmers has the largest percentage of those who write the fastest, trickiest, most innovative (and torturous) code? What group of programmers is constantly trying the impossible, pushing the outside of the envelope, looking for trouble? What group of programmers has the Write Stuff (ha ha)? Yes! Game programmers! And your humble servant will back that all the way, having worked on databases, word processors, operating systems, assemblers, and many things in between, as well as on "mere" games.

Now that we've had our pep talk, on to the main thrust of this article. Read on, and see if you have the Write Stuff, too.

Don't Budge an Inch. Last time, we looked at some elementary routines—low-level graphics stuff that is tedious to go over but essential to the game. If you're still confused, check out Bill Budge's graphics column in *Softalk*; it's pretty good; of course, it's Budge (awesome, Bill!); although this is too many semicolons for one sentence. Editors, when riled, are dangerous; and this sort of thing; to excess; can really set them off.

The elementary stuff being over with (for now), let's do something, make something move. Check out figure 1, a diagrammatic view of a fragment from the game. The dotted lines are at one-half, one-fourth,

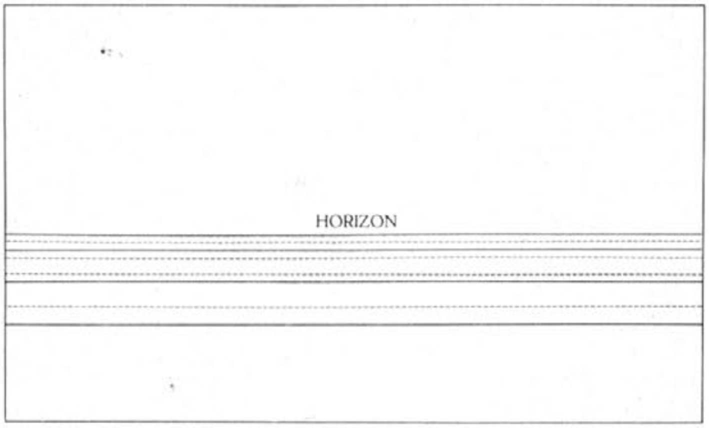


FIGURE 1.

one-eighth, and one-sixteenth of the way from the horizon to the pilot in his or her plane/shuttlecraft/spaceship/whatever. The solid lines are perspective lines that we'll use to trick the eye into thinking that we have depth on the CRT—that the horizon is miles away instead of inches. Now, when the craft is moving, the distance lines will move on the screen to give the illusion of movement. Move forward, and the lines will roll from the horizon to the viewer; move backward, and the lines will roll from the viewer to the horizon. (We'll put off rolling and climbing and diving for now.) But how? Let's think a moment.

Consider what it's like when you're on the highway in a car. The road signs just up ahead flash by, but that bridge eight miles down the road gets larger in minuscule increments. That's our model; the farther away something is, the smaller it appears, and the lower its relative velocity appears. So what do we do? Do we whip out trig formulae and rigorously apply them every time we need to update them on the screen? That's the idealistic approach and would give the most accurate measurement of movement. Unfortunately, most idealistic approaches don't work too well in reality. We'd need a Cray-1 to do all that as fast as we're going to need it done. So we cheat, and approximate. Remember, though, it's not called cheating; it's called ingenuity.

Now look at figure 1 again. The dotted lines represent equal distances—the "real" distance between the bottom and the first dotted line is the same as that between the first and second dotted lines, and so forth. Fans of the Amazing Maze will recall this kind of approximation to reality; it works well for us, because our binary computer is good at powers of two and fractions of the same (four, two, one, one-half, one-fourth, and so on). So let's try this to begin with: When we move a perspective line, if the distance between the edge of the screen and the first dotted line is less than halfway to the horizon, we will move it twice as far as we would if it were in the third fourth of the screen (between the first and second dotted lines), and so forth. We would then get this kind of table:

Range	Movement	Cycle
0 to 1/2	move 8 times	xxx
1/2 to 3/4	move 4 times	xx0
3/4 to 7/8	move 2 times	x00
7/8 to 15/16	move 1 time	000

When we need to move a perspective line, we check to see how far it is from the horizon and move it accordingly. But if we move the closest lines eight dots at a time, they'll jump horrendously. To avoid this, we'll move the closest lines one dot at a time and the farthest lines one-eighth of a dot at a time by keeping a cycle count going (the last binary number in the table). The first line moves on all eight cycles (000–111). The next line moves on cycles 0, 2, 4, and 6. The third line moves on cycles 0 and 4, and the last line moves only on cycle 0. Simple, huh? Let's block it out.

```
XMOVE: CYCLE = CYCLE + 1
       if CYCLE > 7 then CYCLE = 0

       for NUM = 1 to 3
        for DEPTH = 0 to 3

         if LINEX (NUM) > DIS (DEPTH)
           then MOVE.XLINE (NUM)
         if CYCLE mod 2∧(DEPTH + 1) < > 0
           then exit DEPTH loop
        next DEPTH
       next NUM

       end XMOVE
```

And it works like this.

First, we increment the cycle number to tell us what lines we'll be moving this time around. Then we check our three lines, one by one, to see where it is on the screen and if it should move or not. The first loop goes through the three lines; the second checks to see what boundaries the particular line falls on. DIS is an array with the boundaries for each segment; DIS (1) is the range zero to one-half; DIS (2) is the range one-half to three-fourths, and so forth. The Cycle mod 2∧(DEPTH + 1) checks to make sure that the rightmost Depth bits are zero; if they're not, the line won't be moved if it's at that point or beyond (examine the table and think about it).

We haven't said anything yet about the actuality of how to move the lines in which direction, how to speed up and slow down the movement, and other "practical" matters. But we haven't gotten that far yet, so patience, patience. That's all in the magical routine, MOVE.XLINE (NUM), to be discussed later.

All the Bright Moves. We have simulated one of our six degrees of freedom. Perhaps we should call it six kinds of movement, which is less technical and precise but more descriptive.

First of all, we have movement on a plane: backward and forward, left and right. That's two degrees. Then, when we go to three dimensions, we add another degree of freedom. That's three: Does that mean that for six degrees of freedom we need six dimensions? No; the other three are orientations. First, we have rolling to the left and right; that's four. Then we have pitch, nose up (climbing), and nose moves down (diving); that's five. And finally, we have yawing, where the nose moves left or right; that's six. Figure 2 illustrates all six degrees of freedom; x-movement, y-movement, z-movement, roll, pitch, and yaw.

So far, we've done x-movement. What next? Well, we'll add crossbars to hint at y-movement. For z-movement, the ground will get larger (lines will get farther apart) or smaller (lines get closer together). For roll, the horizon (and all the lines) will tilt left or right to simulate rolling right or left respectively. For pitch, the horizon line will rise on the screen, showing more ground, or descend showing less, as the nose pitches down or up. And for yaw, the perspective lines will tilt left or right without the horizon tilting to follow. Whew!

First, let's take a stab at y-movement. These crossbars will form squares on the "surface" of our planet. If we were looking straight down at the surface from a height, that's what we'd see. However, we're looking along the surface, at a very oblique angle, so the squares

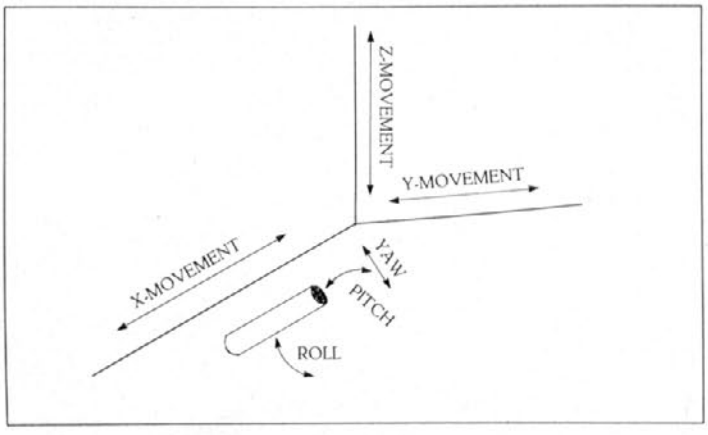


FIGURE 2.

turn into elongated trapezoids (see figure 3). Remember, though, they're still squares in reality, and that helps us to figure out how to place the crossbars and move them.

From the last section, we know that things shrink as they get farther away, and in our world twice as far means half the size. The dotted lines in figure 1 tell where things halve, and that's all we need to know, aside from the horizon y-coordinate of the crossbars, to draw said lines. First of all, we need to define the center of the horizon (marked in figure 3). Now, since the horizon is not an infinite distance away (the distance to the horizon depends on the radius of the planet and the distance the observer is above the surface—more on that next time), let's say that it's at the fifteen-sixteenths mark. So a two-dot-wide line at the horizon is the same length (on the surface of the planet; not on the CRT) as a thirty-two-dot line at the viewer point. This tells us slope, and with one point and a slope, we can draw our line. For each line, all we need to keep track of is its y-coordinate at the horizon. Then, when we move left or right, we take the change in global y-coordinates, run it through some function to tell us the shift in the screen lines, and redraw them, if needed. Simple, right?

Here's how the rough cut looks.

```
YMOVE: if YNEW - YOLD < > 0
   then
      DELTA = MAGFNC (YNEW - YOLD)
      for NUM = 0 to 5
         ERASE.YLINE (NUM)
         LINEY = LINEY + DELTA
         DRAW.YLINE (NUM)
      next NUM

   end YMOVE
```

And in English, it goes like this: First, we see if the global y-position has changed. If it has, we apply some magical function (MAGFNC) to the difference and get DELTA, which is plus or minus for moving left or right correspondingly. Then we just loop through and move each line, erasing the old line, adding DELTA, and drawing the new line.

Simple as that. Sure, because we left out all the messy, practical parts again. Getting to be a habit, isn't it? Ah, but we get places faster. See, this is the next step up from just daydreaming about the game. Once we have all this pseudocode laid out, we can translate it into machine language and add all the needed parts we're just glossing over. That's called successive refinement; it's a way of sneakily getting a lot done by tricking the mind into thinking that it's all easy because all the small modules are easy. And it works. Sometimes.

One thing it does do is point out muddy thinking quickly. Compare the XMOVE routine to the YMOVE routine. See anything different? Yes, a voice cries out, the XMOVE routine doesn't check the change in old and new global x-coordinates like the YMOVE routine checks the change in the old and new global y-coordinates. True, true. That's left to the MOVE.XLINE routine, but we can bring it out of that and put it in the loop. This will also make the speed change more evident in the code.

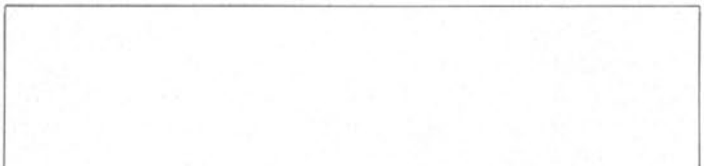


FIGURE 3.

Our modified XMOVE would look like this:

```
XMOVE: CYCLE = CYCLE + 1
   if CYCLE > 7 then CYCLE = 00

   if XNEW - XOLD < > 0 then
     DELTA = XMAGFNC (XNEW - XOLD)
     for NUM = 1 to 3
     for DEPTH = 0 to 3

       if LINEX (NUM) > DIS (DEPTH)
         then MOVE.XLINE (NUM)
       if CYCLE mod 2∧(DEPTH + 1) < > 0
         then exit DEPTH loop
      next DEPTH
    next NUM

   end XMOVE

MOVE.XLINE: ERASE.XLINE (NUM)
       LINEX = LINEX + DELTA
       DRAW.XLINE (NUM)

       end MOVE.XLINE
```

Now we have the explicit check for x-position change. Also, a new "magic" function, XMAGFNC, to get the delta change for forward or backward motion, which would be minus or plus correspondingly.

So what about z-movement? What does that entail? Well, if you move up, the horizon is farther away, but it appears to be lower. It goes from a maximum of 50 percent of the screen if you're 0 distance above the ground to 0 percent at some distance P, with P depending on the radius of the planet and the angle of vision from your craft. And what that means in practicality is that we can slough off most of the hard work of the z-move onto the x- and y-move routines by changing the x-coordinate of the horizon line and the table DIS in the XMOVE routine. That, as you might see, will, after a complete redraw, have the screen set up in the new format. To state it semiformally, we get the following:

```
ZMOVE: if ZNEW - ZOLD < > 0 then
         DELTA = ZMAGFNC (ZNEW - ZOLD)
         HORIZON.X = HORIZON.X + DELTA
         DISTNC = (MAX.X - HORIZON.X)
         for NUM = 0 to 3
          DIS (NUM) =
           HORIZON.X + DISTNC/2∧(NUM + 1)
         next NUM

         end ZMOVE.
```

Here we have yet another magic function. This one determines how much to raise or lower the horizon line on the screen; DELTA is plus or minus for increasing or decreasing altitude. Then the new horizon is computed, and the DIS table is recalculated; DIS (1) is halfway between the bottom and the horizon, DIS (2) is three-fourths of the way, and so on.

All this is fine, but what happens when a line rolls off the end in the XMOVE or YMOVE routines? How do we add new ones?

For the XMOVE, it's easy. When a line rolls off the bottom, we add one at the fifteen-sixteenths mark; when a line merges into the horizon, we add one at the bottom. Thus, we always have three and only three lines on the screen, easy to handle and move.

YMOVE is a little harder to handle. These lines don't disappear; they just get more and more parallel to the horizon. So, we need to pick some terminal value for LINEY. When it gets exceeded, we kill that line and add a new one on the other side. There'll be two limits—a low limit for the left-hand side, and a high limit for the right-hand side. Each limit is the add point for the other; if we kill a line at the low (left) side, we add at the kill limit for the high (right) side. It's essentially the same scheme as for XMOVE.

Unfortunately, there's a real problem with ZMOVE. As you get higher and higher, the horizon sinks lower and lower, but the perspective lines get closer and closer because those surface squares are getting smaller and smaller in apparent size. That means we need more and more lines in the area, messing up our prettiness. As you get very high, the curvature of the planet becomes more apparent as well, as an ever-increasing arc of the planet is subtended (a trig class vocabulary word) and the perspective lines become curved as well.

What does that mean? It means that we'll put that off for the time being. (We'll put it on the back burner so that it can cook for a while; half-baked ideas are dangerous.) But think about it. And don't shirk; think about it. Pretend that I'm not going to answer it. See if you can come up with a better solution than mine; prizes probably won't be awarded, but you could get congrats for cleverness.

Blithely ignoring the other three degrees of freedom for now, because they're a real pain, what about reality? How is all of this going to look in 6502 assembly language? Sorry to disappoint you, but this is going to be a test. We're withholding the actual code until the beginning of next issue's article so that you can work on this without being tempted to cheat. In a moment, some crib notes, but first another note on the Virtues of Hard Work.

Free Lunch Served Here. The point of this series of articles is to try to help people in writing an arcade game by providing a running commentary from someone not entirely unfamiliar with the process. But the whole thing's no good unless you move right along, working at least as hard as yours truly. If you don't do this, you'll end up knowing how to write this game but not how to write your own. Of course, if you're just browsing, or you already have some skills of your own and are looking for techniques, you won't have to work so hard. But there are those out there, somewhere (not too long ago I was one of them), who clamor for information like this.

Enough of that. Now for the crib notes. First of all, the magic functions. Don't work very hard on these, because this is where most of our successive refinement will be applied. Just do the simplest thing possible, which is a 1 or − 1 for XLINE and a 1, 0, or − 1 for YLINE (think about that one for a while).

The simplest way to do 2∧N for small integer Ns is to use a look-up table. A calculation of 2∧N would look like:

```
TAX     ;N in accumulator, put in X for indexing
LDA POWER2,X     ;get 2∧N
RTS

POWER2 byt 01,02,04,08,10,20,40,80
where POWER2 is a list of 2∧0 through 2∧7.
```

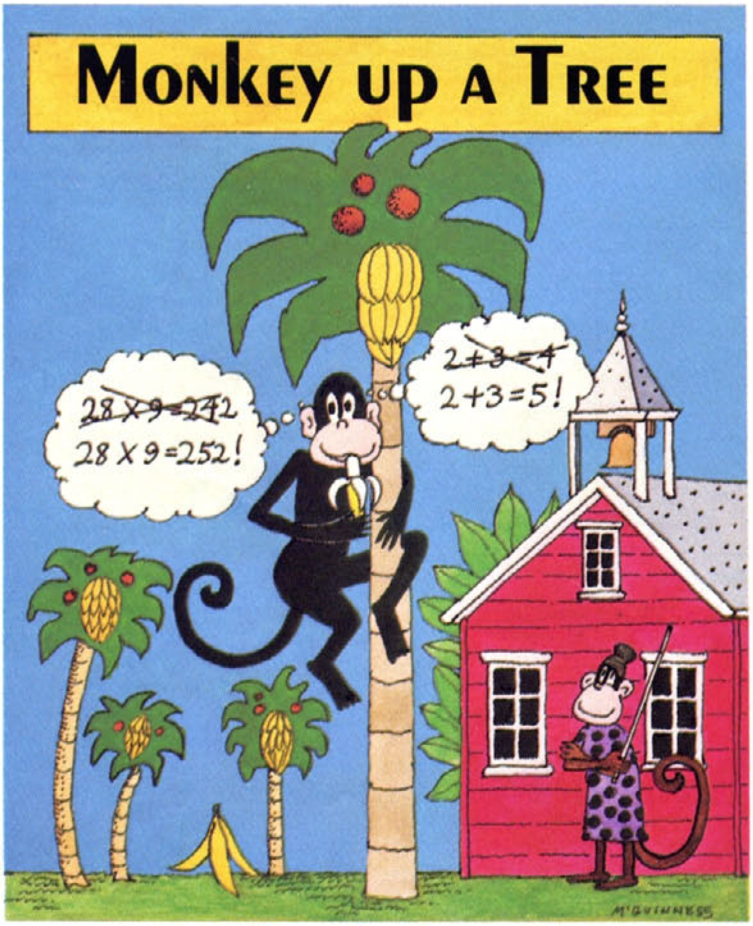
Start off your initial conditions as simply as possible, but try to pick initial conditions that fit with the algorithms presented—that is, lines at one-half, three-fourths, seven-eighths for XMOVE, say. For YMOVE, think about how things move and where the lines should start out.

The DIS table should be obvious; look at how the ZMOVE routine calculates the new DIS table if you get lost.

Line drawing routines: Here's the real nitty of the gritty. The ERASE.XLINE and DRAW.XLINE should be obvious enough, but the y counterparts need some thinking about. Don't forget that you may need to clip the y lines as they get more and more parallel to the horizon. Examine all relevant pictures and figures, and draw more of your own; the answer isn't that hard. And don't worry about ZMOVE for now; more information will be forthcoming on that next time, when we dust off the final three degrees of freedom (and what headaches those will bring).

You have your homework; it's optional but highly recommended. After all, how else will you know if you have the Write Stuff? And don't be discouraged; the talent you're trying to develop is, in large part, due to the environment, and environment you'll get plenty of in these and future pages.

See you in sixty.



MIND AND THE GAME

IT'S A SHAME TO CALL INTELLIGENCE LIKE THIS ARTIFICIAL

BY MIKE FERRIS

Artificial intelligence has become the Holy Grail of computer science since British A.I. pioneer Alan Turing asked the question, "Can machines think?" in a 1950 issue of *Mind* journal. In his article, titled "Computing Machines and Intelligence," Turing introduced an imitation game, now known as the Turing Test. The game's objective was for an interrogator to determine, through written queries, which of two people was a man and which was a woman.

While the Turing Test is as simple as playing What's my Line?, the exercise is complicated by the possibility that one of the players is actually a computer. Could the interrogator be fooled?

Maybe not thirty-four years ago. But today? Certainly.

Serious work on the subject of thinking machines and smart programming has gone from the humble academic domain of computer scientists to the front page of many a newspaper since Japan announced its goal of creating the fifth generation of computers in the next ten years.

A.I. is hot. It's sexy. It could change the world. And to think it started with a simple guessing game. The first chess-playing simulation, called *Turochamp*, was also created (on paper) by Turing, who was an avid chess player.

Games have always been a part of A.I. research "because they're very simple," says Professor Jaime Carbonell of Carnegie-Mellon University. "The machine doesn't have to explain how it arrived at a move. You don't have to solve that problem to make it good at games, and no serious consequences will befall the computer if it happens to be wrong. It will just lose the game."

Getting Smart. Artificial intelligence is not about supercomputer Frankensteins that can rule the world or cry like real people. Even if a smart computer gets stepped on, you won't hear it shouting "computers' rights!"

Artificial intelligence isn't even about computers. It's about us—how we think, and how, when that process is understood, it can be simulated. Granted, computers are the best study tools we've ever invented, but they are still only tools.

They can play a mean game, however, appearing at times to be diabolically skilled adversaries, especially in chess. Certain microcomputer games even seem to give computers the talk, walk, and smile we call personality. Certain companies are promising games that "possess characteristics of human intelligence." Sounds like artificial intelligence, doesn't it?

Well, it is—and it isn't.

One of the ironies of A.I. research is the discovery that tasks like the mastery of chess and the solving of equations are easier to replicate than things like driving a car.

A.I. researchers realized early in the fifties that "trying to implement even simple models of human thought is far more difficult than we thought." A.I. researcher Carbonell explains, "It's amazing how complex and interesting the human mind really is." As you study it, "you gain a much higher respect for human thought processes."

The computer's weakness in this area is that we can take mundane tasks for granted and a computer can't. Learning to drive is actually a very complicated task, but once learned it becomes "automatic" to us. We don't introspect on how we do it when we're doing it. Chess, on the other hand, is a very specialized discipline where knowledge and other past experiences don't come into play. Because it's so specialized, involving finite sets of rules and decisions, it's easier to get a computer to do it. "Even then," says Carbonell, "it has taken tens of years to arrive at good chess-playing programs."

Hey Gang! Let's Make It into a Game! It would be disappointing to find out that the human brain doesn't work like a computer after all, just as we previously came to realize that it doesn't work like a steam engine. A.I. is like a mirror of ourselves, and what we're seeing right now is how confusing and complicated we really are.

It seems only natural, then, that concepts of artificial intelligence would eventually show up in computer games, either by design, inspiration, or coincidence.

Oh, it's not the real thing, of course. "It would be presumptuous to use the term artificial intelligence for the primitive algorithms used in games," says Atari game designer Chris Crawford. "What we use is extremely clever, sneaky code—nowhere near as grandiose as A.I. programs we see running at research centers."

To Crawford, "artificial intelligence is big, hairy stuff running on big, hairy computers." In the forefront of A.I. research, this is true. An example of this mainframe muscle is Bell Labs's chess champ *Belle*, with a library of 350,000 standard opening positions. *Belle* can also examine a whopping 130,000 positions per second.

Any programmer will tell you that what you play against in computer games is only a distant third cousin to true A.I. It's more a process of artificial reckoning, where certain game programs make calculated guesses that seem humanlike—or that reveal what Crawford calls "artificial personality."

A growing number of computer games exhibit variations of this delightful semantic trickery. The best example is probably Dave Mullich's *Prisoner 2* from EduWare, a graphic adventure that's also, according to its author, a satire of computer games. In it, you are looking to escape from an island prison, and your main adversary is the Caretaker, who attempts to curb any expression of freedom or individuality.

"What gives it the illusion of artificial intelligence," says programmer Mullich, "is the very large number of responses the program's parser can make. Most adventures use the parser for implementing movement and information commands. In *Prisoner 2* it's used solely for simulating person-to-person dialogs, and all the effort went into that."

In your keyboard conversation with him, "the words and phrases of the Caretaker give you the impression that he's in control, slightly condescending, and paternalistic," Mullich explains. "He's smiling down at you, knowing he has all the answers; not giving much away. All the responses play with you and tease you."

In another building on the island, a conversation with a priest, in contrast, "is more comforting than your exchange with the Caretaker. The priest makes you feel at ease," says Mullich. "He's more sympathetic in his responses." The personality of the priest may be more benign, but he must also adhere to the scenario of the game, not wanting you to get off the island either.

Two things inspired Mullich to create *Prisoner 2* when he was working his way through college as a salesman in a computer store. "First I decided how to win the game in a clever and symbolic way. There was also a program around at the time called *Eliza*. I wanted to put some of what it had into the game."

The Shrink That Wouldn't Die. *Eliza* is the most notorious piece of programming to come from artificial intelligence research. An experiment in conversational programming, it was created in 1966 by Professor Joseph Weizenbaum, a computer scientist at M.I.T. who has since disowned the program. (Versions of *Eliza* are currently available for all major personal computers from Artificial Intelligence Research.)

Very simply, *Eliza* plays the role of an objective analyst in a mock psychiatric session with a patient, played by the user. What Weizenbaum found disturbing was the fact that fellow computer scientists would say, "Yes, the machine understood me" after a session with the program. Say what?

Weizenbaum disliked the notion of people becoming so attached to computers, and so willing to humanize them. When the idea of *Eliza*-type computerized psychiatry "just wouldn't die," Weizenbaum threw in the towel. To this day, he's still sour on the subject, complaining of the "holding power" and "grip" of electronic machines on the imagination.

It's *Eliza*'s parser that allows the program to search for noun and verb combinations, enabling it to come up with its seemingly natural responses. Parsers from the original *Adventure* days could accept only one- and two-word commands. They're much more receptive now, largely due to advances made at Infocom, home of text adventures like the Zork trilogy, *Planetfall*, *Deadline*, and *Infidel*.

Programmer Marc Blank began working on more powerful parsers in 1977 as part of a group of M.I.T. graduates. According to *Time*, they used "programming techniques developed at the university's artificial intelligence laboratory" and "added adjectives, prepositions, and compound verbs" to the parser's vocabulary, allowing full sentences to be entered and understood. Well, that's what *Time* says.

"The approach we take with a game is not just in the parser," explains Blank. "It's all over. The games are entirely data- and instruction-driven instead of relying on hard coding and combinations of words that happen to work.

"You set up something that defines the structure of the language and have tables and all sorts of data structures that describe types of things. It was that style of thinking that led us to make the parser the way we did. It's not a rigorous application of any A.I. technique. It's more a compromise between what kind of sentence you want to do and which kind of structure you need."

Calling the process "structured data abstraction," Blank explains: "It's not completely streamlined and elegant, but very data-intensive,"

CELLS & CIRCUITS

Computers can only do two things: calculate and sort. When you get a computer "to replicate the rational aspects of human thinking, getting it to behave in a sort of human way," that's artificial intelligence, explains Professor Jaime Carbonell, adding, "It's the opposite of natural stupidity."

Carbonell, a noted computer scientist in A.I. research at Carnegie-Mellon University, has been working in the field for ten years now and "will continue for a long time to come." His work has two thrusts: natural language processing and machine learning.

Natural languages involve the creation of interfaces to databases, expert systems, and other software, so noncomputer types can use them. Machine learning is "trying to get computers to acquire new information from, say, an expert in a domain, or getting it to notice its mistakes from a performance in the past," says Carbonell.

Academic research into methods of programming to achieve artificial intelligence is also called A.I. "It's the union of knowledge and achieving goals," says Carbonell. "These goals can be the solution of a problem or what to do next in a state of affairs you want to see happen."

Some A.I. research using such languages as Lisp, Pop-2, and Fuzzy involves the creation of algorithms, or sets of rules, that simulate brain functions.

How does the brain function?

Theories abound.

While computer scientists are trying to program computers to "think" like we do, in a parallel discipline neurologists are studying the neural cells in the brain.

"Neurologists are working at a lower level of detail, trying to understand physiochemical pathways, rather than working on the logic of reasoning processes encompassing tens of millions of cells," explains Carbonell. "But it's a complete red herring right now," to those in the A.I. business, until the composite behavior of all neurons is known.

How do brain cells function?

Theories abound.

Intelligence, both real and artificial, is a speculative business.

with little programming involved. The Infocom parser is not a full-blown English parser, but rather "intended to understand a limited subset of positions for the types of games we do."

Chess-playing computers run a loose version of expert system programs. Since a doctor doesn't have to trust a diagnosis to one, such programs don't have to justify how they came to a particular conclusion. Most of them depend on the brute force search method when looking for good moves. Certain tree-pruning techniques, used to narrow down choices, are also used.

These techniques are what "everybody in A.I. learns early," says Carbonell. "These are the simple areas." Small-scale versions of these beginning algorithms can be found in the *Chess, Checkers,* and *Go* packages from Odesta.

"While nowhere near as sophisticated as the A.I. implementations of these techniques," says *Checkers* author David Slate, "the Odesta series does use alpha-beta tree searching, minimaxing, and iteration to search for the best moves more efficiently."

To whit: The potential number of moves a chess program could consider is astronomical without some kind of programming restraint. Iteration is a progressive deepening routine that searches until a criterion for not going any deeper is reached. Minimaxing picks a move based on the best score possible. An alpha-beta tree search looks ahead and evaluates how much of a tree can be thrown away.

"Of course," explains Slate, "the memory limitation on micros severely limits their use." Slate is currently caretaker of *Nuchess,* a master-level chess-playing program created at Northwestern University.

A Winning Personality. In the realm of strategic and tactical games, Chris Crawford is making advances in the art of imbuing games with personality. *Eastern Front, Legionnaire,* and *Excalibur,* three of his games for the Atari, show his personal evolution in the field.

Right off, Crawford states, "I don't use any academic A.I. techniques. I improvise my own. Artificial intelligence implies an objective correctness, and most games aren't gigantic exercises in logic—they're participatory fantasy revolving around human beings. This is why you have to have artificial beings in there somewhere."

Crawford has devised a number of special-purpose algorithms to model aspects of human behavior in the three games mentioned. "The programming is simple," he says. "It's the algorithms that are tough." The simplest one to explain is in *Excalibur,* a knights-of-the-round-table strategy where the player is King Arthur.

Crawford drew upon problems in solid-state physics and factoring analysis to create it. "I wanted to show how people in a group form cliques," he explains, "how they tend to adjust their responses to each other, form complicated inner relationships, and react to each other differently."

In explaining the algorithms used, Crawford connects the knights by imaginary coils. "Each individual in the game is connected to every other by a spring. The closer they are socially, the shorter the spring. The less they like each other, the longer. The group comes to an equilibrium by adjusting themselves individually to different situations.

"Arthur's relationship with the knights is what keeps them loyal. As you can see, there's a lot of stress in this system because the character's behavior is pulled this way and that by the programming." The complex oscillations of this technique make the knights seem like jealous, ambitious, or idealistic warriors.

The tactical war game *Eastern Front* helped Crawford polish his concept of artificial reckoning—the micro version of A.I. "It's the closest I've gotten to traditional A.I., except the program in this game looks for a better move, not the best.

"It's not quite a tree search. It's more a matter of a huge point system where points are given for things like occupying a city and killing bad guys. The program considers advantages and selects."

The game that bridges the gap between the reckoning used in *Eastern Front* and the full-blown personality displayed in *Excalibur* is Crawford's real-time, Romans-versus-barbarians strategy, *Legionnaire.*

"The units make good moves and analyze the way to go, as in *Eastern Front,*" Crawford explains, "plus the game takes into account the personality factor. Each man has a different trait—he may be bold, courageous, cowardly, or show leadership ability.

"Players can spend time worrying about 'excitable' Crassius, for example. They may want to pull him back or risk him losing his courage and running away." This went on to become the group of dynamics of *Excalibur.*

Similar advances in giving strategy games a sense of personality are exhibited in *Incunabula,* a multiplayer game soon to be released for the IBM PC, by Stephan Estavik of Expert Systems.

The game begins with seven players, and the computer picks up those roles not chosen by live players. The game chronicles the rise of civilization, "beginning with the capture of territory," says Estavik. "But the game actually fosters cooperation, not competition. You can trade with and cooperate with your neighbors, trying to become civilized."

Estavik built "attitudes" into *Incunabula* based on medieval concepts of personality. "Players can choose to be choleric," he says, "and never ally with somebody better; sanguine, in wanting to win and not caring how; or melancholic—always wanting to finish in the top three."

These personality traits manifest themselves in the overall strategy of a player. "There are several recursive tree search routines built into the game that decide how the computer will respond, based on your choices of attitude," says Estavik. All these factors give the impression of character in a player's role. "Certain players will stab you in the back, break alliances, or demand tribute instead of attacking."

Once again, "there's nothing fancy in the programming," says Estavik. "The aspect of artificial intelligence comes in at the level of program design."

Let's Run It Up the Flagpole, Drop It, and See If It Bounces. These ambitious but primitive attempts at introducing artificial personality into a computer game borrow concepts from and mimic the results of artificial intelligence discoveries to date. What about the future? Right now, the politics of A.I. itself are changing.

The next big developments will come from Japan, where researchers are attempting to create the Godzilla of the next decade—the fifth-generation computer system. This is artificial intelligence with a vengeance.

Operating with a budget of more than $450 million, the Ministry of International Trade and Industry (MITI) has ambitiously announced what it calls an "instant institute" of forty "young and excellent" researchers from participating firms. The goal of the group is to design and produce the software and hardware for the "knowledge information processing" of tomorrow. They hope to create the first smart computer, well beyond what we are working with today.

The new breed of Japanese computers, according to Feigenbaum and McCorduck's *The Fifth Generation,* will go one step beyond by creating new hardware and software for the three subsystems and a new way to interface geared to speeding up the passing of information between them. It will standardize the processes of smart computer systems, making them more commercially viable.

Dramatic improvements in hardware and software will have to be made to accomplish this. Can it be done?

Theories abound.

It's a bold and risky venture, but if they pull it off they'll have a monster in the marketplace of the 1990s.

Before anybody had a clear grasp of what artificial intelligence was, the Japanese took a development in the field and ran with it. A.I. is not a purely academic issue anymore; it's competitive knowledge engineering. It's also the biggest game in town.

"It's the best thing that could have happened to artificial intelligence," says Carbonell. "Now the government and companies are finally taking it seriously. Even if the Japanese get nowhere, it will serve as a boon here. Sort of a mini version of the Sputnik race."

Which will undoubtedly lead to the creation of better games.

"A game is a less cognitive experience than a business application," says Atari designer Crawford. "It's less formal, less explicit, and more natural"—all requirements that game designers keep striving to meet. Any future advances in A.I., American or Japanese, will make games seem more human, personable, and playable than they are now.

NO TIPPING

Adventurers are invited to respond to the pleas of the stumped listed herein and to solicit aid in return. In addition to this reader-supplied public service, any tip submitted in response to a Typified that the editors judge to be extraordinarily trenchant, to the point, and terrific will be rewarded with a $100 bounty. Include your idea of the straightforward solution along with each masterpiece of literary or cryptographic subtlety. This is not optional.

Try to limit yourself to a maximum of five questions and five tips apiece, or mix and match for a total of no more than ten. We ask this favor of you, gentle reader, because the volume of mail is now such that we couldn't print all requests/assists if No Tipping were twice its current size. Therefore, we strive instead to give something like equal representation to all who write. (A single tip that takes up a full page or more is likely to be neither prized nor printed.)

Remember to state the name of the game and the question to which you are responding.

Certain questions regarding certain adventures have a high rate of recurrence and will be recirculated in the Typifieds from time to time. By all means, keep answering them. The classic adventures are like busy turnstiles. They are always new to new adventurers, and certain areas of high frustration will always produce the same requests. If your tip didn't make it to print or to riches when the question was first asked, hang on to it, rework it, and improve it. The question may come up again.

Final note: Poems win bounties when they have some bearing, in their entirety, on the clue being given—not because they make pretty rhymes.

Address all correspondence to Softline Tip, Box 60, North Hollywood, CA 91603. Really.

Postmark deadline: February 8, 1984.

January bounty winners:

SAGA #10: Savage Island 1—How do I open the coconuts or get the bear to drink the salt water?

And the winner is:

Here's a tip from the Pacific:
Coconuts, although prolific
Have no use, you know,
Except, perhaps (in caves), to throw.
To help you tame the bear,
Here is some helpful fare;
The thing that you've debated
Would be better dehydrated.
—David Williamson, Honolulu, HI

SAGA #1: Adventureland—How do I get the blue ox out of the swamp?

And the winner is:

"Say, what's that on my toe?"
"Don't axe me."
—Steven Savage, Perrysburg, OH

The Quest—What is the answer to the riddle of the sphinx?

And the winner is:

In long, poetic riddles, the purpose is often masked;
So I inquire of you, what is truly asked?
—Tom Molina, Beaumont, TX

TYPIFIEDS

Adventure

q. How do I open the north door of the giant room?—Reid Yamashiro, Santa Ana, CA

q. How do I get out of the maze? How do I go through the passage leading out of the plover room? Help!—Tom Schloemer, Pepper Pike, OH

Cranston Manor

q. How do you get rid of the suit of armor so you can pick things up?—Wade Hoelter, Piedmont, CA

q. Stuck in the computer room; how do I activate the computer?—Walter Sturm, Oceanside, CA

Cyborg

a. *Finding the permanent power pack:* Isaac Asimov + Rolaids = solution.—Peter T. Clark, Sacramento, CA

Dark Crystal

q. Where is Aughra? What does the babbling brook mean?—Larry Fisher, Miller Place, NY

Deadline

a. The connection of the ladder to the murder: Gardeners can make matters somewhat rosier.—Jerry Valenti, Thorndale, PA

Death in the Caribbean

q. How do you get the sword past the ghost?—Steve Bumgardner, Kansas City, MO

Enchanter

q. I'd like to know how to get the Kulcad spell from the machine room, as well as how to enter the eastern hall without being caught. No easy hints, and no poetry puh-leeze! ("What light through yonder window breaks? 'Tis the east, and if you go E-N-E-E, you'll get to the sun.") I can't wait to read a hint-haiku.—Roger Carlson, New Britain, CT

Escape from Rungistan

a. *How to ski:* Lean on me; dead bears know Polish.—Edward C. Floden, Jr., Hanover Park, IL

q. Can't get past the cannibals, find matches, or find a gas can. Am getting desperate.—Blake Craighead, Rock Hill, SC

Kabul Spy

a. *Crossing the bridge:* It's a draw-bridge. Be artistic.—Peter Rabbit, U.S. Military Training Mission, Saudi Arabia

q. How do I find Hirsin in the devil's den?—Richard Garrett, Pittsburgh, PA

Knight of Diamonds

q. Have all the stuff, solved the riddle; how do I get the staff?—Reid Yamashiro, Santa Ana, CA

Mad Venture

a. *Handling the Mad Adder and getting out of the room:* Once you've come BACK from the adder's lair, it's wise not to forget the old adage, "Never kill a snake with your fingers!"—Lisa Oerman, Muscatine, IA

Mystery House

a. *Having killed the killer, can't find the treasure:* You'll need to see through the algae.—Theodore Chen, Potomac, MD. Are you sure you killed the real killer? Set your spy glass on that, and be sure you remember you have to go out to get into the top rung killing.—Linda Anderson and Chris Rogers, Burbank, CA

Prisoner 2

q. How do you get through the second physical fitness course? Where do you find the stuff that enables you to unlock doors?—Shawn Smith, Greendale, WI

SAGA #3: Mission Impossible

a. *What to do with the bomb:* To complete your deed./A pail you shall need.—Greg Lyke, Castro Valley, CA

SAGA #5: The Count

q. How do you make it through the night and keep the stake?—Shaun Miller, Tacoma, WA

q. How do you go down the dumbwaiter?—Reid Yamashiro, Santa Ana, CA

SAGA #9: Ghost Town

q. How do I put the horseshoe on Ol' Paint, and how do I ride him?—Jr. Anderson, Glenview, IL

q. What do you use the gunpowder for? How do you open the cell door in the jail?—Steve Moody, Houston, TX

SAGA #10: Savage Island I

q. How do I get to the cave below the ledge outside the volcano?—Reid Yamashiro, Santa Ana, CA

Serpent's Star

a. *Getting a lantern:* Talk to a person whom you might know/And he will give you a light./To get into dark caves of snow, you will need this idea bright.—Moss Corey, North Miami Beach, FL

q. What do you need to buy from the merchants?—Bob Enna, Huntington Beach, CA

q. How the ---- do you get past the door with the six dents in it after the maze?—Se-wai Lee, Dallas, TX

Starcross

a. *Finding the silver rod:* What color are the rays the first time you shoot the gun?—Peter Meyer, Carmel Valley, CA

a. *Finding the crystal rod:* It will indeed shed more (and better) light on the final solution; have you ever observed that a prism is clear?—Robert Yuan, Fountain Valley, CA

q. How do I get the blue rod from the sphere? What is the piece of visor for?—Douglas Blair, Alexandria, VA

Suspended

a. *Getting the cutting tool off the shelf; repairing robots:* Simpler machines succeed where complex ones fail. Position is the key in climbing or getting higher mechanisms. The sub is the source of the simpler one.—W. Turner, Milwaukee, WI

a. *Repairing Iris:* O learned sage master, answer my query, you airhead! Rhymers feel up brains.—David Goldfarb, Berkeley, CA

q. How do you balance the ICs? Replaced the nine-inch cable but it doesn't seem to work. What will the cutting tool cut?—David Goldfarb, Berkeley, CA

Time Zone

a. *Relighting your torch:* To light the torch you must go/To the makers of Datsun, you know./And when you get there/You'll find, if aware,/A sulfur-tipped stick with a glow.—Monty Kosma, Valencia, CA

q. How do I manage not to freeze in Antarctica? What's in Australia? Is there any reason for being there at all?—Craig Wilberg, Oak Lawn, IL

Ultima II

a. *What to do with the ring:* In a castle of time untrue/The ring allows passage through.—Kai Kenner, McLean, VA

q. How do you get the items needed for traveling in the rocket? How do you get the blue tassels needed for boarding frigates? And how do you raise character attribute points?!—Kai Kenner, McLean, VA

Ultima III

q. How do I raise my magic point level above 15? Where do I find exotic arms? How can I get past the silver snake?—David Schmitz, Country Club Hills, IL

Ulysses and the Golden Fleece

a. *Getting across the fjord in the underground tunnel:* Do as Daedalus and Icarus did.—Shawn Smith, Greendale, WI

a. *Getting past the wall of fire after Pluto:* Quit your wineing. You might get wet.—John Valenti, Livonia, MI

Wizard and the Princess

a. *Getting out of the desert and past the chasm:* Crossing the chasm may make your back break/But don't feel down and blue:/If the two notes gave you a splitting headache/Why don't you try some glue?—Marty Folz, Evansville, IN

Wizardry

a. *Hey, Laurel Goulding: How did you take your characters to the tenth level?:* Hey, Larry Fisher! If your answer was a hint, thanks, but if it was a question, I went to level D and fought my way to "authorized user"-hood.—Laurel Goulding, Grosse Ile, MI

q. Is there a way to get back the amulet and possessions after you kill Werdna? What use is the gold key? Or the bronze one?—Graham C. Smith, San Antonio, TX

ZORKTALK

January bounties:

Zork I—How to get past the bat.

And the winner is:

I ate krug, a colt.

—Laurel Goulding, Grosse Ile, MI

Zork I—Where is the cyclops?

And the winner is:

Behind the place that is intentionally left blank lies a passage that connects to the answer.

—Pat Henn, Foster City, CA

GENERAL PLEAS AND ASSISTANCE

I

Help wanted. George Eliades (Nashua, NH) wants to know how to catch the songbird. Larry Fisher (Miller Place, NY) can neither get the platinum bar out of the loud room or cross the rainbow by the Aragain Falls. Queries Robert Bowdish (Solvang, CA), "How do you get past the narrow passage in the timber room to the drafty room and the machine room and be able to see? And where is the brass bauble?" Is there any way of getting Nick Heesters (Newark, DE) up the ramp in the cellar or into the coal mine? How about getting David Goldfarb (Berkeley, CA) through the crack in the damp cave? Or Rob Carter (Athens, GA) past the granite wall in the temple, where he's been stuck for over a year?

Help granted. For those of you having aquatic difficulties, George Eliades (Nashua, NH) recommends, "Now you know what the boat is, try to do to a certain object what you do to get a genie." Adds Mike Blanchard (New Bedford, MA), "What do you use to inflate a tire?" On getting past the gas room intact, with torch, Mr. Blanchard notes, "There is a basket in the shaft room . . ." and then we had to gag him.

How to kill the thief? "With age comes experience," opines Peter T. Clark (Sacramento, CA). On using the machine, "The machine is a gem," states Roger Carlson (New Britain, CT), "but it was naughty so don't give it anything for Christmas." Moreover, "You can't bring anything into the drafty room. Your stuff must arrive ten moves before you do."

To turn off the noise in the loud room and get the platinum bar, Nancy Fong (San Francisco, CA) sagely suggests: "Say what you hear."

II

Help wanted. George Eliades (Nashua, NH) is pondering how he can get the portrait without having to make a deposit. Can he get deposited stuff back? What can he get in the circular room? John Kight (Dallas, TX) "gave the portrait to a certain gnome" and now he wants it back.

Douglas Blair (Alexandria, VA) and a lot of other folks would like to know how to get into the vault. He would also like to know how to get the violin to play. And what about the baby sea serpent? Patricia B. Smith's (New York, NY) is one more voice raised in query regarding the passing of dragons and the catching of unicorns. Wade Hoelter (Piedmont, CA) would like to know what the writing on the wall in the circular room means.

Help granted. Ever-helpful Peter T. Clark (Sacramento, CA) chimes in on two matters of weight: On getting past the dragon, he agrees with Yosemite Sam that "dragons is *soooo* stewpid." To get more out of the situation, C.M. Patterson (Union City, CA) suggests, "Fence with the beast to get the beauty."

III

Help wanted. Triple-threat George Eliades (Nashua, NH) wants to know how to open the chest, how to get out of the multicolored panel room, or what to do when going back in time to the beginning of the museum. He could probably be of some help to Mike Blanchard (New Bedford, MA), who would like to know how to travel through time—also how to use the machines and get out of the manhole. Is there any way David Goldfarb (Berkeley, CA) can get out of the royal puzzle without losing the book? Nancy Fong (San Francisco, CA), expressing no wish to get past the guardians, just "can't figure out the significance of the vial and its invisible contents." Hmm. She also wonders what the wooden staff is for.

Help granted. To open that bronze door, Roger Carlson (New Britain, CT) suggests one open it "from the other side. Go in when it is opened, wait for it to have been closed (did we all read *Restaurant at the End of the Universe*?), and then open it."

LET'S SEE SOME ACTION!

by DERRICK BANG!

Historically, the arrangement of sounds and/or symbols into patterns to facilitate the transmission of information and to convey meaning or intent has been one of the most important occupations of the human race. After the development of the Indo-European, the Romance, and the dead languages, however, there was a lag of a few hundred years when no one was coming up with anything new. Today, the search for alternative ways to communicate—that most human of endeavors—goes on with renewed vigor as a means of achieving faster, better, more efficient relations with our newest pal, the computer. We're going to take a look at one such alternative.

Action!—with an exclamation point as part of its name—is a new language for the Atari. The cartridge design is quite clever. Its 16K ROM is bank-selected so that it resembles an 8K cartridge to the system. The user therefore retains more system memory. Aside from the obvious design work, its author, Clinton Parker, justifies the cost this way: "Action!," he claims, "is the most sophisticated cartridge ever marketed, with the possible exception of Atari's Telelink 2."

It's certainly one of the heaviest, at least twice the weight of a normal cartridge. This makes it easy to imagine that the density comes from all the information crammed into it.

Parker feels that Action! would be preferable to Basic as Atari's onboard language, although he realizes that his opinion isn't shared by the folks at Atari: "Action! is better for beginners than Basic. I hate Basic with a passion, because it allows so many bad programming techniques. It's the first language kids see when they get home computers, and these kids get ruined as programmers. By the time they hit an advanced language, in school or whatever, they're writing programs using bad habits. These need to be unlearned, but people get frustrated and lose interest; then we all lose somebody who might have been a good programmer."

Whatever Parker's intentions, novice users would find it pretty difficult to jump into Action! as a first language. Its 200-page instruction manual is short on sample programs and does not adequately explain the importance of proper syntax. There is no index, and all chapter headings and descriptions are printed with the same tiny typeface. The combination makes it almost impossible to find a particular piece of information.

On the other hand, the manual is written with a much lighter touch than usual in such endeavors, so reading it is not the arduous task that might be assumed from its length. Discussing loops and the counters that increment them, the writer cheerfully points out that "manipulating the counter within its own loop can lead to very interesting results, some of which might be useful."

Action! also demands precision. Whereas Atari Basic's print command covers a multitude of statement types, Action!'s equivalent has sixteen variations, ranging from print to printIDE. Format decisions are based on whether the data is a string, a byte, a cardinal (two-byte, positive number), or an integer (two-byte, positive or negative number).

Parker's distaste for Basic pops up here and there in the form of editorial bias. When discussing the concept of nested program statements, for example, the manual promises that "quite a bit" can be accomplished by those who understand the method. "Knowing what you're doing," the manual continues, "doesn't take too much time, because the concept of nesting is universal to all structured statements." For a first-time programmer, that's not much help.

On the other hand, those familiar with Basic will have a sizable advantage. Despite his disapproval, Parker acknowledges the comfort that most users enjoy with Basic. "I wanted a system as easy as Basic for user interaction. The library built into the Action! cartridge supports all Basic functions, with the exception of language-related commands—such as run, stop, and end—or transcendental functions, such as sine and cosine. The latter are lost because Action! doesn't correctly support real, or floating-point, numbers."

Programmers usually "think" in the language they first learn. (English speakers studying Spanish in school, for example, mentally translate a Spanish question into English, think of an answer in English, translate that, and then say the answer in Spanish.) As a result, those who make the jump from Basic to assembly language often conceptualize a program in Basic and then translate it into assembly.

Action! users are spared the task of seeking assembly language subroutines for Basic commands, because the cartridge library includes almost seventy subroutines that can be called during programming. Several are structurally identical to Atari Basic commands. "Many commands are similar," Parker explains. "A Basic command of graphics 8 would be an Action! procedure call of graphics (8)."

Such similarities end with the commands, however. Action! uses a compiler much the same way as the Atari *Assembler Editor* cartridge. "Action! is a structural language, like Pascal, so statement *types* differ. Basic relies on goto for almost everything. Action! has no goto; it uses *groups* of procedures, and statements with nested substatements." This reflects Parker's original design goals: "I wanted a high-level language with a compiler and the speed of assembly language. There really weren't any others available for the Atari."

Action! also introduces new verbs useful in conditional cases: *else*, *elseif*, *while*, and *until*. The first two often appear together when the results of a single operation could send the program to any of several destinations:

```
IF X>8 THEN...
ELSEIF X>7 THEN...
ELSEIF X>6 THEN...
ELSE...
```

While keeps the program in a loop while a particular parameter is true, and until keeps the program in or out until the parameter *becomes* true.

Take the following Basic program, which plays a guessing game with the user:

```
10  NUMBER = INT (RND(NUMBER)*100)
20  PRINT "I'm thinking of a number from 0 to 100."
25  PRINT "Can you guess what it is?"
30  INPUT GUESS
40  IF GUESS<NUMBER THEN PRINT "That's too low":GOTO 30
50  IF GUESS>NUMBER THEN PRINT "That's too high":GOTO 30
60  "You got it! Good job!"
70  END
```

An equivalent Action! program would look like this:

```
PROC guessing( )

  BYTE num,
         guess = [200]

  PrintE("I'm thinking of a number from 0 to 100.")
  PrintE("Can you guess what it is?")
  num = Rand(101)
  WHILE guess< >num
    DO
    PrintE("What's your guess? ")
    guess = InputB( )
    If guess<num THEN
      PrintE("That's too low.")
    ELSEIF guess>num THEN
      PrintE("That's too high.")
    ELSE
      PrintE("You got it! Good job!")
  FI
  OD
RETURN
```

FI and OD, respectively, indicate the conclusion of guess testing and the while loop.

One handy feature of Action! is its capacity for split-screen editing. The screen can be divided into two sections of variable width, and different portions of a program can be examined and manipulated at the same time. This is quite useful when tracing the results of a particular program statement.

It also offers an attraction for programmers tired of shuttling back and forth from Atari's Basic and *Assembler Editor* cartridges. "In small programs, you can go directly to the editor and type your program, just as you would in Basic," Parker explains. "Then you go to the Monitor, type in *compile*, and the program will be compiled in a second or two. Typing *run* will then execute the program. If something doesn't work right, you can go back to the editor, make a change, immediately return to the compiler, run the program, and see the difference. Variable values can be set or queried in the Monitor, along with other things normally done in Basic's immediate mode."

The final results are quite impressive. "Action! runs about a hundred times faster than Basic, and roughly two to three times slower than assembly language. The code density is about two to three times larger than a corresponding assembly program.

"I'm very happy with the result. I'd buy it even if I hadn't written it," comments Parker.

Fellow programmer Jerry White regards Parker, who just finished a dissertation for his doctorate in computer science, as a "programming genius," and in many ways Parker lives up to that description. Most noticeable, however, is the unbridled enthusiasm with which he discusses anything related to computers and programming.

"Clinton developed Action! because he hates to write in assembler," White recalls. "He didn't like Basic, because it's too slow and unstructured, and there isn't a good C or Pascal for the Atari. He decided to write his own Pascal-like language, but better than it has been done before. Initially, I didn't see much money in it, which didn't bother him; he said he was doing it for himself. Of course, that changed."

Parker warms quickly to the subject: "Action! is targeted for people who want to program on their Ataris, not for professional software development. It can handle production software, such as games, but that wasn't my intention. A million people own the machines, but there are only a couple of hundred professional software writers.

"Most of the initial orders, however, came from software development houses."

Action! clearly lives up to the image suggested by its name. And like most good titles, it was not the first one considered. "When I first gave the language to OSS, I called it AMPLE: A Micro-Processor LanguagE. They wanted a better marketing name. They finally came up with Action!, which was derived from my company name, Action Computer Services. I originally came up with that because, back when I did consulting work and thought I'd be listed in the Yellow Pages, I wanted to be near the front."

Nor was OSS the only market considered. Parker made the obvious first choice, with results that should surprise no one. "Atari would not even consider Action! as a product to sell. I feel they will only accept products that have already proven successful . . . popular arcade games, for example."

Whatever the marketing problems, Action! already has its staunch supporters. Last year, Jerry White wrote the following in a letter to the Professional Atari Programmers Information Exchange: "In my . . . opinion, Action! is the most exciting new software development tool ever developed for the Atari computer."

While less effusive, a comment from Jack Palevich (author of the *Deep Blue C Compiler*) is equally encouraging: "In general, C doesn't work very well on a 6502, because a 6502 lacks a 16-bit stack pointer, 16-bit registers, et cetera. I've pretty much given up on C, and I am currently looking at a language called Action! . . . [which is], in essence, a nonrecursive C, which means it runs extremely fast on a 6502."

With the immediate credibility provided by PAPIE's roster of programming movers and shakers, Action! may turn into the next sliced bread of the Atari software market. Although Parker is more cautious in his hopes for success (Action! is not, after all, a ready-to-run package such as *VisiCalc*), he is already looking toward future markets.

"I just started work on a Commodore 64 version," he says, with one of his characteristic chuckles. "You never know."

Optimized System Software, 10379 Lansdale Avenue, Cupertino, CA 95014; (408) 446-3099. $99.

SOFTLINE

PROGRAMS IN PULP

Special Throwaway Section for Nonprogrammers

ADVENTURES IN ADVENTURING

Eutheria reviewed the program as follows: "Not as complicated an adventure as I'd like, as it doesn't seem to do anything. All I can seem to do is pick up and drop the turtle. But it does work on my Timex. . . ."

```
>LIST
10 CALL -936
20 GOTO 2080
30 PRINT "RESTORE PREVIOUS GAME?":
40 INPUT A$
50 IF A$ = "YES" THEN GOTO 1880
60 REM PARSER STARTS HERE
70 Y = O
80 X = 0
90 V1$ = ""
100 N1$ = ""
110 PRINT
120 PRINT
130 PRINT
140 PRINT "WHAT NOW? ";
150 INPUT A$
160 IF LEN(A$) = 0 THEN GOTO 60
170 FOR A = 1 TO LEN(A$)
180 IF A$(A,A) = " " THEN V1$ = A$(1,A-1)
190 IF A$(A,A) = " " THEN X = 1
200 IF A$(A,A) = " " THEN X = 1
210 IF X = 1 THEN N1$ = A$(A + 1, LEN(A$))
220 IF X = 1 THEN A = 0
230 IF X = 1 THEN GOTO 260
240 NEXT A
250 V1$ = A$
260 X = 0
270 REM NEXT TWO LINES GET RID OF DIRECTION PREFIX
280 IF N1$ = W1$ OR N1$ = W2$ OR N1$ = W3$ OR N1$ = W4$ OR
    N1$ = W5$ OR N1$ = W6$ OR N1$ = W7$ OR N1$ = W8$ OR
    N1$ = W9$ THEN V1$ = N1$
290 IF N1$ = W10$ OR N1$ = W11$ OR N1$ = W12$ THEN V1$ = N1$
300 REM VERB HANDLING ROUTINES
310 REM NEXT TWO LINES CHECK FOR MOVEMENT
320 IF V1$ = W1$ OR V1$ = W2$ OR V1$ = W3$ OR V1$ = W4$ OR
    V1$ = W5$ OR V1$ = W6$ OR V1$ = W7$ OR
     V1$ = W8$ THEN GOTO 500
330 IF V1$ = W9$ OR V1$ = W10$ OR V1$ = W11$ OR V1$ = W12$ THEN
    GOTO 500
340 REM LOOKING AND READING
350 IF V1$ = W23$ OR V1$ = W24$ OR V1$ = W27$ THEN Y = 1
360 IF Y = 1 THEN PRINT
370 IF Y = 1 THEN GOTO 1200
380 REM GETTING THINGS
390 IF V1$ = W19$ OR V1$ = W20$ THEN Y = 1
400 IF Y = 1 THEN PRINT
410 IF Y = 1 THEN GOTO 1270
420 REM DROPPING THINGS
430 IF V1$ = W21$ THEN GOTO 1440
440 REM INVENTORY ROUTINES
450 IF V1$ = W16$ OR V1$ = W17$ OR V1$ = W18$ THEN GOTO 1560
460 REM QUITTING
470 IF V1$ = W14$ THEN GOTO 1630
480 REM SAVING GAME
490 IF V1$ = W13$ THEN GOTO 1710
500 REM MOVING AROUND ROUTINES
510 X = R
520 IF V1$ = W1$ OR V1$ = W7$ THEN R = N(R)
530 IF V1$ = W2$ OR V1$ = W8$ THEN R = S(R)
540 IF V1$ = W3$ OR V1$ = W9$ THEN R = E(R)
550 IF V1$ = W4$ OR V1$ = W10$ THEN R = W(R)
560 IF V1$ = W5$ OR V1$ = W11$ THEN R = U(R)
570 IF V1$ = W6$ OR V1$ = W12$ THEN R = D(R)
580 IF R>0 THEN X = R
590 IF R>0 THEN CALL -936
600 IF R>0 THEN GOTO 680
610 IF R = 0 THEN Y = 1
620 IF Y = 1 THEN PRINT
630 IF Y = 1 THEN PRINT "YOU CAN'T MOVE THAT WAY...NOW!!!"
640 IF Y = 1 THEN R = X
650 IF Y = 1 THEN X = 0
660 IF Y = 1 THEN GOTO 60
670 IF WO = 1 THEN RD(R) = 0: REM RESET LONG DESCRIPTION
680 IF R = 1 THEN GOSUB 840
690 IF R = 2 THEN GOSUB 900
700 IF R = 3 THEN GOSUB 960
710 IF R = 4 THEN GOSUB 1020
720 IF R = 5 THEN GOSUB 1090
730 IF R = 6 THEN GOSUB 1150
740 REM LISTING OF OBJECTS ROUTINE
750 PRINT
760 PRINT "OBJECTS HERE ARE: "
770 PRINT
780 X = R
790 GOSUB 2000
800 X = 0
810 GOTO 60
820 REM END OF LISTING OBJECTS ROUTINE
830 REM ROOM DESCRIPTIONS
840 PRINT "YOU ARE AT THE BASE OF HIGH CLIFF"
850 IF RD(R) = 1 THEN RETURN
860 PRINT
870 PRINT "THERE IS A SIGN CARVED IN THE CLIFF."
880 RD(R) = 1
890 RETURN
900 PRINT "YOU ARE AT THE BASE OF A CLIFF"
910 IF RD(R) = 1 THEN RETURN
920 PRINT
930 PRINT "THERE IS A WEB HERE THAT WEIGHS A TON. IT IS A
    CLIFF-TON WEB."
940 RD(R) = 1
950 RETURN
960 PRINT "YOU ARE AT THE BASE OF A CLIFF"
970 IF RD(R) = 1 THEN RETURN
980 PRINT
990 PRINT "YOU MIGHT BE ABLE TO START CLIMBING HERE."
```

```
1000 RD(R) = 1
1010 RETURN
1020 PRINT "YOU ARE AT THE BASE OF A CLIFF."
1030 PRINT
1040 PRINT "THE ROCKS ARE PRECARIOUSLY          BALANCED."
1050 PRINT
1060 PRINT "I WOULD TIPTOE OUT AND NOT RETURN"
1070 CL = 1
1080 RETURN
1090 PRINT "YOU ARE AT THE BASE OF A CLIFF"
1100 IF RD(R) = 1 THEN RETURN
1110 PRINT
1120 PRINT "AT ONE TIME THEY THREW A BALL HERE. IT WAS A
     BASE-BALL."
1130 RD(R) = 1
1140 RETURN
1150 PRINT "YOU ARE AT THE BASE OF A CLIFF"
1160 IF RD(R) = 1 THEN RETURN
1170 PRINT
1180 PRINT "YOU MIGHT BE ABLE TO START CLIMBING HERE."
1190 RD(R) = 1
1200 REM LOOK, DESCRIBE, READ ROUTINES
1210 Y = 0
1220 IF R = 1 AND N1$ = W27$ THEN PRINT "IT READS, 'HI, CLIFF!' "
1230 IF R = 1 AND N1$ = W29$ THEN PRINT "IT READS, 'HI, CLIFF!' "
1240 PRINT
1250 GOTO 60
1260 REM END OF LOOK ROUTINE
1270 REM GETTING ROUTINES
1280 IF N1$ = "" THEN PRINT "YOU FORGOT TO ENTER A NOUN"
1290 IF N1$ = "" THEN PRINT "YOU FORGOT TO ENTER A NOUN"
1300 IF N1$ = "" THEN GOTO 60
1310 REM NOW GO TO CHECK IF NOUN MEANS ANYTHING
1320 GOSUB 1970
1330 IF OB(X) = 91 THEN PRINT "YOU'VE ALREADY GOT THE ";N1$;"."
1340 IF OB(X) = 91 THEN GOTO 60
1350 IF OB(X) = R THEN OB(X) = 91
1360 IF OB(X) = 91 THEN PRINT "OKAY, YOU HAVE THE ";N1$
1370 IF OB(X) = 91 THEN PRINT
1380 IF OB(X) = 91 THEN GOTO 60
1390 PRINT
1400 PRINT "THERE IS NO ";N1$;" HERE."
1410 PRINT
1420 GOTO 60
1430 REM END OF GETTING ROUTINE
1440 REM DROPPING ROUTINES
1450 IF N1$ = "" THEN PRINT "YOU FORGOT TO ENTER A NOUN"
1460 IF N1$ = "" THEN GOTO 60
1470 GOSUB 1970
1480 IF OB(X) = 91 THEN GOTO 1520
1490 PRINT
1500 PRINT "YOU'RE NOT CARRYING THE ";N1$;"."
1510 GOTO 60
1520 OB(X) = R
1530 PRINT
1540 PRINT "YOU'VE DROPPED THE ";N1$;"."
1550 GOTO 60
1560 REM INVENTORY ROUTINES
1570 X = 91
1580 PRINT
1590 PRINT "YOU ARE CARRYING:"
1600 PRINT
1610 GOSUB 2000
1620 GOTO 60
1630 REM QUITTING
1640 PRINT
1650 PRINT "DO YOU WANT TO SAVE THIS GAME? ";
1660 INPUT A$
1670 IF A$ = "YES" THEN GOTO 1710
1680 CALL -936
1690 PRINT "FARE THEE WELL"
1700 END
1710 REM SAVING GAMES ROUTINE
1720 REM THIS IS FOR THE APPLE
1730 REM BUT ALL YOU HAVE TO DO
1740 REM IS SAVE THE VARIABLE SHOWN
1750 REM IN LINES 6180 TO 6190
1760 REM WITHIN QUOTES IS A CONTROL D
1770 PRINT "";"OPEN EASYFILE"
1780 PRINT "";"WRITE EASYFILE"
1790 PRINT R
1800 PRINT OB(1)
1810 PRINT "";"CLOSE EASYFILE"
1820 PRINT
1830 PRINT "DO YOU WANT TO CONTINUE PLAYING?";
1840 INPUT A$
1850 IF A$ = "YES" THEN CALL -936
1860 IF A$ = "YES" THEN GOTO 500
1870 GOTO 1690
1880 REM RESTORING GAMES ROUTINE
1890 REM THIS IS FOR THE APPLE
1900 REM THE QUOTES BELOW CONTAIN A CNTRL D
1910 PRINT "";"OPEN EASYFILE"
1920 PRINT "";"READ EASYFILE"
1930 INPUT R
1940 INPUT OB(1)
1950 PRINT "";"CLOSE EASYFILE"
1960 GOTO 500
1970 REM SUBROUTINE TO CHECK NOUNS
1980 IF N1$ = "TURTLE" THEN X = 1
1990 RETURN
2000 REM SUBROUTINE TO PRINT OUT INVENTORY OF OBJECT IN
     ROOM
2010 IF X = OB(1) THEN PRINT "A TURTLE"
2020 IF X = OB(1) THEN Y = 1
2030 IF Y = 0 THEN PRINT "NOTHING"
2040 PRINT
2050 Y = 0
2060 RETURN
2070 END
2080 REM SET UP ROUTINES
2090 DIM N(90),S(90),E(90),W(90),U(90),D(90),X(4),Y(4),RD(90),OB(20)
2100 DIM A$(20),V1$(20),N1$(20),W1$(5),W2$(5),W3$(4),W4$(4),W5$(2),
     W6$(4),W7$(1),W8$(1),W9$(1),W10$(1),W11$(1)
2110 DIM W12$(1),W13$(4),W14$(4),W15$(4),W16$(1),W17$(3),
     W18$(9),W19$(3),W20$(4),W21$(4),W22$(4),W23$(4),D$(5)
2120 DIM W24$(8),W25$(7),W26$(5),W27$(4),W28$(4)
2130 OB(1) = 2
2140 FOR A = 1 TO 6
2150 RD(A) = 0
2160 NEXT A
2170 REM DIRECTION LOADING
2180 FOR A = 1 TO 6
2190 N(A) = 0
2200 S(A) = 0
2210 E(A) = 0
2220 W(A) = 0
2230 U(A) = 0
2240 D(A) = 0
2250 NEXT A
2260 N(1) = 4
2270 E(1) = 2
2280 N(2) = 5
2290 E(2) = 3
2300 W(2) = 1
2310 N(3) = 6
2320 W(3) = 2
2330 S(4) = 1
2340 E(4) = 5
2350 S(5) = 2
2360 E(5) = 6
2370 W(5) = 4
2380 S(6) = 3
2390 W(6) = 5
2400 REM WORD LIST
2410 W1$ = "NORTH"
2420 W2$ = "SOUTH"
2430 W3$ = "EAST"
2440 W4$ = "WEST"
2450 W5$ = "UP"
2460 W6$ = "DOWN"
2470 W7$ = "N"
2480 W8$ = "S"
2490 W9$ = "E"
2500 W10$ = "W"
2510 W11$ = "U"
2520 W12$ = "D"
2530 W13$ = "SAVE"
```

```
2540 W14$ - "QUIT"
2550 W15$ - "READ"
2560 W16$ - "I"
2570 W17$ - "INV"
2580 W18$ - "INVENTORY"
2590 W19$ - "GET"
2600 W20$ - "TAKE"
2610 W21$ - "DROP"
2620 W22$ - "WAIT"
2630 W23$ - "LOOK"
2640 W24$ - "DESCRIBE"
2650 W25$ - "RESTORE"
2660 W26$ - "CLIFF"
2670 W27$ - "READ"
2680 W28$ - "SIGN"
2690 REM SETTING FLAGS
2700 R - 1
2710 Y - 0
2720 X - 0
2730 GOSUB 830
2740 PRINT
2750 PRINT
2760 GOTO 30
2770 END
```

DUNGEON FUN LEVEL THREE

```
1 REM
2 REM          THE DUNGEON MACHINE
3 REM
4 REM                V: 3.9
5 REM
6 REM               COMBAT
7 REM              MOVEMENT
8 REM           SPECIAL EVENTS
9 REM
10 REM
50 GOTO 5000: REM INITIALIZE

100 REM + + + EACH ROUND + + +
110 REM ** NEW PAGE **
115 REM ENTER W/ CUR JUST BELOW LAST LINE TO BE RETAINED
120 CV - PEEK (37)
130 CALL - 958: GOSUB 1240
140 FOR X - 1 TO CV - 18
150 CALL - 912: NEXT X
160 FOR X - 0 TO 1:ENERGY(X) - ENERGY(X) + 15
170 IF ENERGY(X) > 100 THEN ENERGY(X) - 100
180 NEXT X

200 REM ** PRINT STATUS **
210 HTAB 1: VTAB 1: PRINT ST$
220 CALL - 868: PRINT NAME$;
230 HTAB 8: PRINT PROF$;
240 HTAB 11: PRINT HEALTH(1);
250 HTAB 18: PRINT ENERGY(1);
255 HTAB 25: PRINT GOLD;
260 HTAB 31: PRINT HP;
270 HTAB 36: PRINT EP
280 CALL - 868

300 REM ** PROMPT & INPUT **
310 GOSUB 1240: REM PAUSE
320 VTAB 21: CALL - 958
330 PRINT P$;:CH - PEEK (36)
340 PRINT : PRINT : GOSUB 1240
350 PRINT O$(DOING);
360 GOSUB 1240
370 VTAB 21: POKE 36,CH + 2
380 GET Q$: REM
400 REM ** DECODE & BRANCH **
410 Q - ASC (Q$)
420 IF Q - 27 THEN END
430 HTAB 1: CALL - 958
440 IF SQ%(VS,LS,0) < >4 THEN M4 - 0
450 ON DOING GOTO 900,2000
460 GOTO 4000: REM
800 REM ** AN ENCOUNTER? **
810 IF SAFE * RND (5) >1 THEN 100: REM NO ENCOUNTER (5160)
820 DOING - 1
830 PRINT : PRINT I$E$
840 GOTO 100: REM
900 REM ** RUN OR FIGHT? **
904 IF Q - 70 THEN 960
906 IF Q < >82 THEN 1300
910 IF RND (6) < .5 THEN 950
920 PRINT I$"YOU GOT AWAY, THIS TIME!": PRINT : GOSUB 1230
930 ENERGY(1) - INT (ENERGY(1) / 2):D - INT (3 * RND (7))
935 HS - INT (3 * RND (7)):VS - INT (3 * RND (7))
940 DOING - 0: GOTO 4500
950 PRINT I$"NO GOOD — HE'S TOO CLOSE!"
960 PRINT : PRINT I$"HE'S A FIGHTER, ABOUT YOUR"
970 PRINT I$"    SIZE, AND WITH SIMILAR
980 PRINT I$"    EQUIPMENT. GOOD LUCK!"
990 PRINT :DOING - 2: GOTO 1900: REM

1000 REM + + + UTILITIES + + +
1010 REM ** RANDOM MOD **
1015 REM ENTER WITH RIN PRESET
1020 SIGN - 1 - 2 * ( RND (7) < 0.5)
1030 RO - INT (RIN * RND (6) ∧ 2) + 1
1040 RO - SIGN * RO / 2
1050 RETURN
1200 REM ** DELAY TIMER **
1210 GOSUB 1220: REM 16 CYCLES
1220 GOSUB 1230: REM  8 CYCLES
1230 GOSUB 1240: REM  4 CYCLES
1240 GOSUB 1250: REM  2 CYCLES
1250 FOR T - 1 TO TIME
1260 NEXT T: RETURN
1270 PRINT DAM$(HIT( NOT W))

1300 REM ** BAD INPUT **
1310 POKE 36.CH + 2: PRINT Q$
1320 GOSUB 1340: VTAB 20
1330 CALL - 958: GOTO 200
1340 GOSUB 1240: GOSUB 1350
1350 GOSUB 1240: VTAB 23
1360 PRINT Z$O$(DOING);: HTAB 1
1370 GOSUB 1230: CALL - 998: CALL - 958
1380 RETURN

1400 REM ** ADVANCE VWPT **
1410 HL - HS:VL - VS
1420 IF D - 0 THEN VL - VL + 1
1430 IF D - 1 THEN HL - HL + 1
1440 IF D - 2 THEN VL - VL - 1
1450 IF D - 3 THEN HL - HL - 1
1470 RETURN : REM
1900 REM ** NEW OPPONENT **
1910 HEALTH(0) - 100
1920 ENERGY(0) - 100
1930 AC(0) - 100
1940 DC(0) - 100
1950 DEAD - 0:F1 - 1
1960 GOTO 100
1990 REM

2000 REM + + + FIGHT! + + +
2010 REM ** INPUTS **
2020 IN(0) - INT ( RND (5) * SQR (1.3 * EN(0))) + 1
2025 IF IN(0) > 9 THEN IN(0) - 9
2030 IN(1) - VAL (Q$)
2040 IF IN(1) - 0 THEN 3000
```

```
2045 F1 = 0
2050 IF IN(1) ∧ 2 * 2 / 3 <ENERGY(1) THEN 2100
2060 PRINT I$Z$"YOU'RE TOO TIRED.";
2070 GOSUB 1220: HTAB 1
2080 CALL - 868: GOTO 200

2100 REM ** THE ATTACKS **
2103 PRINT I$"YOUR INPUT:";
2105 PRINT IN(1)"   HIS:"IN(0);
2110 GOSUB 2500: REM SET UP
2113 PRINT "    HIS EN:"EN(0)
2115 PRINT I$"YR AK:"AI(1)" DF:"DI(1);
2117 PRINT "    HIS AK:"AI(0)" DF:"DI(0)
2130 GOSUB 2600: REM ATK & DEF
2140 GOSUB 2800: REM DAMAGE
2150 GOSUB 2900: REM REPORT
2180 IF NOT DEAD THEN 100

2200 REM ** IN CASE OF DEATH **
2210 HOME : HTAB 8: VTAB 10
2220 IF HE(1) < 1 THEN PRINT "OOPS! TOO BAD....": HTAB 20: END
2230 PRINT "CONGRATULATIONS!"
2240 HTAB 10: VTAB 14
2250 PRINT "YOU GOT HIM!"
2260 GOSUB 1220:DOING = 0
2270 PRINT : PRINT : PRINT
2280 IF L2 THEN 10350: REM
2300 REM ** LOOT! **
2310 GP = 0:LT = 0
2320 LT = INT (7 * RND (7)) - 3: IF LT < 0 THEN LT = 0
2330 GP = GP + INT (10 * RND (7)) + 2
2340 PRINT I$"HE WAS CARRYING "GP" GOLD PIECES";
2350 IF NOT LT THEN PRINT ".": GOTO 2370
2360 PRINT ",": PRINT : PRINT I$" ";
2365 PRINT "AND "LT" ENERGY PILLS."
2370 PRINT : PRINT : PRINT
2380 GOLD = GOLD + GP:EP = EP + LT
2390 GOSUB 1220: GOTO 4500: REM
2500 REM ** SET UP ATTACKS **
2510 W = 0: GOSUB 2530
2520 W = NOT W
2530 VIT(W) = INT ((EN(W) + HE(W)) / 2)
2540 EN(W) = EN(W) - INT (IN(W) ∧ 2 * 2 / 3)
2550 IN = IN(W) - 1
2560 AI(W) = INT (IN / 3)
2570 DI(W) = IN - 3 * AI(W)
2590 RETURN : REM
2600 REM ** COMPUTE ATTACKS **
2610 GOSUB 2630
2620 W = NOT W
2630 AI = (AI(W) + 3) / 4: IF AI < 1 THEN AI = 0:EN(W) = EN(W) + 7
2640 DI = (DI( NOT W) + 3) / 4
2643 WHO$ = "HIS": IF W THEN WHO$ = "YOUR"
2645 PRINT I$WHO$" ATK "AI;
2647 PRINT "    AGAINST "DI
2650 RIN = AI * VIT(W) * AC(W) / 100
2655 PRINT I$" RIN = "RIN;
2660 GOSUB 1000:RO = RIN + RO
2665 PRINT " RO = "RO;
2670 HIT = RO - DI * VIT( NOT W) * AC( NOT W) / 100
2680 PRINT ": HIT = "HIT" ";
2710 IF HIT < 1 THEN HIT(W) = 0: GOTO 2750
2720 IF HIT < 15 THEN HIT(W) = 1: GOTO 2750
2730 IF HIT < 50 THEN HIT(W) = 2: GOTO 2750
2740 HIT(W) = 4
2750 REM
2755 INVERSE : PRINT HIT(W): NORMAL
2760 RETURN : REM
2800 REM ** DAMAGE **
2810 GOSUB 2830
2820 W = NOT W
2830 DAM = HIT(W) * INT (10 * RND (5) + 1) + 10 * (HIT(W) - 1)
2840 IF DAM < 0 THEN DAM = 0
2850 HE( NOT W) = HE( NOT W) - DAM
2860 IF HE( NOT W) < 1 THEN DEAD = 1
2870 RETURN : REM
2900 REM ** REPORT **
2910 W = 0
2920 GOSUB 2940
```

```
2930 W = NOT W
2940 PRINT : PRINT I$;
2950 IF NOT HIT( NOT W) THEN PRINT LEFT$ (HIT$(W),4);: GOTO 2970
2960 PRINT HIT$(W);
2970 PRINT DAM$(HIT( NOT W))
2990 RETURN : REM
3000 REM ** HEAL & ENERG. **
3010 IF Q = 81 THEN DOING = 0: PRINT I$"COWARD!": GOTO 100
3015 IF Q = 47 OR Q = 63 THEN 8000: REM INFORMATION
3020 IF Q <  > 69 AND Q <  > 72 THEN 1300
3030 FIX = HE(1):USE = HP
3040 IF Q = 69 THEN FIX = EN(1):USE = EP
3050 IF USE = 0 THEN 3130
3060 USE = USE - 1
3070 FIX = FIX + 30 + INT (40 * RND (5)): IF FIX > 100 THEN
     FIX = 100
3080 IF Q = 69 THEN EN(1) = FIX:EP = USE
3090 IF Q = 72 THEN HE(1) = FIX:HP = USE
3100 IN(1) = 3: GOTO 2100
3130 PRINT I$Z$"SORRY — NONE LEFT.": PRINT : GOTO 3100
3190 REM

4000 REM + + + MOVEMENT + + +
4010 REM ** DISTRIBUTE **
4020 SP = 0
4030 IF Q = 76 THEN 4300: REM    LOOK
4040 IF Q = 8 OR Q = 21 THEN 4400: REM TURN
4050 IF Q = 68 THEN 4200: REM    ROOM DESCRIPTION
4060 IF Q = 67 THEN 4800: REM     COMPASS
4065 IF Q = 47 OR Q = 63 THEN 8000: REM   INFORMATION
4070 IF Q = 69 THEN 4700: REM    EXAMINE
4080 IF Q <> 32 THEN 1300

4100 REM ** FORWARD **
4110 IF FO% = 1 OR FO% = 3 THEN 1300: REM   CAN'T DO THAT
4120 IF FO% = 2 THEN RD = 0: REM  NEW ROOM, DESCRIBE IT
4130 GOSUB 1400
4140 HS = HL:VS = VL
4150 A = 1:E1 = 1
4155 IF SQ%(VS,HS,3) = 3 AND T2 THEN 20700
4157 IF SQ%(VS,HS,3) = 6 AND T1 THEN 20300
4160 IF RD THEN 4500
4170 IF SQ%(VS,HS,0) = 4 AND D = 0 THEN 10100
4180 IF SQ%(VS,HS,0) = 2 THEN 10200
4190 REM
4200 REM ** ROOM DESCRIPTION **
4220 FOR X = 1 TO 4
4230 PRINT I$RM$(SQ%(VS,HS,0),X)
4240 NEXT X
4250 PRINT :RD = 1
4260 GOTO 4500
4290 REM
4300 REM ** LOOK AHEAD **
4310 IF FO% = 1 THEN 1300
4320 IF FO% = 3 THEN 1300
4330 GOSUB 1400
4340 A = 0: GOTO 4520
4350 GOTO 4520

4400 REM ** TURN **
4405 A = 1:E1 = 1
4410 IF Q = 8 THEN 4450: REM  (LEFT TURN)
4420 D = D + 1: IF D > 3 THEN D = D - 4
4430 GOTO 4500
4450 D = D - 1: IF D < 0 THEN D = D + 4

4500 REM ** WHERE YOU ARE **
4505 IF NOT RD THEN 4200
4510 HL = HS:VL = VS
4520 VX = VL + 1: IF VX = 3 THEN VX = 0
4530 HX = HL + 1: IF HX = 3 THEN HX = 0
4540 WT%(0) = SQ%(VX,HL,1)
4545 WT%(1) = SQ%(VL,HX,2)
4550 WT%(2) = SQ%(VL,HL,1)
4555 WT%(3) = SQ%(VL,HL,2)
4560 HX = D - 1: IF HX = - 1 THEN HX = 3
4565 LT% = WT%(HX)
4570 HX = D + 1: IF HX = 4 THEN HX = 0
4575 RT% = WT%(HX)
```

```
4580 FT% - WT%(D)
4585 IF A - 1 THEN FO% - FT%

4600 REM ** WHAT YOU SEE **
4610 PRINT I$VT$(A)VW$(FT%);
4620 PRINT VZ$(FT% < 2)
4630 IF LT% <  > FT% THEN 4670
4640 IF RT% <  > LT% THEN 4660
4650 PRINT I$" AND ON EITHER SIDE.": GOTO 100
4660 IF LT% - 0 THEN PRINT I$" THE SAME ON YOUR LEFT, AND":
     GOTO 4680
4665 PRINT I$" ANOTHER ON YOUR LEFT, AND": GOTO 4680
4670 PRINT I$" "VW$(LT%)" ON YOUR LEFT, AND"
4680 PRINT I$" "VW$(RT%)" TO THE RIGHT."
4685 IF SQ%(VS,HS,3) - 6 AND T1 THEN 20400
4690 GOTO 800: REM
4700 REM ** EXAMINE **
4710 IF SQ%(VS,HS,3) - 2 AND D - 2 THEN 20100
4720 IF SQ%(VS,HS,3) - 6 AND D <  > 2 THEN 20900
4730 REM (MATCH & SEND #3)
4740 REM (ETC.)
4750 GOSUB 1220: PRINT I$;
4760 IF E1 THEN PRINT "YOU SEE NOTHING UNUSUAL.": GOTO 4780
4770 PRINT "STILL NOTHING UNUSUAL."
4780 E1 - 0: GOSUB 1240
4790 GOTO 100: REM
4800 REM ** COMPASS **
4830 PRINT I$"FACING    ";
4840 GOSUB 1230: PRINT DIR$(D);
4850 PRINT "      V:"VS" H:"HS;
4860 PRINT "    SQ:"SQ%(VS,HS,3)
4870 GOSUB 1220: GOTO 800
4900 REM

5000 REM + + + INITIALIZE + + +
5010 REM ** START PROLOG **
5020 I$ - "     ": REM 5 SPACES
5030 HOME
5060 PRINT I$"YOUR FIGHTER, ON THIS TRIP, IS": PRINT
5070 PRINT I$"JOE, A MALE HUMAN OF AVERAGE": PRINT
5080 PRINT I$"SIZE AND CAPABILITIES.": PRINT : PRINT : PRINT
5090 REM — CONTINUED AT 5500
5100 REM ** VARIABLES **
5110 DOING - 0
5120 GOLD - 0:E1 - 1
5130 EP - INT (6 * RND (5)) + 2
5140 HP - INT (4 * RND (5)) + 1
5150 EQ - EP:HQ - HP
5160 SAFE - 7: REM SEE 810
5170 TIME - 60
5180 WALL - 0

5200 REM ** STRINGS **
5210 NAME$ - "JOE":PROF$ - "F"
5230 Z$ - CHR$ (7)
5250 E$ - "SOMEONE IS COMING!"
5260 P$ - "WHAT WILL YOU DO NOW?"
5270 ST$ - "NAME    PR HEALTH ENERGY GOLD HEAL ENERGZ"

5300 REM ** STRING ARRAYS **
5330 DIM O$(2)
5340 Q$ - "SP:FWD ->:RT    C:COMPASS    D:ROOM DESCR"
5350 Q$ - Q$ + "  " + "?:INFO <-:LT E:EXAMINE L:LOOK AHEAD"
5360 O$(0) - Q$
5370 O$(1) - "F:FIGHT    R:RUN"
5380 O$(2) - "1-9:FIGHT    H:HEAL    E:ENERGIZE    ?:INFO"

5400 REM ** COMBAT SPECS **
5410 DIM HEALTH(1): DIM ENERGY(1): DIM VIT(1): DIM IN(1)
5420 DIM AC(1): DIM AI(1): DIM DC(1): DIM DI(1)
5450 HEALTH(1) - 100:AC(1) - 100
5460 ENERGY(1) - 100:DC(1) - 100

5500 REM ** MORE PROLOG **
5510 GOSUB 1220: REM PAUSE
5520 GOSUB 9100: REM COMBAT CHT
5580 PRINT I$"    (ANY KEY TO CONTINUE)": PRINT
5590 HTAB 20: GET Q$: PRINT : REM
5600 REM ** INTRODUCTION **
5610 PRINT
5620 FOR X - 1 TO 6
5630 READ Q$: PRINT I$Q$
5640 GOSUB 1220: PRINT : NEXT X
5660 DATA "JOE, YOU ARE IN AN ISOLATED","GROUP OF ROOMS,
     SOMEWHERE","UNDERGROUND. THE WALLS ARE","OF NATIVE
     STONE, REINFORCED","WITH AGE-BLACKENED TIMBERS.",
     "IT'S CHILLY DOWN HERE!"
5670 GOSUB 1210

5700 REM ** COMBAT STRINGS **
5710 DIM HIT$(1): DIM DAM$(4)
5720 HIT$(0) - "YOU HIT HIM!    "
5730 HIT$(1) - " HE HIT YOU!    "
5740 FOR X - 0 TO 4
5750 READ DAM$(X): NEXT X
5760 DATA "MISSED.","ONLY A SCRATCH.","MODERATE DAMAGE.",
     "","SERIOUS DAMAGE!"
5770 DIM LT$(1)
5780 LT$(0) - "ENERGY PILLS!"
5790 LT$(1) - "HEALING POTIONS!": REM
5800 REM ** MOVEMENT STRINGS **
5810 DIM DIR$(3): DIM VT$(1)
5820 DIM VW$(4): DIM VZ$(1)
5830 VT$(0) - "YOU SEE ":VT$(1) - "THERE IS "
5840 FOR X - 0 TO 3
5850 READ DIR$(X): READ VW$(X)
5860 NEXT X
5870 DATA NORTH,NOTHING,EAST,A WALL,SOUTH,AN
      OPEN DOOR,WEST,A CLOSED DOOR
5880 VZ$(0) - " AHEAD. ":VZ$(1) - " IN FRONT OF YOU. "
5890 DIM WT%(3)
5990 REM

6000 REM + + + THE ROOMS + + +
6010 REM ** SETUP **
6015 REM RM IS NUMBER OF CURRENT ROOM < SQ%(VS,HS,0) >,
     RD IS FLAG: 0 IF NOT DESCRIBED YET.

6100 REM ** PARAMETERS **
6110 DIM SQ%(2,2,3): REM 3 × 3 WITH 4 FILES
6120 DIM RM$(4,4): REM 4 ROOMS

6200 REM ** ROOM NUMBERS **
6210 FOR V - 0 TO 2: FOR H - 0 TO 2
6220 READ SQ%(V,H,0): NEXT H,V
6240 DATA 1,1,2,3,4,4,3,4,4

6300 REM ** WALLS **
6310 FOR V - 0 TO 2: FOR H - 0 TO 2
6320 READ SQ%(V,H,1): NEXT H,V
6330 DATA 1,1,1,2,2,1,0,0,0
6340 REM
6350 FOR V - 0 TO 2: FOR H - 0 TO 2
6360 READ SQ%(V,H,2): NEXT H,V
6370 DATA 1,0,2,1,1,0,1,1,0

6400 REM ** SPECIAL SQUARES **
6410 FOR V - 0 TO 2: FOR H - 0 TO 2
6420 READ SQ%(V,H,3): NEXT H,V
6430 DATA 0,1,2,3,4,5,6,7,8

6500 REM ** RM DESCRIPTIONS **
6510 FOR ROOM - 1 TO 4: FOR LINE - 1 TO 4
6520 READ RM$(ROOM,LINE): NEXT LINE,ROOM
6530 DATA "YOU ARE IN A SHORT HALLWAY.","TWENTY FEET
     LONG BY TEN WIDE.","THERE IS A DOOR AT THE END,
     AND","TWO DOORS ON ONE SIDE."
6540 DATA "A BOX OF A ROOM, TEN","FEET SQUARE. THERE
     IS","ONLY ONE DOOR, AND NO","FURNITURE."
6550 DATA "ANOTHER SHORT HALL, SHAPED LIKE","THE LAST
     ONE, BUT AT A RIGHT","ANGLE TO IT. THERE IS A DOOR",
     "AT ONE END."
6560 DATA "A LARGE ROOM.","TWENTY FEET SQUARE.", "THERE
     IS ONLY ONE","DOOR."
6960 REM
6970 D - 1: REM FACING EAST
6980 A - 1: REM 'THERE IS'
6990 GOTO 4200
```

```
7990 REM

8000 REM + + + INFORMATION + + +
8010 GOSUB 9100: REM COMBT CHT
8020 PRINT : PRINT I$;
8030 IF T1 THEN PRINT "JOE IS CARRYING A GOLDEN ANKH.":
     GOTO 8080
8040 REM
8050 PRINT "JOE IS NOT·CARRYING ANYTHING."
8080 PRINT : PRINT

8500 REM ** WAIT TILL READY **
8510 PRINT I$I$;
8520 PRINT "(ANY KEY TO CONTINUE)"
8530 PRINT : HTAB 21: GET Q$: REM
8900 REM ** ENUF INFO **
8910 FOR X = 1 TO 3: CALL - 998: NEXT : PRINT : CALL - 958
8920 IF NOT DOING THEN 4600: REM EXPLORING: WHERE WERE WE?
8930 IF F1 THEN PRINT I$"AND THE FIGHT BEGINS!":
     GOTO 100
8940 PRINT I$"IN THE LAST EXCHANGE."
8950 GOTO 2150: REM REPORT

9000 REM + + + ODDS & ENDS + + +
9100 REM ** COMBAT CHART **
9110 PRINT I$I$;
9120 PRINT "— COMBAT CHART —": PRINT : PRINT
9130 PRINT I$" DEFENSE:   SLIGHT   MEDIUM   STRONG"
9140 PRINT "A": PRINT "T NONE "I$;
9150 PRINT I$" 1 "I$" 2 "I$" 3 "
9160 PRINT "T": PRINT "A MODERATE ";
9170 PRINT I$" 4 "I$" 5 "I$" 6 "
9180 PRINT "C": PRINT "K ALL-OUT    ";
9190 PRINT I$" 7 "I$" 8 "I$" 9 "
9200 PRINT ":": PRINT : PRINT
9210 RETURN : REM
10100 REM ** ANY FIGHTER **
10110 IF M4 THEN 4200
10120 M4 = 1
10130 PRINT : PRINT I$;
10140 PRINT "THERE IS SOMEONE HERE!"
10150 GOSUB 1230
10160 PRINT : GOTO 960

10200 REM ** HEAVY FIGHTER **
10210 IF M2 THEN 4200
10220 M2 = 1:L2 = 1
10230 AC(0) = 110:DC(0) = 110: REM JOE IS 100 EACH
10240 HE(0) = 100:EN(0) = 100
10245 PRINT I$"SOMEONE IS HERE.": PRINT
10250 PRINT I$"THIS ONE WILL BE TOUGH."
10260 PRINT I$" HIS ARMOR IS IN BETTER SHAPE"
10270 PRINT I$" THAN YOURS, AND HE HAS A"
10280 PRINT I$" VERY LONG SWORD!"
10290 GOSUB 1220:DOING = 2
10300 GOTO 1950: REM
10350 REM ** BAD MAN'S LOOT **
```

```
10360 GP = 98:LT = 0:L2 = 0
10370 GOTO 2330: REM
10990 REM

20000 REM + + + SPECIAL EVENTS + + +
20100 REM ** THE GOLD ANKH **
20110 GOSUB 1230: PRINT
20120 PRINT I$"THERE IS A SECRET COMPARTMENT"
20130 PRINT I$" BEHIND A LOOSE STONE"
20140 PRINT I$" IN THE WALL."
20150 GOSUB 1220: PRINT
20160 IF T1 THEN PRINT I$"IT'S EMPTY.": PRINT : GOTO 100
20170 PRINT I$"THERE IS A GOLDEN ANKH"
20180 PRINT I$" (A LOOPED CROSS, SYMBOLIC"
20190 PRINT I$" OF LIFE IN SOME RELIGIONS)"
20210 PRINT I$" INSIDE. JOE TAKES IT."
20220 T1 = 1
20230 GOSUB 1220
20240 PRINT : GOTO 100

20300 REM ** HEALING SQUARE **
20310 PRINT : PRINT I$;
20320 PRINT "THE AIR AROUND YOU IS BEGINNING"
20330 PRINT I$" TO GLOW, AND YOU FEEL MUCH"
20340 PRINT I$" LESS TIRED."
20350 SAFE = 250:EN(1) = 100
20360 GOSUB 1210
20370 PRINT : GOTO 4500: REM
20400 REM ** HEAL SQUARE CONT **
20410 PRINT : GOSUB 1220: PRINT I$;
20420 IF T2 THEN PRINT "THE AIR CONTINUES TO GLOW.":
      GOTO 20500
20430 PRINT "THE GLOW IN THE AIR INCREASES,"
20440 PRINT : PRINT : VTAB 22: GOSUB 1220
20450 PRINT I$" AND THE PAIN OF YOUR WOUNDS"
20460 PRINT I$" IS REPLACED BY A PECULIAR"
20470 PRINT I$" TINGLING SENSATION."
20480 HE(1) = HE(1) + 20
20490 T2 = 1: REM
20500 REM ** HEAL SQ CONT 2 **
20510 HE(1) = HE(1) + INT (15 * RND (7) + 15)
20520 IF HE(1) > 100 THEN HE(1) = 100
20530 GOSUB 1210: GOTO 100: REM
20700 REM ** FROM HEAL SQUARE **
20720 PRINT I$"BEHIND YOU, THE GLOW FADES"
20730 PRINT I$" FROM THE AIR."
20740 PRINT : GOSUB 1220
20750 T2 = 0:SAFE = 7: GOTO 4500

20900 REM ** HEAL SQ WALLS **
20910 GOSUB 1230
20920 PRINT I$"THE ROCK SURFACE OF THE WALL"
20930 PRINT I$" HAS BEEN SMOOTHED AND DRESSED,"
20940 PRINT I$" AND THE SHAPE OF AN ANKH HAS"
20950 PRINT I$" BEEN CARVED INTO THE SURFACE."
20970 GOSUB 1220
20990 GOTO 100: REM
```

ATARI DUNGEON THREE

Listing 3

```
3 REM
4 REM THE DUNGEON MACHINE
5 REM PART 3: SPECIAL EVENTS
6 REM
7 REM V: 3.9
8 REM
95 POSITION 2,PEEK(84) - 1:RETURN
100 REM <***> EACH ROUND <***>
110 REM > > NEW PAGE < <
190 REM
200 REM > > PRINT STATUS < <
210 POSITION 2,0:PRINT ST$;
255 POSITION 26,1:PRINT GOLD;
260 POSITION 31,1:PRINT HP;
270 POSITION 36,1:PRINT EP
290 REM
300 REM > > PROMPT & INPUT < <
310 REM GOSUB 1240:REM PAUSE
400 REM > > DECODE & BRANCH < <
420 IF Q = 27 THEN END :REM 27 = ESC KEY
440 IF SQ(12*VS + 4*LS) < > 4 THEN M4 = 0
450 ON DOING GOTO 900,2000
460 GOTO 4000:REM
800 REM > > AN ENCOUNTER? < <
810 IF SAFE*RND(5) > 1 THEN 100:REM NO ENCOUNTER (5160)
```

```
900 REM > > RUN OR FIGHT? < <
904 IF Q = 70 THEN 960:REM 70 = F
906 IF Q < >82 THEN 1300:REM 82 = R
1000 REM <***>UTILITIES <***>
1010 REM > > RANDOM MOD < <
1200 REM > > DELAY TIMER < <
1270 REM DELETE LINE 1270

1300 REM > > BAD INPUT < <
1370 GOSUB 1230:GOSUB 95:GOSUB 66
1390 REM
1470 RETURN :REM
1900 REM > > NEW OPPONENT < <
1950 DEAD = 0:F1 = 1
2000 REM <***> FIGHT! <***>
2010 REM > > INPUTS < <
2045 F1 = 0

2100 REM > > THE ATTACKS < <
2110 GOSUB 2500:REM SET UP
2190 REM
2200 REM > >IN CASE OF DEATH < <
2280 IF L2 THEN 10350:REM
2300 REM > >  LOOT!   < <
2310 GP = 0:LT = 0
2320 LT = INT(7*RND(7)) - 3:IF LT < 0 THEN LT = 0
2330 GP = GP + INT(10*RND(7)) + 2
2340 PRINT I$;"HE WAS CARRYING ";GP;" GOLD PIECES";
2350 IF NOT LT THEN PRINT ".":GOTO 2370
2360 PRINT ",":PRINT :PRINT I$;" ";
2365 PRINT "AND ";LT;" ENERGY PILLS."
2370 PRINT :PRINT :PRINT
2380 GOLD = GOLD + GP:EP = EP + LT
2390 GOSUB 1220:GOTO 4500:REM
2500 REM > >SET UP ATTACKS < <
2600 REM > >COMPUTE ATTACKS < <
2670 HIT = RO - DI*VIT( NOT W)*AC( NOT W)/100
2800 REM > > DAMAGE < <
2900 REM > > REPORT < <
3000 REM > > HEAL & ENERG. < <
3005 REM 81 = Q, 47 = /, 63 = ?
3006 REM 69 = E, 72 = H
3015 IF Q = 47 OR Q = 63 THEN 8000:REM INFORMATION
3190 REM
4030 IF Q = 76 THEN 4300:REM LOOK, 76 = L
4038 REM 30 = , 31 = , 42 = *, 43 = +
4048 REM 68 = D, 67 = C, 47 = /, 69 = E, 32 = SPACE
4065 IF Q = 47 OR Q = 63 THEN 8000:REM INFORMATION
4070 IF Q = 69 THEN 4700:REM EXAMINE
4090 REM
4130 GOSUB 1400
4150 A = 1:E1 = 1
4155 IF SQ(12*VS + 4*HS + 3) = 3 AND T2 THEN 20700
4157 IF SQ(12*VS + 4*HS + 3) = 6 AND T1 THEN 20300
4170 IF SQ(12*VS + 4*HS) = 4 AND D = 0 THEN 10100
4180 IF SQ(12*VS + 4*HS) = 2 THEN 10200
4190 REM
4290 REM
4350 REM DELETE LINE 4350
4390 REM
4405 A = 1:E1 = 1
4490 REM
4505 IF NOT RD THEN 4200
4590 REM
4685 IF SQ(12*VS + 4*HS + 3) = 6 AND T1 THEN 20400
4690 GOTO 800:REM
4700 REM ** EXAMINE **
4710 IF SQ(12*VS + 4*HS + 3) = 2 AND D = 2 THEN 20100
4720 IF SQ(12*VS + 4*HS + 3) = 6 AND D< >2 THEN 20900
4730 REM (MATCH & SEND #3)
4740 REM (ETC.)
4750 GOSUB 1220:PRINT I$;
4760 IF E1 THEN PRINT "YOU SEE NOTHING UNUSUAL.":GOTO 4780
4770 PRINT "STILL NOTHING UNUSUAL."
4780 E1 = 0:GOSUB 1240
4790 GOTO 100:REM
4830 PRINT I$;"FACING   ";:REM 2 SPACES
5000 REM < + + + > INITIALIZE < + + + >
5010 REM > >START PROLOGUE< <
5025 REM I$ IS 3 SPACES, BL$ IS 37 SPACES
5030 POKE 752,1:BL$ = ""
5040 REM DELETE LINE 5040
5050 REM DELETE LINE 5050
5080 PRINT I$;"SIZE AND CAPABILITIES.":? :? :?
5100 REM > >VARIABLES < <
5120 GOLD = 0:E1 = 1
5160 SAFE = 7:REM SEE 810
5170 TIME = 30:REM 30 IS RECOMMENDED FOR THE ATARI
5180 REM DELETE LINE 5180

5200 REM > >STRINGS < <
5210 DIM NAME$(3) ,PROF$(1) ,Z$(1) ,E$(18) ,P$(21) ,ST$(38)
     :NAME$ = "JOE":PROF$ = "F"
5270 ST$ = "NAME   PR HEALTH ENERGY GOLD HEAL ENRGZ"
5280 REM DELETE LINE 5280

5300 REM > >STRING ARRAYS < <
5310 REM DELETE LINE 5310
5320 REM DELETE LINE 5320
5350 DIM O$(132)
5360 O$ = "SP:FWD    - >:RT   C:COMPASS D:ROOM DESCR   ?:INFO
     < - :LT   E:EXAMINE L:LOOK AHEAD/F:FIGHT   R:RUN/"
5380 O$(95) = "1-9:FIGHT   H:HEAL   E:ENERGIZE   ?:INFO/"

5400 REM > >COMBAT SPECS< <
5490 REM
5510 GOSUB 1220:REM PAUSE
5520 GOSUB 9100:REM COMBAT CHART
5540 REM DELETE LINE 5540
5550 REM DELETE LINE 5550
5560 REM DELETE LINE 5560
5570 REM DELETE LINE 5570
5575 REM DELETE LINE 5575
5580 PRINT I$;"    (ANY KEY TO CONTINUE)":PRINT :REM 4 SPACES
5600 REM > >INTRODUCTION < <
5615 DIM Q$(35)

5700 REM > >COMBAT STRINGS < <
6010 REM ** SETUP **
6015 REM RM IS NUMBER OF CURRENT ROOM < SQ(12*VS + 4*HS + 0)
     >. RD IS FLAG: 0 IF NOT DESCRIBED YET
6090 REM
6190 REM
6290 REM
6340 REM
6390 REM
6960 REM

8000 REM + + + INFORMATION + + +
8010 GOSUB 9100:REM COMBAT CHART
8020 PRINT :PRINT I$;
8030 IF T1 THEN PRINT "JOE IS CARRYING A GOLDEN ANKH.":
     GOTO 8080
8040 REM
8050 PRINT "JOE IS NOT CARRYING ANYTHING."
8080 PRINT :PRINT

8500 REM ** WAIT UNTIL READY **
8510 PRINT I$;I$;
8520 PRINT "(ANY KEY TO CONTINUE)"
8530 POKE 752,0:POSITION 19,PEEK(84):PRINT " ";:GET
     #1,Q:POKE 752,1:REM
8900 REM ** ENUF INFO **
8910 FOR X = 1 TO 3:GOSUB 95:NEXT X:PRINT :GOSUB 66
8920 IF NOT DOING THEN 4600:REM EXPLORING: WHERE WERE WE?
8930 IF F1 THEN PRINT I$;"AND THE FIGHT BEGINS!":GOTO 100
8940 PRINT I$;"IN THE LAST EXCHANGE."
8950 GOTO 2150:REM REPORT
9000 REM + + + ODDS & ENDS + + +
9100 REM ** COMBAT CHART **
9110 PRINT I$;I$;
9120 PRINT " — COMBAT CHART — ':PRINT :PRINT
9130 PRINT I$;" DEFENSE:   SLIGHT   MEDIUM   STRONG"
9140 PRINT "A":PRINT "T NONE   ";I$;
9150 PRINT I$;" 1 ";I$;"   2 ";I$;"   3 "
9160 PRINT "T":PRINT "A MODERATE   ";
9170 PRINT I$;" 4 ";I$;" 5     ";I$;"   6 "
9180 PRINT "C":PRINT "K ALL-OUT   ";
```

```
9190 PRINT I$;" 7 ";I$;"   8  ";I$;"    9 "
9200 PRINT ":":PRINT :PRINT
9210 RETURN :REM
10100 REM ** ANY FIGHTER **
10110 IF M4 THEN 4200
10120 M4 - 1
10130 PRINT :PRINT I$;
10140 PRINT "THERE IS SOMEONE HERE!"
10150 GOSUB 1230
10160 PRINT :GOTO 960

10200 REM ** HEAVY FIGHTER **
10210 IF M2 THEN 4200
10220 M2 - 1:L2 - 1
10230 AC(0) - 110:DC(0) - 110:REM JOE IS 100 EACH
10240 HEALTH(0) - 100:ENERGY(0) - 100
10245 PRINT I$;"SOMEONE IS HERE.":PRINT
10250 PRINT I$;"THIS ONE WILL BE TOUGH."
10260 PRINT I$;"HIS ARMOR IS IN BETTER SHAPE"
10270 PRINT I$;" THAN YOURS, AND HE HAS A"
10280 PRINT I$," VERY LONG SWORD!"
10290 GOSUB 1220:DOING - 2
10300 GOTO 1950:REM
10350 REM ** BAD MAN'S LOOT **
10360 GP - 98:LT - 0:L2  - 0
10370 GOTO 2330:REM

20000 REM + + + SPECIAL EVENTS + + +
20100 REM ** THE GOLD ANKH **
20110 GOSUB 1230:PRINT
20120 PRINT I$:"THERE IS A SECRET COMPARTMENT"
20130 PRINT I$;" BEHIND A LOOSE STONE"
20140 PRINT I$;" IN THE WALL."
20150 GOSUB 1220:PRINT
20160 IF T1 THEN PRINT I$;"IT'S EMPTY.":PRINT :GOTO 100
20170 PRINT I$;"THERE IS A GOLDEN ANKH"
20180 PRINT I$;" (A LOOPED CROSS, SYMBOLIC"
20190 PRINT I$;" OF LIFE IN SOME RELIGIONS)"
20210 PRINT I$;" INSIDE.  JOE TAKES IT."
20220 T1 - 1
20230 GOSUB 1220
20240 PRINT :GOTO 100

20300 REM ** HEALING SQUARE **
20310 PRINT :PRINT I$;
20320 PRINT "THE AIR AROUND YOU IS BEGINNING"
20330 PRINT I$;" TO GLOW, AND YOU FEEL MUCH"
20340 PRINT I$;" LESS TIRED."
20350 SAFE - 250:ENERGY(1) - 100
20360 GOSUB 1210
20370 PRINT :GOTO 4500:REM
20400 REM ** HEAL SQUARE CONT **
20410 PRINT :GOSUB 1220:PRINT I$;
20420 IF T2 THEN PRINT "THE AIR CONTINUES TO GLOW."
    :GOTO 20500
20430 PRINT "THE GLOW IN THE AIR INCREASES,"
20440 PRINT :PRINT :POSITION PEEK(85) ,21:GOSUB 1220
20450 PRINT I$;" AND THE PAIN OF YOUR WOUNDS"
20460 PRINT I$:" IS REPLACED BY A PECULIAR"
20470 PRINT I$;" TINGLING SENSATION."
20480 HEALTH(1) - HEALTH(1) + 20
20490 T2 - 1:REM
20500 REM ** HEAL SQ CONT 2 **
20510 HEALTH(1) - HEALTH(1) + INT(15*RND(7) + 15)
20520 IF HEALTH(1) > 100 THEN HEALTH(1) - 100
20530 GOSUB 1210:GOTO 100:REM
20700 REM ** FROM HEAL SQUARE **
20720 PRINT I$;"BEHIND YOU, THE GLOW FADES"
20730 PRINT I$;" FROM THE AIR."
20740 PRINT :GOSUB 1220
20750 T2 - 0:SAFE - 7:GOTO 4500

20900 REM ** HEAL SQ WALLS **
20910 GOSUB 1230
20920 PRINT I$;"THE ROCK SURFACE OF THE WALL"
20930 PRINT I$;" HAS BEEN SMOOTHED AND DRESSED,"
20940 PRINT I$;" AND THE SHAPE OF AN ANKH HAS"
20950 PRINT I$;" BEEN CARVED INTO THE SURFACE."
20970 GOSUB 1220
20990 GOTO 100:REM
```

—**William Beyermann**

C-64: THE INTERRUPTED SPRITE

Programming can get real tough at times. Finding new ways to manipulate thousands of bytes isn't easy, and when a new technique or programming trick is discovered, it should be shared. This makes it easier for the rest of us. With that in mind, here's a handy, horizon-expanding routine, in Basic, short enough so as not to wear out the ol' fingers.

Multiple Sprites. As you probably know, your C-64 has eight sprites. Ever want more? You got it. Our first routine uses interrupts and the raster register. How is it done? Well, your television set places an image on the screen starting at the top left-hand corner of the screen. It then scans across until the right edge is reached. At this point the scan jumps back to the left and down to start the next line. This process is repeated until your final image is produced. The C-64 raster register holds a number representative of the line currently being scanned. Our routines will perform their designed task only when this register contains a specified value. This jump from normal system functioning is called an *interrupt*. It is what makes these unique routines possible. Enter and run these lines:

```
5 POKE 53280,0: POKE 53281,0: PRINT" "
10 FOR I - 0 TO 61: READ A:POKE 49152 + I,A: NEXT:REM < -
   STORE INTERRUPT ROUTINE
20 FOR I - 0 TO 62: READ A: POKE 832 + I,A: NEXT:REM < - READ
   SPRITE DATA
40 FOR I - 2040 TO 2047: POKE I,13: NEXT:REM < - SPRITE
   POINTERS
50 FOR I - 53287 TO 53294: POKE I,RND(0)*7 + 1: NEXT:REM < -
   SPRITE COLORS
60 FOR I - 0 TO 14 STEP 2: POKE 53248 + I,22 + 14*I:
   NEXT:REM < - HORZ. POSITION
70 FOR I - 53249 TO 53263 STEP 2: POKE I,60: NEXT:REM < -
   VERT. POSITION
80 POKE 53269,255:POKE 56333,127:REM < - INTERRUPTS OFF
100 POKE 788,0: POKE 789,192: REM < - POINT TO NEW ROUTINE
110 POKE 53265,PEEK(53265)AND127
120 POKE 56333,129: POKE 53274,129:REM < - TURN ON
    INTERRUPTS
210 FOR I - 1 TO 170 STEP 2:POKE 53248,PEEK(53248) + 1
212 POKE 53262,PEEK(53262) - 1:NEXT I
230 FOR I - 1 TO 170 STEP 2:POKE 53248,PEEK(53248) - 1
232 POKE 53262,PEEK(53262) + 1:NEXT I
240 GOTO 210
510 DATA 173,25,208,41,1,208,3,76,49,234,141,25,208,173,18,208,48,34
520 DATA 169,160,141,18,208,169,100,141,1,208,141,3,208,141,5,208,
    141
530 DATA 7,208,141,9,208,141,11,208,141,13,208,141,15,208,76,188,254
540 DATA 169,90,141,18,208,169,60,24,144,219
600 REM ****** SPRITE DATA ******
610 DATA 32,0,0,32,0,0,32,0,0,112,0,0,32,60,0,32,36,0,33,231,128,39,255,
    224
620 DATA 31,255,248,127,231,254,255,255,255,255,255,255,1,209,128,0,
    126,0
630 DATA 0,24,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
```

Notice how a change in a sprite directional register affects two sprites instead of one. Also, all of your sprite manipulating features are still available to you. —**Rudolph M. Daniel,** *SoftSync*

What Sort of Being Reads Softline?

He's aware. He's concerned. He takes chances, but he covers his bets. He can hold his liquor. He's covered with purple scales. He looks out for his friends. He flies over the countryside, laying waste to entire townships with a single gout of flame.

But mostly, he plays games. A lot. . . .

When we asked him what he liked best about *Softline*, he responded with a thoughtful silence. We tried prompting him a little. ''Could it be our in-depth articles on the various game genres? Or our tutorials on how to build adventure, fantasy, and arcade games? Or the contests? The prizes? How about Infomania, our wacko computer news column?''

Looking up briefly from his monitor, he reflectively blew a brimstone smoke ring. Then, in a scratchy basso profundo, he answered, ''Actually, I enjoy all of that stuff a great deal. But I think the thing I like best about *Softline* is the price. For $12 a year I can actually afford to use the back issues to relight my pilot. By the way, you wouldn't by any chance have a match on you, would you?''

Softline
P.O. Box 60
North Hollywood, CA 91603

JOCK ROOT

DUNGEON FUN

How To Meet Monsters and Influence Amulets

When we left Joe, a couple of issues back, he could move around through a "real" map, but (as Kipling said of primal Cat) all places were alike to him. Everywhere he went, nothing much happened. Oh, he would meet his *doppelganger* every now and then and fight him to the death, which would surprise most of us, but he's quite used to that by now. What he wants is an interesting place to visit, and maybe somebody new to fight with.

O fortunate Joe! We are not only going to give him those things—a place where he can always find his kind of people, and a place where he can find somebody even worse—but also, if he knows where to look, we are going to let him find a magic amulet. When he carries this amulet, he can be healed of any wounds, simply by standing on a certain square.

In other words, this issue's program deals with room monsters, secret compartments, and one kind of magical treasure. There are also two new commands: *examine*, which is how you find a secret compartment, and *?-for-Information*, which is a combination of *inventory* and *help* (it can also provide messages from the gods, if desired).

Joe's World. If you're just joining us, you may be wondering what's going on here. We are developing a fantasy world simulation program, or dungeon machine. When it's finished, you will be able to load it with your own fantasy world—dungeon or castle, ruined temple, hollowed-out asteroid, or whatever—peopled with your own selection of nasty creatures and trimmed with traps and deadfalls of your choice. Send your favorite adventurers into it and watch them try to survive! We will also establish a protocol for storing characters on disk, so when you've made your dungeon so hairy that none of your own people can survive it, you can invite your friends to bring their characters over.

That's where we're going. Where we are now is a little less dramatic, but it's beginning to be ver-ry in-nteresting. Our viewpoint character is Joe, a Fighter by profession and completely average in every respect. (In Joe's world, being a Fighter is average—like being a Witch, or a Lawful Thief.) He wears "basic Man-at-Arms": breastplate and helmet, forearm and shin protectors, a large shield, and a longsword (not magical). He has average strength, average smarts, and average luck, but he's a better-than-average swordsman (we hope; that will be up to you).

For now, he only has an isolated group of four rooms to work in (unless you were here last time and wrote in some more of your own), but that provides enough room to get lost in. This time we're putting in some regular stuff and a bit of furniture, even some decorative artwork on the walls. . . . The place is beginning to feel real homelike!

Places on a Map. Joe's world, the game environment, is represented by a map. The map must be drawn on squared paper, in which each square represents one "standing point"—the area that one person, standing in the middle of it, can cover with a sword (six to ten feet square, depending on which authority you consult). Rooms and passageways, on the map, are made up of multiples of this block. Doorways are normally one square wide. Everything on the map is represented in terms of squares (see the September – October issue for a fuller explanation, with instructions for making your own).

Whenever Joe steps onto a new square (that is, when you press the space bar, which is the *forward* command), the program tells him (you) what he can see—that is, what is on the side of the square in front of him (wall, doorway, or open space) and to his right and left. He can also look ahead (press L), if the way is clear in front of him, and see what is around the next square. He can turn right or left with the arrow keys, and he has a magic compass, which tells him not only which direction he's facing, but also which square of the map he's on.

This time we are going to give him a couple of new abilities: the ability to get help on request (by reviewing the combat chart or by taking inventory of things in his pack) and the ability to examine a wall for hidden extras.

New Commands. In real life, you don't normally see a secret compartment; your glance passes right over it. Only if you look closely, in the right place, will you discover the telltale signs. The world created by our dungeon machine works the same way: Joe is going to have to look closely at a wall—to *examine* it—before he finds any hidden items.

There is a new command for that purpose included among the options you have while exploring. If there is anything hidden in the wall in front of Joe, pressing "E" will reveal it. It is also legal to examine an open door or empty space, if that's what's in front of Joe; there is no penalty for this, other than the chance of somebody coming along and picking a fight with you.

The programming technique involved is simple enough. When you input an E, the program checks the number of the square you're standing on, and the direction you're facing, against a list. If there's a match, the program jumps to a subroutine that tells you what Joe has found.

Sometimes finding something is not enough; you might want Joe to take it with him. That means a change in the Apple's image of Joe. Now he has to be carrying something. The subroutine mentioned above can take care of that, but we still need something more: We need a way for the player to find out what Joe is carrying.

And that's what the other new command is for: the question mark (you don't have to press the shift key, just the ?/ key). It gives you a review of the combat chart (the numbers you can input during a fight and what they do), and it tells you what Joe is carrying at the moment. You can do this even in the middle of a fight, if you want to.

In the present version of the program, this command isn't very important. There's only one thing that Joe could be carrying, and you can remember whether he has it or not. However, in future versions this will become an *inventory* command, which will let you examine the whole party.

The Machinery. The complete program (so far) is listed in the program section, page 29. The activities are divided into five main sections, as follows:

Activity	Line Numbers
Initialize	5000 – 6990
Main Loop	100 – 460
Combat	2000 – 3130
Movement	4000 – 4870
Special Events	20000 up

The first three sections were explained in the July – August issue from last year; they will not be covered again here. However, you can probably figure out the logic if you study this month's listing. Here are a couple of hints: The variable HEALTH(1) shows how wounded Joe is (100 means not a scratch, 0 means dead), while HEALTH(0) shows the same thing about Joe's opponent. The value of the variable DOING shows what Joe is doing at the moment—fighting, exploring, or whatever.

Movement was covered in the September – October issue, with instructions on how to design your own map and write it into the program. You'll have to seek the information there—but be careful of the program listing in that issue; it has a bug in it!

We herewith humbly apologize to all those patient readers who typed in that listing and ran it—only to have it crash, halfway through the introduction! Sloppy housekeeping on our part, that was. A line from an earlier version had been left in (specifically, line 5575), and this derailed a "read/data" loop, making gibberish and an error break. Sorry about that; we tried to be more careful this time.

Special Events. We have added a whole new class of events—namely, things that happen in a particular place. These can be things you ask for with *examine*, or things that happen simply because you arrive there. And that's not all. Just to make it more complicated (we know how you love complications), we have included an event that happens only if you get there *with* something.

They all have this in common: They depend on a match test of SQ%(VS,HS,3). We have been using the array SQ%(2,2,3) to store information about the squares of the map: List number 3 of this array gives the number of each square, so SQ%(VS,HS,3) gives the number of the square at vertical displacement VS and horizontal displacement HS (which is where Joe is standing at any moment).

Some of these tests also consider the variable D, which is the direction Joe is facing. That determines, for example, which wall he is looking at. Other tests consider a T flag (there are two of them, T1 and T2), which shows whether or not Joe has found a particular treasure.

In any case, if a match is found, it means that Joe is standing in the right place and facing in the right direction (or carrying the right thing) for something to happen. The program then jumps out to the appropriate "special event" routine to describe it. These routines start at line 20000, and the match tests that call them are on lines 4155, 4157, 4710, and 4720.

Being There. The simplest kind of special event is triggered just by stepping onto the right square (that's how they do a chute or a pit in *Wizardry*, for example). The logic of it is this: Whenever Joe steps on a new square, the program checks the number of that square against a list. If the square is included in the list, it will send the program to a routine that handles the special event that goes with that square.

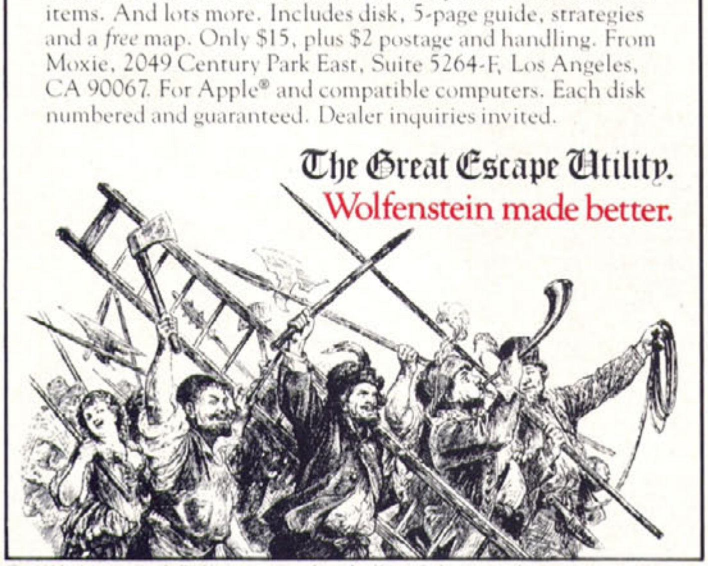
The only way Joe can get to a new square is by moving forward (press the space bar, ASCII code 32), so the list check is done as part of the routine for moving forward (lines 4100 – 4180). There are two such checks in the program, lines 4155 and 4157.

Neither of these lines is quite as simple as what we described. Consider line 4157: It has the list check, in the form of a match test (If SQ%(VS,HS,3) = 6), but it checks for something else, too, with "and T1". What's this T1?

T1 is a "flag" or indicator variable, which represents the magic amulet. It equals 1 if Joe has found the golden ankh, or 0 if he has not (see line 20220). This particular effect only works if Joe is carrying the amulet, so he only gets to the routine at 20300 if he is both in the right place (the SQ% number matches) and carrying the right thing (T1 = 1).

Line 4155 is similar. In this case the flag is T2, which is the healing effect itself. It's turned on (T2 = 1) in line 20490, and off in line 20750. T2 keeps track of whether this is your first time through the loop. The message displayed is different for subsequent passes (see line 20420).

When You Examine. The *examine* command is similar to a special event, but with two important differences. It looks for a match to SQ%(VS,HS,3), as usual, but it also tests the variable D, which shows the direction Joe is facing (0 = North, 1 = East, and so on). After all, Joe is supposed to examine the wall in front of him, not the ground he's standing on.



More important, this effect has to be requested: it's not automatic, like falling into a pit. When you input an E, the program jumps from line 4070 to line 4700, where it starts checking through a list (lines 4710 to 4740, with 4730 and 4740 not used yet). If Joe's location and direction match items in the list, he will see something special; if not, the program falls through to line 4760 and "you see nothing unusual."

Line 4770 and flag E1 (in lines 4760, 4780, 4150, and 4405) are in case Joe wants to examine that wall several times in succession. In the present version of the program, one careful look will reveal a secret compartment, but in future versions, or your own modification of this, a random number could be used so that Joe might not see it the first time (using a technique similar to that used for "safe" in lines 5160 and 810).

Room Monsters. Finally, we have a kind of special event that is triggered by entering a room, not by stepping on a particular square. The main use for this technique is with a monster who lives in a particular room. We have it in two flavors: a room where you will always find somebody, everytime you go there; and a room where you will find a particular somebody, once only.

This works like a special event, except for one important difference: these tests are made in lines 4170 and 4180, *after* line 4160. What's so important about line 4160? You can only get past it if RD = 0, and that will only be true when you first step into the room (lines 4120 and 4250). The result of this is that you will meet the monster when you first enter the room, but further moving around in the room will not reawaken him.

With this technique, you can "reload" the monster simply by going out of the room and coming back in. In some cases, that's an advantage. It gives us one room, in our dungeon, where Joe can always find an opponent. But suppose you want a "unique" room monster, one that's only there the first time you go in, and once it's killed it's gone forever (until the next trip)?

We do that with the routine starting at 10200. We use the flag M2 to represent this particular monster. A value of 0 means he's still waiting to pounce, and a value of 1 means that Joe has found him and used him up.

Whenever the Apple starts a new program, it initializes all variables to zero, which is the correct value for M2 at the beginning of our program. If you're using a different system, you may want to add a line such as "5175 M2 = 0" to the program.

By the way, note line 10230. This makes this particular bad guy a 10 percent better fighter than Joe (maybe he has a magic sword, or just more experience). We'll go into what determines AC and DC in a future issue.

And that's it, for this time. You can now put quite a number of different events into a dungeon, using this system. All it really needs now is an entrance and an exit, but those are not as simple as they look. If you have exited (or not yet entered) the dungeon, why then you must be somewhere else; so we will need a somewhere else program (some people call it the castle). We will have to deal with that next time. . . . SL

Atari in Chains

That's right: Atari folks can now be incarcerated along with Joe and all the happy Apple people wandering around inside our burgeoning dungeon—running, jumping, hacking, slashing, healing, and standing still. The conversions of the first two levels (combat and movement), with explanation of Atari Basic statements and routines, are available on paper in exchange for a self-addressed, stamped envelope. Once you've got those, you can get all caught up by adding the Atari listing for level 3 (special events), appearing in the Programs in Pulp section of this very issue. (Why? Because we like you!)

Send to: Softline Free Fun
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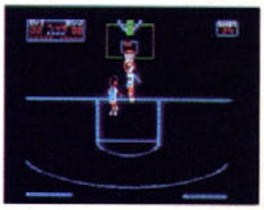
SOFTWARE ARTISTS?

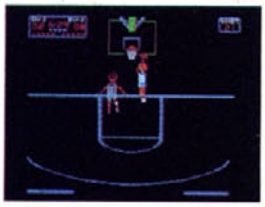
How we got this year's hottest sports game out of two rather inexperienced designers.

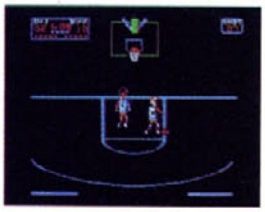
TO MAKE THE FIRST BASKETBALL PROGRAM that feels like the real thing, it helps to start with two guys who know what the real thing feels like.

Enter Larry Bird and Julius Erving. Bird — the hustler, the strong man, deadly from outside. Erving — The Doctor, maybe the most explosive player in the history of the game.

We talked to them, photographed them in action, studied their moves and their stats and their styles. Then we set out to create on computer disc an event which may never happen in real life. We put the two of them together on a dream court of light, for an electronic afternoon of one-on-one.





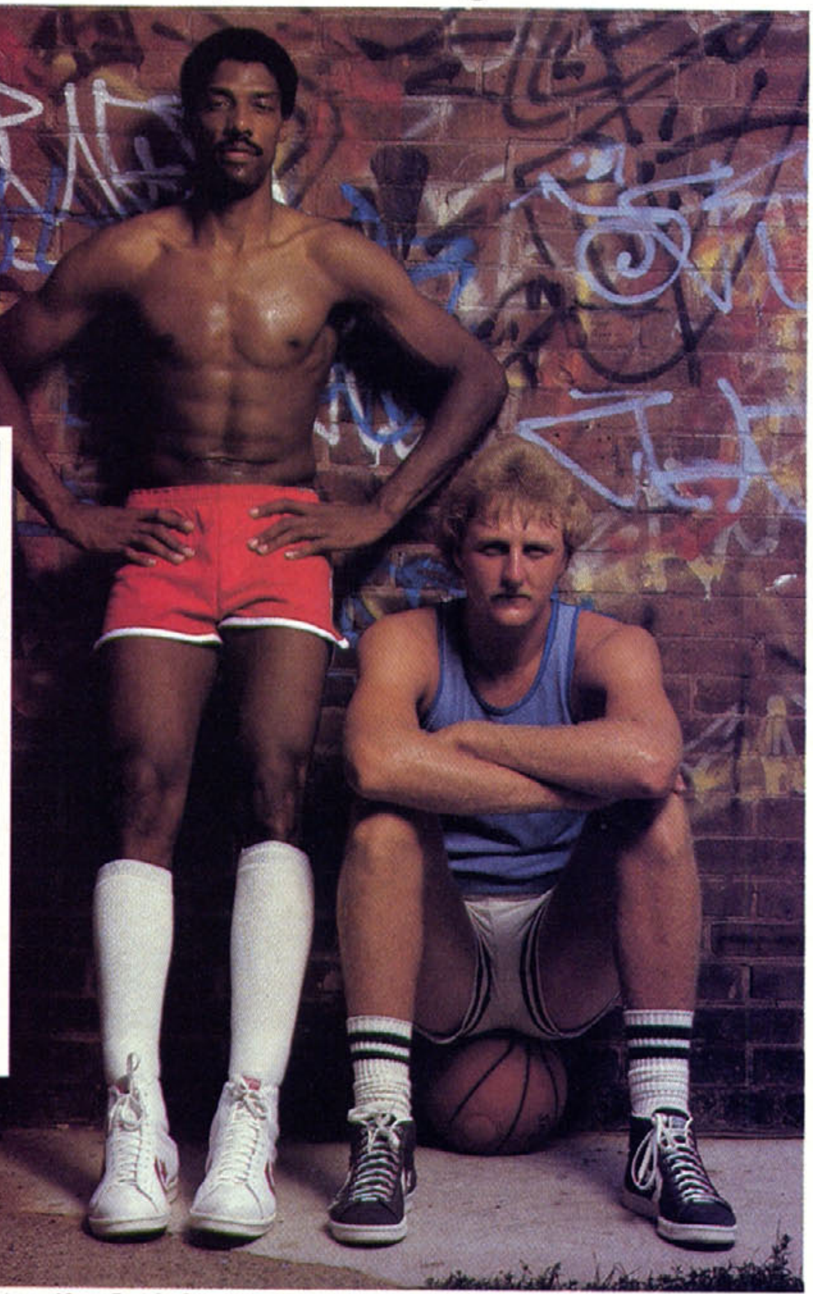


It wasn't easy. When they talked, we listened. When they criticized, we made big changes. When they gave suggestions, we took them.

And it shows. This thing is absolutely uncanny. You actually take on all the skills and characteristics of Bird or The Doctor — their own particular moves, shooting abilities, even strength and speed.

You'll meet with fatigue factors, hot and cold streaks, turnaround jump shots, and 360-degree slam dunks. But there's some whimsy in here, too — a funny referee, a shattering backboard, even instant replay.

It's called *Julius Erving and Larry Bird Go One-on-One.*™ You're Bird. Or you're The Doctor. And that's the last decision you'll have plenty of time to make.



Julius Erving and Larry Bird Go One-on-One is now available on diskette for Apple II, II+, and IIe computers. Apple is a registered trademark of Apple Computer. To find out more about Electronic Arts and its products, write us at 2755 Campus Drive, San Mateo, CA 94403 or call (415) 571-7171.

ELECTRONIC ARTS™

Illustration by Weldon O. Lewin

It May Catch On

Return with us now to those thrilling days of yesteryear.

Remember those box tops you used to cut out and send in to the cereal companies? You know, the ones that gave you treasures in return (depending on the length of your memory), anything from a Captain Midnight Decoder Badge to the ever-popular Captain Crunch Whistles (the ones that used to drive Ma Bell crazy by bypassing her long-distance billing system). Well, those days are gone but apparently not forgotten.

That's right, boys and girls, once again you can send in those box tops and receive valuable gifts and prizes. In fact, now you can receive an Atari home computer free—almost.

It's all part of a joint campaign called "Catch On to Computers," launched by two megacorporations, General Foods's Post cereals and the newly streamlined Atari, to "promote computer literacy across the United States."

The national program—which began on September 30, 1983, with the mailing of catalogs detailing the program to a mere ninety-one thousand schools, as well as simultaneous direct mailings to forty-one million homes—features extensive "promotion, merchandising, advertising, publicity, special events and. . . ." Well, you get the picture.

Tom Herkskovits, general manager of General Foods's Breakfast Foods Division, notes, "Given the financial condition of many schools, we've been able to develop a constructive, responsible promotional vehicle that addresses a real need in the educational sector."

Part of that vehicle consists of boosting sales of Post cereal products through the introduction of incentive marketing, by way of Atari hardware and software, to educational facilities throughout the country. Here's how:

Each proof-of-purchase seal on a Post cereal box is worth from 1 to 4 points; bigger boxes equal higher points. Prizes range from a teevee switch box for 150 points (37.5 boxes of Grape Nuts), to an Atari 1450XLD Computer for 16,800 points (that's 4,200 boxes of cereal, if you buy the large box).

Linda Gordon, senior vice president of Atari Education Department, feels optimistic about the program. "We consider computer literacy one of the greatest challenges facing American education today," says Gordon. " 'Catch On to Computers' is important because it helps people realize the computer is not just a toy but a real problem-solving tool."

A ten-day series of one-hour classes designed to give groups of all ages hands-on training began last October 5 in New York. Similar "learning festivals" are planned for San Francisco, Los Angeles, Saint Louis, Denver, Chicago, Houston, New Orleans, Atlanta, and Washington, D.C. Sites will include public libraries, learning centers, and museums.

How has the response been to the ten-day computer learning fest?

"Extremely good," says Lydia Padilla, administrative assistant of education at the Museum of Science and Industry in Los Angeles. "We have twenty computers—Atari 1200 XLs—installed in the classroom, which can accommodate two people per computer. Three instructors, required to have previous experience with computers along with a special instruction class from Atari, are on hand at all times teaching classes that begin every hour on the hour, ten hours a day."

"The classes introduce Atari Logo," explains Helen Bedrosian, one of the museum's ten instructors. "Because it's a graphics language, students can design, color, and have a lot of fun with it."

While a single one-hour class can't make a person computer-literate, it can make computers seem a little less threatening and a little more inviting. And that is, after all, the object of any good marketing strategy.

Will the success of this national publicity campaign lead to a new market trend? Will Steve Wozniak make an appearance on behalf of Nabisco? ("Cream of Wheat! It . . . is . . . awesome!") Will Commodore join up with Kellogg's and appoint Tony the official spokestiger?

Probably not. That would be silly.

The "Catch On to Computers" box-top offer ends June 30, 1984.

For additional information, write to Catch On to Computers, Box 3445, Kankakee, IL 60902.

—Howard A. Shore

THE DOCTOR IS ON

"One morning while I was ruminating in the shower about what kind of slogan would succinctly summarize the tactics for increasing intelligence, six words came to mind.

"Dripping wet, with a towel around my waist, I walked to the study and wrote down this phrase: 'Turn on, tune in, drop out.' Later it became very useful in my function as a cheerleader for change. . . . Unhappily, my explanations of this sequence of personal development were often misinterpreted to mean 'get stoned and abandon all constructive activity.' "

—Timothy Leary, *Flashbacks*

For those who were there, Dr. Leary's legendary exploits in search of the expanded mind largely made the sixties what they were. Now he believes that the process of evolution toward an advanced state of consciousness is possible through the intelligent use of computers.

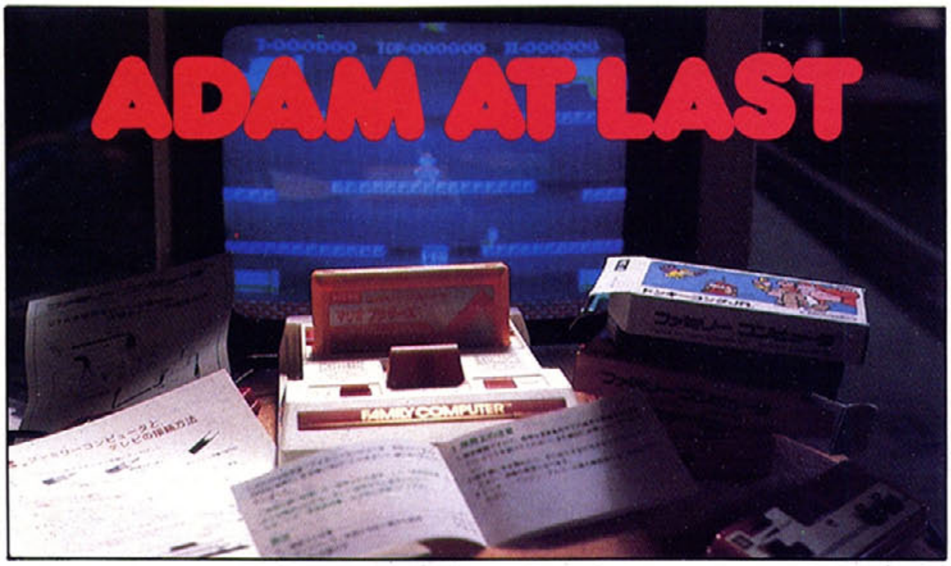
These days, the good doctor has his own IBM PC and is writing a book on the subject of computer-enhanced intelligence, to be published later this year by Xor Corporation, accompanied by appropriate software.

Leary's ideas are based on the psychological phenomenon of "imprinting," the fairly mysterious process that causes baby ducks to think the first large moving object they see is Mom, and which, in humans, determines an individual's behavior patterns and personality shortly after birth. In his controversial experiments at Harvard in the sixties, Leary sought a way for subjects to alter their original "programming" through the use of psychedelic drugs.

In other words, Leary perceives computers in the eighties as he perceived LSD in the sixties. He also notes approximately the same reaction to such ideas now as then, and categorizes those reacting to the computer revolution into three groups: those who are frightened of being overcome or replaced by computers and would like the whole thing to go away; those who think it's all right for certain individuals, under government supervision; and those who believe that any human being has the right to increase his intelligence by any means available.

"We don't use our brains," says Dr. Leary, "our brains use us."

ADAM AT LAST



The prodigal computer arrived, and no one could get their hands on one. *Consumer Reports* gave it a preliminary rave review based on what was promised, then went out and bought four of them . . . and none of them worked. "Sorry," said *CR*. And that's more luck than most mags have had.

The various units are easy to assemble. Unfortunately, the main unit derives its power from the printer, which sounds like an indecisive popcorn popper. Without a printer, or with the printer switched off, the system cannot function.

If you power up with a program tape in the drive, the program will bomb out. It is advisable not to leave tapes anywhere near the computer. Thumbnail system evaluation: looks great, sounds terrible.

This is getting depressing. But hey, the built-in word processing is rather nice. At all times, a row of boxes appears at the bottom of the screen, each box containing an option and corresponding to the function keys at the top of the keyboard. Choose an option, and additional options become available.

Storing a six-sentence file on the high-speed cassette system took 45 seconds; retrieving it took 10 seconds. Several times, the attempt to retrieve a file would be greeted with a "cannot access this file" message. At this point the system would lock up and the computer had to be reset.

Coleco's version of Applesoft runs slower but offers sixteen hi-res colors. There seems to be no way to access assembly language through Basic.

Game-wise, this baby has potential. Besides the instant gratification of access to the ColecoVision cartridge library, the high-speed cassette system offers serious memory capacity and more varied game play. *Planet of Zoom* (load time: 50 seconds) has an impressive variety of scenes. The tape appears to advance during play, loading the next graphics sequence into memory. High scores are saved on tape.

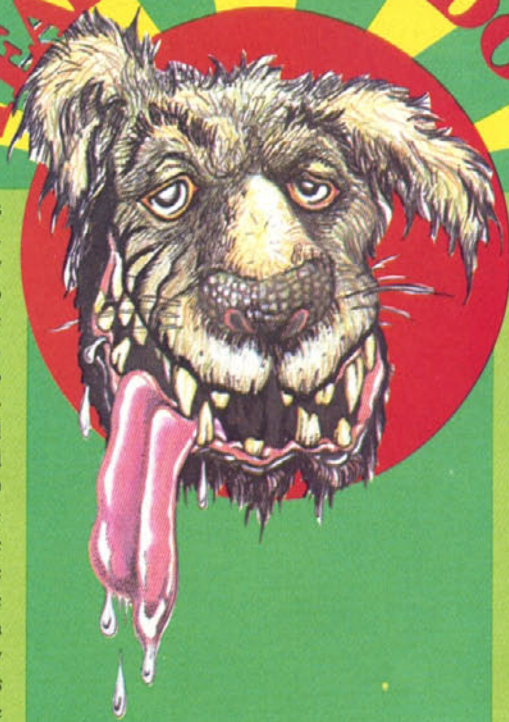
Various game programmers sat down at this particular Adam to familiarize themselves with it, and a pattern was observed: They all quickly realized that at the heart of the matter was the good old ColecoVision game machine, and they dug out the *Mr. Do* cartridge and proceeded happily to use the system as ColecoVision.

So there you have it. But do you want it?

—Benjamin Balsam

The competition squares off. On the one hand, we have the Adam computer from Coleco. On the other, we have the Family Computer from Nintendo, available at fine department stores throughout the Ginza district, Tokyo. It is more compact, has a manual written in Japanese, and plays a truly wonderful game of Mario Bros.

The Second Annual YEAR OF THE DOG



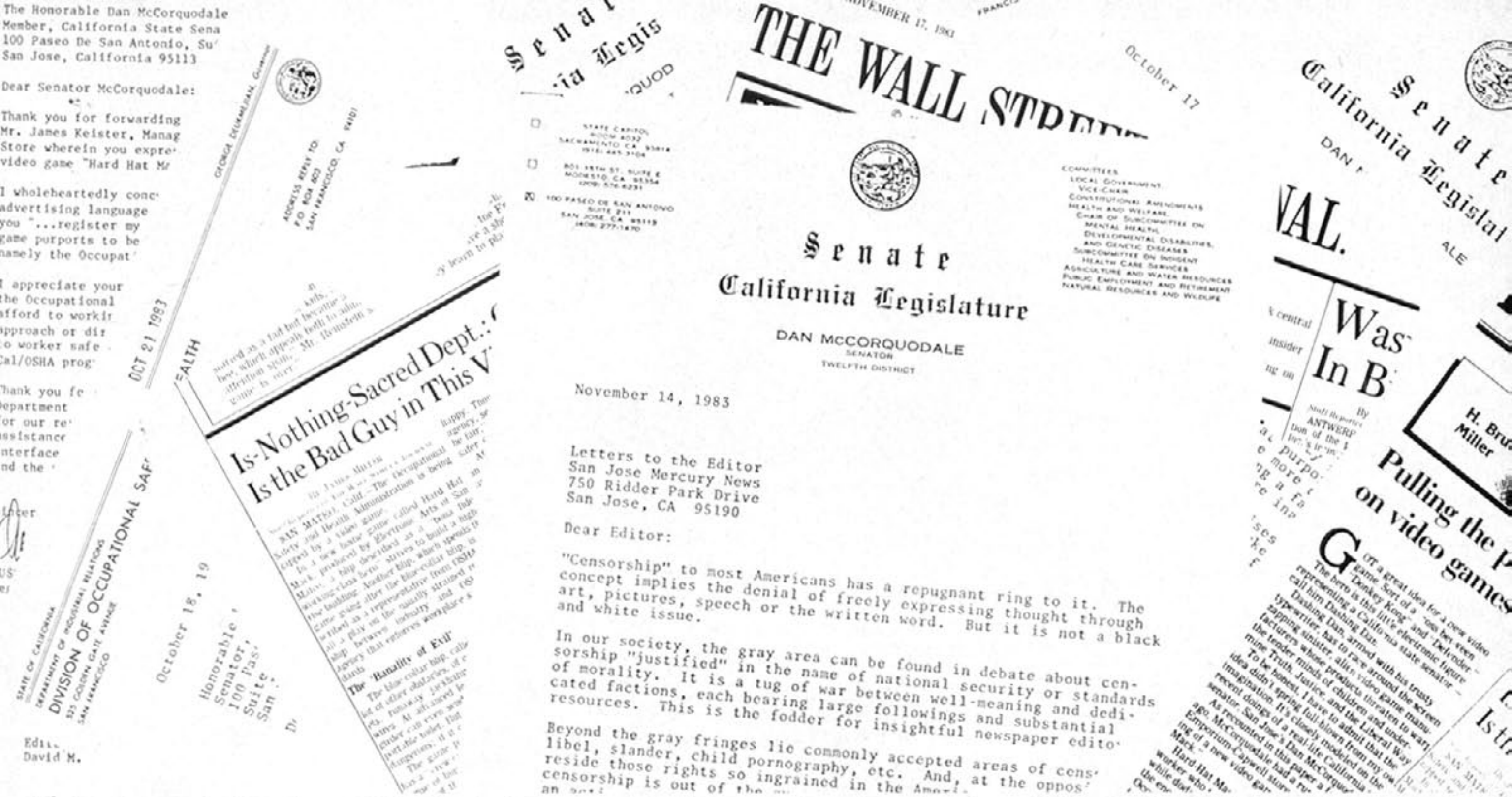
Once again, we are in an election year. It's time to act on a sacred constitutional principle. It's time to exercise the rights of a free citizenry in a swinging democratic republic. Its time to boot up and be heard. Let *Softline* know the names of the worst games you played in 1983.

Was it not Oliver Wendell Holmes who said, "If not for the prevailing wisdom of computing individuals within a system of mutual governance, we might all have gotten suckered into buying an Atari 2600 just for the $40 rebate"? Perhaps. Perhaps not. It is easy to be lulled into a smugness, a critical laxity, by the generally high quality of entertainment to be had on the wondrous device that is your home computer . . . when suddenly, something—a graphics display seemingly created by a cranky five-year-old, animation that makes *Thunderbirds Are Go* look like *Return of the Jedi*, an adventure puzzle based on the logic of madness—will flash onto your screen. The hairs rise on the back of your neck, the call to arms is sounded, you feel the need to make your voice heard, and you give thanks once again that your computer has taught you so well how to appreciate a quality product.

Your vote counts. We will be having a drawing among all ballots received to award a hand-selected stinker as a patriotic bribe to encourage your participation in the electoral process. If you wish to be in the running for a prize, scrawl your name and address in any available space on the ballot. If you don't need that incentive, and your creativity is abetted by anonymity, we need not know your name. That's what democracy is all about.

Rules: you must identify your make of computer. You are to vote for three (3) games released in calendar year 1983. Candidates and winners from last year's long list of immortal all-time bowsers are not in the running.

Postmark deadline: February 15, 1984.



The Honorable Dan McCorquodale
Member, California State Sena
100 Paseo De San Antonio, Su
San Jose, California 95113

Dear Senator McCorquodale:

Thank you for forwarding
Mr. James Keister, Manag
Store wherein you expre
video game "Hard Hat M

I wholeheartedly conc
advertising language
you "...register my
game purports to be
namely the Occupat

I appreciate your
the Occupational
afford to workir
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Cal/OSHA prog

Thank you fe
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STATE OF CALIFORNIA
DEPARTMENT OF INDUSTRIAL RELATIONS
DIVISION OF OCCUPATIONAL SAF
525 GOLDEN GATE AVENUE
SAN FRANCISCO

OCT 21 1983

Is-Nothing-Sacred Dept.:
Is the Bad Guy in This V

THE WALL STREE

Senate
California Legislature

DAN McCORQUODALE
SENATOR
TWELFTH DISTRICT

November 14, 1983

Letters to the Editor
San Jose Mercury News
750 Ridder Park Drive
San Jose, CA 95190

Dear Editor:

"Censorship" to most Americans has a repugnant ring to it. The concept implies the denial of freely expressing thought through art, pictures, speech or the written word. But it is not a black and white issue.

In our society, the gray area can be found in debate about censorship "justified" in the name of national security or standards of morality. It is a tug of war between well-meaning and dedicated factions, each bearing large followings and substantial resources. This is the fodder for insightful newspaper edito

Beyond the gray fringes lie commonly accepted areas of cens libel, slander, child pornography, etc. And, at the oppos reside those rights so ingrained in the Ameri censorship is out of the

Was
In B

H. Bruce Miller

Pulling the P
on video games

MACK ATTACKED!

Judging the Best Computer Game Scandal of 1983 was a piece of cake. When all the ballots were in, it was obviously no contest.

The game: *Hard Hat Mack* from Electronic Arts. The public official: California State Senator Dan McCorquodale, twelfth district. The store: Emporium-Capwell, Santa Clara.

The problem? Emporium-Capwell ran an ad for *Hard Hat Mack* in the San Jose *Mercury News* that referred to the Occupational Safety and Health Administration (OSHA) as "Mack's arch enemy."

For one elected official, this was going beyond the bounds of protocol.

McCorquodale fired off a two-page letter to store manager James Keister, registering his "dismay and disgust" with Electronic Arts's misrepresentation of OSHA. The rest of the letter trumpeted the senator's relationship with "our community's 'Hard Hat Macks,'" and ended with the recommendation that Emporium-Capwell not carry such games. Copies of the letter were sent to nine officials in labor, union, and OSHA capacities (question for Santa Clara County residents: Whose money is paying for the senator's time and postage stamps?)

Electronic Arts spokesperson Terrylynn Pearson pointed out that the ad must have been written by an employee of Emporium-Capwell, since none of Electronic Arts's marketing material or packaging says anything about OSHA being an enemy of the worker.

Emporium-Capwell experienced a corporate myocardial infarction.

Obediently, the store not only pulled the ad from the paper and removed the game from its shelves, but Keister actually *thanked* McCorquodale for the written spanking he sent to the store.

For the press, this was just too good to pass up.

Articles appeared in *The Wall Street Journal*, the San Jose *Mercury News*, San Francisco *Examiner*, and Oakland *Tribune*. The general theme of the articles was, "Doesn't this Public Official Have Any Public Officialing To Do?"

In his response to an article by the *Mercury News*'s H. Bruce Miller, who accused the senator of censorship, McCorquodale defended himself: "I didn't organize a boycott. I didn't demand that the game be removed from the shelves. I simply wrote a letter to the store manager."

But in a second letter to Emporium-Capwell manager Keister, McCorquodale showed another face: "I appreciate your swift action in this matter (removing the game from the shelves)."

Time out.

Senator McCorquodale should be taking some paddle-whackings, not giving them out like two-cent cigars. All his harsh words and poison pen letters were the results of reading an ad. According to the senator's office, he had never even seen *Hard Hat Mack* or its packaging. Never. Ever.

Sharing such whacks should be Emporium-Capwell manager Keister for buckling under the pressure of a letter written on official-looking stationery. If the senator objected to the views presented in a book sold in the store, would Keister pull that book from the shelves?

In the midst of the disk-burning brouhaha, E.A. reported very handsome *Mack* sales, including an order from a construction firm for fifty copies, to be given away as door prizes at a party.

Democracy, boys. Democracy.

MICRO·*Chic*

The new winter line of softwear is here:

Item the first: For vindictive owners of TI computers, the fashionable "I was dumped on by Texas Instruments. I own a 99/4A home computer" T-shirt is available in white with dark blue letters, or yellow, light blue, or tan with dark blue letters.

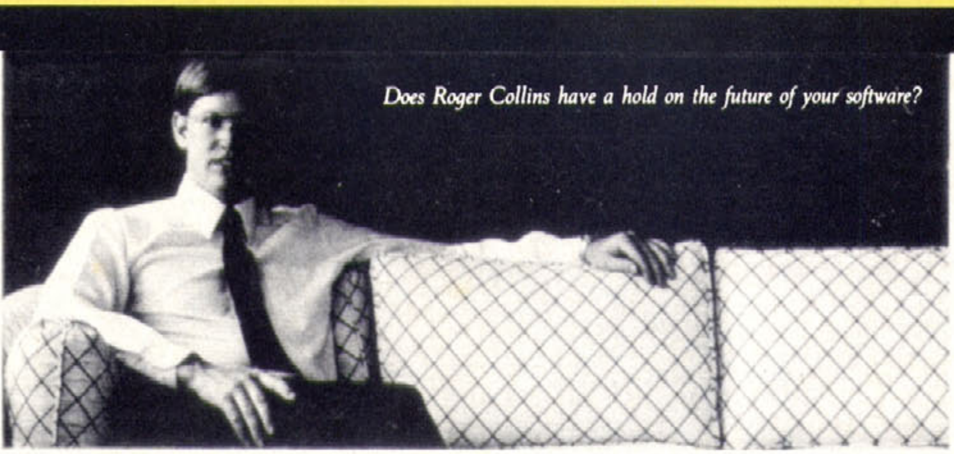
Order from Last Peripheral, Box 44164, Tucson, AZ 85733. Specify small, medium, large, or extra large. White, $8; colored, $9.

Item the second: In response to overwhelming demand, Beagle Bros is now selling T-shirts and golf shirts with the Beagle Bros logo on it. Kids' T-shirts come in small, medium, and large ($7). Adult golf shirts are small, medium, large, and extra large ($17). Inquire at Beagle Bros, 4315 Sierra Vista, Ninetieth Floor, San Diego, CA 92103; (619) 269-6400. Ask for Sophie.

Item the last: The very latest in computer fashions is not another T-shirt. Nope, it's the Computer Tie ($15.95) from Tie-One-On, Box 40225, Philadelphia, PA 19106; (215) 625-2855.

The tie features the words *bit, byte, floppy, hard, RAM, ROM, micro*, and *mini* woven in a navy silk-poly blend necktie. Here's a user-friendly piece of softwear that really talks your language, allowing you to interface your wardrobe with your computer.

Tie-One-On's Mary Gregg says the ties have been selling like crazy ever since ads for them appeared in the *New Yorker* and the *New York Times*. The Computer Tie is the second in Tie-One-On's tie line; the first was the WASP tie, featuring a woven-in wasp, for people who are, according to Gregg, "genealogically pretentious."



Does Roger Collins have a hold on the future of your software?

The Distributor Vanishes. Soon—oh-so-soon—you will walk into the corner five-and-dime, tell the kid behind the counter that you'd like *Wazoo II* for the Sony pvc-78000, and he'll shuffle over to the production station, punch a few buttons, put in a disk, and run you off a copy—plus backup, printed labels, and documentation.

This is called electronic distribution, the brainchild of Roger Collins, founder of Xante Corporation of Tulsa, Oklahoma. Selected citizenry of Tulsa are already giving it a go. If Roger Collins has his way, the system of computer program acquisition as we know it—traditional distributors, merchandise warehouses, mass merchandise outlets, retail outlets, computer stores, software stores, cable network software services, telecommunicated software, mail order operations, and direct sales—will all shortly experience a flash of excruciating pain, double over soundlessly, twitch once, and go to software heaven. Is this the future?

ORIGINS STORY

Every year, for the last seven years, thousands of game addicts have gathered for a long weekend of playing, buying, selling, and arguing about games. It's the national adventure gaming convention: "Origins." Last year it was held in Detroit's Cobo Hall, sponsored by the Metro Detroit Gamers and GAMA (the Game Manufacturer's Association).

One of the convention's biggest features is the presentation of the national adventure gaming awards, ranging from "Best Historical Figures Series" (and other awards for metal miniatures) to awards for the best magazines covering various segments of gaming as a hobby; the '83 awards went to *Space Gamer, Fire & Movement, Courier*, and the *Journal of 20th Century Wargaming*. Well, okay.

There was heavy competition for the award for "Best Adventure Game for Home Computer." In 1982, the winner was Epyx's *Temple of Apshai*, which beat out several Avalon Hill/Microcomputer Games releases. The 1983 nominees were SSI's *Battle for Normandy* (David Landry); SSI's *Guadalcanal Campaign* (Gary Grigsby); Avalon Hill's *Legionnaire* (Chris Crawford); Sierra On-Line's *Ultima II* (Lord British); and Sir-tech's *Wizardry* adventure, *Knight of Diamonds* (Andrew Greenberg and Robert Woodhead). The winner, to great applause, was *Knight of Diamonds*. The Origins awards carry considerable prestige; Sir-tech's already enviable sales can be expected to increase further with this honor.

Among the speakers at the awards ceremony was Atari's Chris Crawford, designer of *Eastern Front* and several other games. He discussed the continuity of the gaming field, from the early boardgames to today's state-of-the-art computer games and beyond.

As the computer game field matures, more crossovers are appearing between computer games and boardgames, and the Origins '83 convention showcased the trend.

Some examples: More game software—both "hard" wargaming and fantasy—appears in the boardgame publishers' display area each year. Bookkeeping programs to assist boardgame players are also appearing. Stores specializing in boardgames are also showing more interest in computer game software, especially software related to existing boardgames. Such adaptations of popular boardgames are appearing more and more often. 1982 saw a *Dungeons & Dragons* program for the Mattel home arcade unit. Now, actual computer adaptations of award-winning boardgames are being announced. Lord British's Origin Software (no relation to the Origins convention) will soon release an Apple version of the *Car Wars* game (new players, November-December 1983), which was named Best Science Fiction Boardgame at the 1982 convention. Adventure gaming magazines—both consumer and trade publications—are including more computer game coverage. Several panels and seminars at the convention were devoted specifically to aspects of game software design.

All in all, Origins has always been a great weekend for the boardgame fan—and it's becoming steadily more interesting to the computer gamer. This year's convention will be held July 5–8 in Dallas, Texas. For more information, send a stamped, self-addressed envelope to Origins 84, Box 59899, Dallas, TX 75229.

—**Steve Jackson**

Let's Give a Really Big Hand

This issue, the award for Best Scene Setting in an adventure game goes to Sir-tech for their new entry, *Crypt of Medea*. The winning sequence is, of course, the early scene in the tunnel, in which the player has an encounter with "a decapitated hand." The sight of the description of this hapless, headless extremity is something no one who has read it will soon forget, and the authors Arthur Britto and Allan Lamb must surely wish to. Really wizard, guys.

Too Long at the 'Fest

O, how tricky becomes our treat, when first we think we're gonna eat.

The 1983 Halloween weekend saw the final convocation of computer companies in San Francisco to observe the hallowed rites of the Applefest. (Future Apple conventions will go under a different name, in a different place.)

On Saturday night, a lot of them bit off less than they could chew.

Details are still obscure; passions still run high; wounds go deep—so we won't name any names. But we have it on good authority that a certain leading Apple periodical threw a party on that night, to be followed by dinner at a local waterfront restaurant. Corporate luminaries from most of the hard- and software companies in the country duly showed up and partied until 9:30 or so. (Unfortunately, there was a malfunction involving the elevator that was the only means of access to the eighth-floor bash, and the publisher was therefore unable to attend. He was not, however, in it at the time.)

Many then wended their way cross-town to the designated restaurant, took tables for fifty, and proceeded to wait.

Orders were taken. Rolls were served. Drinks were served. Salads were served. More drinks and rolls were served. An hour passed. Marketing executives made airplanes out of their napkins. Programmers strolled around the block. Stomachs growled 'neath three-piece suits.

Shortly before midnight, a loud crash was heard in the kitchen and a cloud of black smoke billowed out the door. The kitchen help quickly followed and forced open an exit door for some fast ventilation. The maitre d' announced that the oven had undergone a slight explosion and it would be another half hour before anyone ate anything.

A vague unease spread through the assemblage.

Half an hour later, an associate publisher cornered the maitre d' and learned that the automatic fire extinguisher system had covered the kitchen with chemical goo and rendered just about everything inoperative for the long haul. What, then, were the chances of eating?

"Well," mused the maitre d', "if it's food you're after right now, I guess that I would say you should go somewhere else."

Thus did the Apple computer industry find itself on a sidewalk in San Francisco at 1:00 a.m., flagging down taxis, car-pooling, piling into company vans, and bumming rides off each other, some in search of all-night greasy spoons, the rest just heading for their hotel rooms and the arms of slumber.

The magazine responsible wound up in a great little Italian joint in North Beach and commenced to whoop it up until the small hours of Sunday morning.

The East Coast editor sent his steak back to the chef and told him to do it again.

HOW TO IMPROVE YOUR LIFE WHILE WATCHING TELEVISION

NEW WAYS (BUY SOFTLINE) TO USE (BUY SOFTLINE) THE HOME (BUY SOFTLINE COMPUTER.

I am fun I am lovable I an confident Paul is dead I can quit smoking.

How many of these messages have flashed across your television screen recently? How do you know?

Subliminal messages have been around since the mid fifties, but now they're making their move into the home for therapeutic use. Stimutech of East Lansing, Michigan, has introduced a device called Expando-Vision that, when connected to your television set and Commodore or Atari computer, is supposed to help you reinforce your will to attain self-improvement goals by flashing subliminal messages across the screen while you watch television. Goals include losing weight, controlling smoking, and improving sexual confidence.

"Supposed to help" is the key phrase here. Tests on subliminal messages are inconclusive, and many psychologists question their effectiveness. The psychological community hasn't dismissed subliminal messages, but it is skeptical at best.

Oh, that's great. Wouldn't it be just keen for Fat Freddie to spend all his Christmas money on Expando-Vision (hardware, $89.95; software, $39.95) to help him control his weight problem, only to gain fifty pounds?

Be patient. Wallace LaBenne, a psychology professor and psychotherapist working with Stimutech, says that it takes about three months for Expando-Vision users to change their habits. If it doesn't work, that's okay. Stimutech will let you try it risk-free for thirty days. Hmm. . . .

And how long will it be before Expando-Vision users start playing the messages backward, sideways, and inside out, looking for subliminal subliminal messages?

Photo by Kurt Wahlner

PROFILES IN PROGRAMMING

David Snider

by Matt Yuen

PROGRAMMER DATA SHEET

NAME: David Snider

BIRTHDATE: August 6, 1959 BIRTHPLACE: Cleveland, Ohio

TURN-ONS: Good wine and anything fun

TURN-OFFS: Burnt pizza

GOALS: To travel faster than light

FAVORITE LANGUAGE: Italian

FAVORITE COMPUTER: Apple

FAVORITE ASSEMBLER: I'll let you know when I find it

FAVORITE GAME: Midnight Magic

HIGHEST SCORE: Just under a million

FAVORITE RESTAURANT: Coquelicote Ross, California

FAVORITE ENTERTAINERS: B-52s, Talking Heads, Translator, Robin Williams

WORST CHILDHOOD DISEASE: Chicken Pox (hallucinations, 105°F)

LAST GAMES PLAYED: Drol, Lode Runner, Sabotage, Midnight Magic

It's a good thing David Snider doesn't work for the Department of Defense. Soviet spies would have a field day.

"So, comrade Snider, tell us about those new jet fighters you are working on. Er, not that we really care or anything—heh, heh."

"They're quite simple. You see, they're based on the same technology as our previous fighters, except that they can go underwater, too. I was originally interested in making a submarine that could fly, but it was too hard to design a propeller that would lift the sub from the water."

"Da, da. Have another vodka. And these jets—how is it that they can swim?"

"Well, that's kind of technical. You got a few minutes? Here, look at these physics equations I happen to have. They'll show you everything you need to know about converting aircraft to aquatic vehicles. . . ."

Don't worry, Snider doesn't have any plans to go to work for the Defense Department. Thank goodness. Even if he did, it's not likely that he would spill *everything* he knew to some schmoe offering him a cup of borscht and $4 million a year (to be deposited under an alias in a Swiss bank).

But Snider does like to talk, mostly about computer games. That doesn't seem too surprising; he's been involved with computers for the past twelve years, ever since the sixth grade when he wrote his first computer program—a prime number generator. A far cry from *David's Midnight Magic*, to be sure.

These days, he couldn't care less about prime numbers unless they're in the royalty checks he receives for *David's Midnight Magic* and *Serpentine*, both of which now run on the Apple, Atari, and Commodore computers. All of this evolved from a junior high school kid's prime-number-generating program.

Even as a youngster, Snider knew there wasn't a market for programs that spit out prime numbers, so off to college he went to seek deeper truths about computers, as well as about life in general.

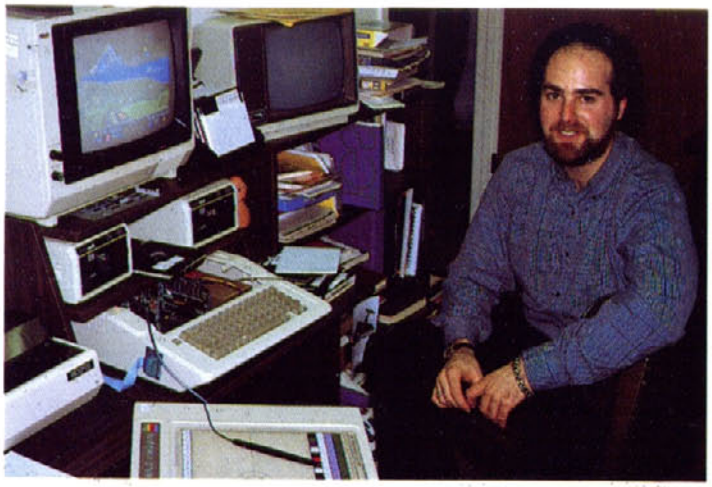
In search of higher education, Snider left the Detroit area for Providence, Rhode Island, where he spent a few years at Brown University studying computer science. After receiving his degree there, he encountered the horrible task of facing the "real world."

When I Was a Child, I Spake as a Child. To most, entering the real world often means finding a job, making some money, and applying for an American Express card. While other graduates churned out resumes, wrote letters to prospective employers, practiced interview techniques, and contacted their alumni associations in hopes of establishing the necessary connections to land a job, Snider sat back and thought.

Once Snider was finished with school, he realized he "needed something to do."

Needed something to do? Boring weekends are when you need something to do. Kids who don't go to summer school or camp are the ones who need something to do. Teachers' pets need something to do.

People like Snider—people who spend four years studying computers at an Ivy League school—don't usually need something to do. They need someone to schedule the recruiters from the technology firms who come



storming the buttresses, screaming six-figure salaries and two-month vacations, with an option to buy part of the company. Back! Get back!

But the thought of donning a suit and tie and selling himself to various computer firms didn't excite Snider, so he thought about trying his hand at writing computer games.

Snider's father was a friend of Allan Emery of Sensible Software, so David had some idea of how profitable the Apple game market might be. Using his family's Apple II, he began teaching himself the inner workings of the machine. Though assembly language was old hat to this programmer, hi-res graphics were foreign to him. Snider knew it would take some time to learn how to use hi-res graphics, but time was something he had lots of.

Time passed. More time passed. Then inspiration struck. There was this programmer out in Piedmont, California, named Bill Budge. He had written a computer pinball game called *Raster Blaster* that was taking the Apple game market by storm. Snider liked what he saw.

"*Raster Blaster* really opened my eyes to the things you could do on the Apple. Most of the games before that were the usual *Space Invaders* games; not too much variation," says Snider. With the pinball image in mind, he set off to create one of his own—*David's Midnight Magic.*

What? Some unknown programmer attempting to emulate the works of the revered Budge? Ha! How could this green newcomer possibly hope to create a pinball game that would even come close to the works of a programmer supreme, whose boots Snider was not worthy to lick? The nerve! The audacity!

But When I Became a Man, I Wrote a Pinball Game. It was neither nerve nor audacity that prompted Snider to write *David's Midnight Magic*; it was the challenge of writing a game—any game. But *Midnight Magic* wasn't just any game. It was a good game, and Snider recognized it as such. His first impulse was to package and market the game himself. It would be easy; just convince friends and relatives to give him a lot of money, and he'd be off and running.

Snidersoft, DaviData, Midnight MagiCorp, or whatever never saw the light of day. At a national computer show in Chicago, Snider ran into Doug and Cathy Carlston of Broderbund, to whom he showed his pinball game. They were impressed. A week later, Broderbund agreed to market *Midnight Magic.*

The relationship between Snider and Broderbund began as a good one, and Snider felt it could get better. That's what helped him decide to relocate from Detroit to California. In Detroit, there are several things a person can do: visit car manufacturers, root for the Lions, shiver, visit Canada, shiver, and drive down to Ann Arbor to root for the Wolverines. Detroit is not a place that's conducive to writing computer games; Broderbund's office in San Rafael, California, is.

You won't find Snider hanging out at Broderbund much, though, since he does most of his work at home. He does drop by the office now and then to check out how things are going and to remind the Carlstons who he is. But they hardly need to be reminded. In the world of computer arcade games, a relative handful of programmers have been able to produce more than one hit. Snider is among that handful.

Midnight Magic came into the Apple market at the end of 1981 and immediately became a bestseller. It couldn't miss; until then, *Raster Blaster* was *the* pinball game for computers. Snider admits humbly and hesitantly that *Midnight Magic* did some things better than *Raster Blaster*, such as not flipping the ball back into play once it's passed the flipper. According to Snider, even Budge liked some things about *Midnight Magic*, things his own pinball game lacked.

Like what?

"Bill said that one of the reasons for including the ball catcher in *Pinball Construction Set* was so he could create *Minute Magic* [an imitation of *Midnight Magic*] and include it as a sample game with the program," says Snider—softly.

Despite his unrestrained willingness to talk about computers and programming, Snider talks a lot more about the development of products rather than the products themselves. His second game, *Serpentine*, is the result of a self-challenge to do more animation than he had done in *Midnight Magic.*

In pinball, the ball and flippers move, and that's about it. The next mountain Snider wanted to scale was that of moving lots of things around on the screen at the same time. *Serpentine* does this, and does it smoothly. The game displays segmented snakes in a maze; the snakes grow longer or shorter, depending on whether they're eating prey or being eaten from behind. Because the snakes are composed of segments, the illusion of their movement is created by moving each segment individually, rather than by adding a segment to the front and taking one away from the end.

Well, Let's Try It This Way. One interesting aspect that was left out of the final version of the game was a "Slinky" effect, in which the body and tail of the snake would catch up and pile up on the head whenever the head stopped moving. Another discarded effect, this one offered by Snider's wife Julia, was having snakes open their mouths and stick out their tongues when they ate frogs or other snakes.

Though it looks like much time went into the design of *Serpentine* as a game, it was really the result of Snider's experiments with various graphics and animation routines. Most of the time, the goal was to learn to make things happen on the screen. After that, the goal was to make them happen faster and more smoothly. Probably one of the most often-used expressions around the Snider house during the development of *Serpentine* was "(sigh) Oh, well."

The learn-by-doing method characteristic of *Midnight Magic* and *Serpentine* is an ongoing thing.

Early in 1983, Snider began working on a game for the Atari (*Midnight Magic* and *Serpentine* were developed originally for the Apple) but put that on hold when Atari began running into financial trouble. Now his attention is turned to a whole new project.

The double hi-res graphics on the Apple IIe present a double challenge to Snider. He wants to take advantage of double hi-res in his next game but acknowledges that double hi-res takes twice as long to move objects around on the screen. The project itself is the one thing Snider won't talk too much about, but he does reveal that he's working on a tool that will make it easier for him to create a game in double hi-res. It will be something similar to what *The Arcade Machine* did for designing arcade games, with the programming technique used in *Pinball Construction Set.*

Fans can begin looking for Snider's next game sometime around early spring of this year. And that's as far in the future as he can predict for himself.

Like everyone else, Snider has dreams and fantasies about what he'd like to do. "Outer space," he says. "I'd love to be able to be in an environment that's totally removed from everyday life. It's becoming more and more possible for civilians to go up in the space shuttle, so you never know. . . ."

Closer to reality, Snider would love to get his hands on "one of those ultralight airplanes and go flying around," but there's just one thing stopping him. "Julia won't let me."

Space shuttles? Ultralight airplanes? Hmm. Maybe he does have connections with the Department of Defense after all.

Don't ask him to talk about it, though. SL

GAMELINE

Gateway to Apshai

By Jim Connelley.

Atari, Commodore 64.

This is a *great* game.

Epyx's *Apshai* series was very well designed, its only flaw being the difficulty involved with remembering and using several keyboard keys during hectic moments of melee. *Gateway to Apshai* offers a variety of commands with just joystick and function keys.

The intrepid explorer's object is to probe (survive?) eight massive labyrinths. The mazes become progressively more dangerous at each level. To maintain the game's freshness, there are sixteen dungeons from which to choose at each level. Because of the sophisticated cartridge design, dungeons appear quickly during the transition from one section to the next.

The player's warrior appears as a small, white figure on the screen. (White makes right, or something to that effect.) Movement corresponds to the four joystick compass points; diagonal motion, though it would be helpful for quick retreats, is not permitted. The warrior begins with ratings of three in each of three attributes: strength, agility, and luck. Perfect health is based on those abilities; the player's health therefore starts at nine.

Careless fighting will deplete a warrior's health and, if the wounds are serious enough, may result in the loss of one of five lives. Healing potions, salves, and amulets undo the damage sustained in furious combat. The attributes themselves are increased through exemplary play or by finding icons (strength stones, agility amulets, and luck charms).

The stalwart adventurer starts his quest with leather armor and a dagger. Most level 1 menaces, which include swamp rats, bats, garter snakes, and slime, can be defeated with that limited equipment. Every room must be explored, however, because subsequent monsters will require better weapons. Daggers give way to short, and then long, swords; leather armor is upgraded to chain and breast armor; bows, arrows, and magic arrows become part of the available armory, and miscellaneous items such as helms and gauntlets further protect the player.

The creatures, unfortunately, also become more powerful. Swamp rats summon neighboring cave rats and rabid rats; bats become large, vampiric, and finally "blinking" (teleporting from one spot to another); garter snakes call their cousins, the asps and mambas; and spiders mutate into poisonous giants. Various humanoid terrors also abound, such as goblins, ghouls, giants, vampires, and ghosts (which, naturally, are invisible).

One important hint: The warrior performs only one task at a time. After unlocking a door, return to the fight mode before entering the next chamber.

Various spells aid the warrior during his quest. Although some have obvious results—the fear spell causes an enemy to flee, and the blast spell reduces a section of cavern to rubble—others are oblique and difficult to understand. None are explained in the sparse instructions, and this is particularly unfortunate when trying to determine the exact use of the confuse, protect, and shield spells.

All creatures approach the player on the shortest straight line. They can therefore be eluded by placing a wall between them and the warrior. The monsters also get caught on corners and can then be killed at minimal risk.

The game has one bewildering glitch. When moving from one level to the next, a shattered player/missile band produces a streak of shimmering white across the status charts. This does not affect the game, but it leaves something to be desired cosmetically.

Gateway to Apshai is an enthralling game for one player. Since occasional menaces can be defeated only with certain equipment, some cleverness is required to determine the proper method. Hours can (and will) be spent unlocking Apshai's secrets. DB

Atari, 16K, cartridge; $39.95 from Epyx, 1043 Kiel Court, Sunnyvale, CA 94089; (408) 745-0700.

St. Hippolyte's Wall

By Michael de St. Hippolyte.

IBM.

The blurb for this game describes it as a "complex challenge that combines the best features of many computer games in a moving puzzle of colors and symbols." Well, yes and no. If *St. Hippolyte's Wall* is complex, then it is complex like go or one of those other games that "takes a minute to learn—a lifetime to master." Since this game has been available for only a little while, it's too soon to tell whether a lifetime will be necessary. The rules, however, require less than a minute. Instead of eat the dots, it's gobble the symbols. Strategy, of course, may come later, but even a three-year-old could master the game's objective easily.

The game is a hybrid of several other types of games. Basically, this is a maze game where you are in competition with the maze itself. The wall is a slender, multihued line that quickly wends its way through the screen like the snake in another popular game. At the higher levels, "guards" created from the loathsome IBM happy face ASCII characters enter the picture.

Graphically, the game relies heavily on color, which is integral to your strategy. You can eat through the wall when you and it are the same color. If you are colorblind, this will prove extremely frustrating. Because of the importance of color, the game requires a color monitor, even though all the symbols are from the IBM character set.

The most annoying aspect of *St. Hippolyte's Wall* is the amount of time that elapses between plays. First you sit through an explanation of the point values for each character in the game. Then there is the screen that displays a picture of a small brick wall and says: "Up. Against. The Wall." Then you watch the characters fill the screen. And finally you get to play the game.

One of the PC's greatest strengths for gaming or any other computing is supposed to be its speed. The action in *St. Hippolyte's Wall* is not particularly fast, but even worse is the amount of time required just to set up a game. If you are serious about mastering all the game's difficulty levels, you will soon tire of "Up. Against. The Wall."

St. Hippolyte's Wall has the feel of a promising first effort that doesn't quite live up to its own potential. With more imaginative graphics, less delay between plays, and a more original concept, this could have been a great game. As it is, this wall could use some shoring up. JB

IBM, 64K; requires color/graphics adapter, color monitor. $39.95 from XOR Corporation, 5421 Opportunity Court, Minnetonka, MN 55343; (612) 938-0005.

Cavern Creatures

By Paul Lowrance.

Apple.

For those of you who have had the opportunity to play Atari's *Caverns of Mars*, you already have some idea what Datamost's new arcade game, *Cavern Creatures*, is like. Those of you who haven't are in for a treat.

Down into the cavernous depths you descend. Your ship, weaving madly to avoid the treacherous rock walls scrolling vertically by, blasts everything in its path. And everything is in your path!

Practically every arcade creature you ever blew away is down there waiting, and some you've never imagined. Your ship, firing in three directions with a satisfying auto-repeat, can hardly miss.

Destroying the "have a nice day" faces or *Pac-Man*'s ghosts is a joy that must be experienced to be appreciated. There are also tie-fighters and *Tron* Recons, disk floppies, apples, stars, towers, cones, blobs, winged vultures, diamonds, hungry mouths, and several sizes of Rubik's Cubes to attack—enough to satisfy almost anyone's electronic blood lust.

There are traps to be avoided as you make your way down the tortuous, twisting labyrinth to the mysterious "Underground City," where even more danger awaits.

Your ship has infinite ammo, and ample fuel is available along the way—just fire at a storage tank to refuel. Best of all, you get ten ships to start with. You'll need them.

The cavern is massively complex, and maneuvering space varies in dimension from nearly full-screen to tiny twisted tunnels barely large enough to squeeze through.

The animation and sound effects are top-notch, as is the wonderfully smooth vertical scrolling.

The title page is also an excellent example of "state of the art" screen scroll. One complaint you could make is that after the game is over, you have to go through a bit of disk maneuvering before you can begin the action again.

Cavern Creatures combines the best action of maze games with the excitement and challenge of the arcade. HAS

Apple, 48K. $29.95 from Datamost, 8943 Fullbright Avenue, Chatsworth, CA 91311; (213) 709-1202.

Murder on the Zinderneuf

By Robert Leyland, Paul Reiche III, and Jon Freeman.

Atari, Commodore 64.

Ever want to take part in a murder mystery? Hardly anyone can read an Agatha Christie masterwork or watch an Alfred Hitchcock thriller, or listen to *Yours Truly, Johnny Dollar,* without trying to form a hypothesis of who the killer is and what the motives were. Then there's always the slapping of the forehead while exclaiming, "Of course! How could I have been so blind?" when the ending is revealed.

Murder on the Zinderneuf takes you back to the thirties and puts you aboard a luxury dirigible as the detective of your choice. You have twelve hours to find the killer before the *Zinderneuf* lands in New York.

To call *Murder on the Zinderneuf* a game isn't quite accurate. It's a little like an adventure, a mystery, and a brain twister all rolled into one disk.

The way you play is much like the way you'd go about solving a murder in real life—you wander around a colorful scrolling map of the *Zinderneuf* shadowing suspects, looking for clues, questioning people, using inductive and deductive reasoning, and sweating a lot.

Looking for clues means searching (read walking around in) various rooms. After a while, either you'll uncover something or the computer will tell you there's no clue to be found in that room. Questioning people is simple. Just run into them and use your joystick to select your style of questioning and tone of voice and whom you'd like to ask about.

Zinderneuf makes it possible for you to play virtually a different game each time. You can select which type of detective you'd like to be from a pool of eight completely different characters, each possessing personality traits that are characteristic of a well-known fictional shamusologist. Each sleuth has his or her own set of interrogation techniques, but different detectives using similar techniques don't get the same answers. Your chances of solving the crime depend on whom you interrogate, how you interrogate them, and what you interrogate them about.

Yes, taking a page from the fantasy role-players' book, you must act in accord with the style and attributes of Miss Marple, Philo Vance, Mickey Spillane, et al., depending on the persona of your chosen sleuth.

Adding to the variety is the number of suspects and possible victims. On board the dirigible are sixteen passengers. Any one of them can be the victim; any one of them can be the murderer. The number of permutations of possible game situations is vast.

If you don't manage to solve the crime in twelve hours (game time: thirty-five minutes), the murderer's confession appears on-screen, along with the motive. If you do solve the murder, you're given a rating based on your efficiency as a detective.

It would have been easy for Free Fall Associates to lean back on the laurels of success from the company's *Archon,* but coauthors Reiche and Freeman would have none of that; instead, they found Robert Leyland to program *Zinderneuf* and came up with a game that's every bit as delightful as *Archon* was.

Some may find *Zinderneuf* frustratingly impossible; others may find it a challenge. No one will find it easy. MTY

Atari 32K, disk. Commodore 64. Joystick required. $40 from Electronic Arts, 2755 Campus Drive, San Mateo, CA 94403; (415) 571-7171.

The Return of Heracles

By Stuart Smith.

Atari.

Of Homer's Illiad and Odyssey
There's a great amount to be read.
For the tomes are quite lengthy
And put many to bed.

The names in Homer's volumes leave much to desire.
They're hard to pronounce and cause many to perspire.
By the time you've pronounced most of the lot
You can't remember the gist of the plot.

Thanks to Quality Software, a new game has arrived
(Requiring an Atari computer with monitor and disk drive)
That's interesting, exciting, and fun
And, thank heavens, it doesn't cost you a ton.

The player is assigned a quest by Zeus and must strive
To complete the assignment while managing to survive.
There's plenty of foes for which one must watch,
They're all out to make sure your adventure's a botch.

One or two players may participate in this game,
Camaraderie helps all remain partially sane.
But even if solo is the preferred way to play,
You can have more than one hero to help win the day.

Three oracles in Greece offer strategy and advice
That help when the gods roll their big cosmic dice.
A map is presented by which you can see
How far you can travel, from village to sea.

Your heroes begin play at differing spots
Find villages and treasure—hopefully, lots.
For armor and weapons (their quality differs),
Cost many a drachma, even for clinkers.

Some of the gateways that lead all around
Are closed by Janus, of the deity crowd.
He'll let you pass after a while
Which certainly causes a player to smile.

When adjoining an enemy, it's your sword that you use
To run him or her through from the head to the shoes.
To wield a dagger you must move in atop
The icon that represents this dangerous clot.

Near the ocean, waves you can hear and see
But this does little to help your brave company.
There's Theseus and Xanthus, Procustes and Sarpedon.
And a serpent strangler, a wrestler, by name, Palaemon.

There are others, like Aellopus the Harpy,
Who attack and dismember quickly and sharply.
There are also the good, such as the winged horse Pegasus,
As well as liars and cheats, like the accomplished Passalus.

Two hundred and forty active characters are contained
Within this adventure, each one maintained
By player or computer throughout the game.
Excitement does reach an entirely new plane.

Lively and colorful, this game possesses a might
To be envied by others who try to share the same light.
The Return of Heracles *is certainly no bust*
And should be considered by gamers truly a must. HGL

Atari, 48K, disk; $32.95 from Quality Software, 21601 Marilla Street, Chatsworth, CA 91311; (818) 709-1721.

Spitfire Ace and **Hellcat Ace**
By Sid Meier.
Atari, Commodore 64.

Flight seems to hold as much fascination for computer game players as it did for the reckless aeronauts of the nineteenth century. Microsoft's breakthrough, *Flight Simulator*, for instance, is the only entertainment-oriented package to have reached the upper echelons of bestsellerdom for the staid old IBM PC.

While Commodore 64 and Atari owners still don't have access to anything as sophisticated as the *Flight Simulator*, they now have *Hellcat Ace* and *Spitfire Ace*, programs that could produce some vertigo in people with a lot of imagination.

Spitfire Ace, as the name implies, pits you, the ace, against a variety of German planes in the skies of Europe during World War II. *Hellcat* throws you against the Japanese in the Pacific. As you begin to play, it becomes obvious that your biggest challenge is keeping the enemy in range. He has a habit of flying around you or dropping behind you. If you don't reverse direction, loop a loop, or deliberately stall, your quarry will escape and the duel will end in a draw. Once you have mastered the basic maneuvers, this is unlikely to happen, but it can be frustrating for a beginner.

Once you learn how to keep the enemy in sight, the next order of business, naturally enough, is to shoot him down. This, too, is difficult at first. The only way to gauge the distance to the other plane is by its size.

BOOK NOOK

Games for Your Atari Computer
By Paul Bunn.

Although it is pleasantly written and easy to understand, the relentless march of technology has, alas, antiquated this book practically at its birth.

Bunn is a 16-year-old British youth, which is reflected in his choice of programs. Most are simplistic and not terribly interesting; many are not even games. Computer magazines routinely publish Atari graphics demos that are far better than Bunn's *Color Pattern* and *String Pattern*.

On the other hand, the book contains three excellent game programs, two of which use assembly language for speedier action. *Ski Run* is the most professional-looking. The player uses a joystick to guide a skier over point-bearing blue flags while avoiding disagreements with numerous trees. *Space Docker* is an outer space variation of all those games that provide a certain amount of fuel and make the player successfully land on or in something. In this case, the target is a huge mothership, and the controlling factor is a failing oxygen supply.

Safe Cracker is a treasure, one of those rare innovations that isn't a duplication of some arcade program. The player is a thief trying to break into Mrs. Warren Fitzdobody's safe. The combination lock requires three numbers. The player has ten guesses for each number; hitting within five either way causes the tumbler to fall with a distinct click. Should the player successfully guess all three numbers, the safe opens and deposits some change. More than ten incorrect guesses signals the police to appear in a barrage of blinking headlights.

Safe Cracker's one disadvantage is the care required to copy the program; it has ten pages of lengthy data statements.

The rest of the programs range from routine to useless. *Decision Maker*, *Morse Code*, and *Compliment Generator* are just silly. *City Bomb* shows poor taste: the player's bomber has developed engine trouble, and the only way it can stay aloft is by dropping its bombs and blowing millions of people to bits! Tacky.

The book itself is put together very professionally. It is spiral-bound, and all the programs are printer transcripts, so there is no doubt that they will work if copied correctly (as opposed to typeset programs, which frequently have poor spacing or other problems). A final chapter, by Dell's computer editor Tim Hartnell, contains a good overview of programming tips designed to help the reader create his own games.

The question, then, is whether the six-dollar price justifies three good programs. Considering the wide selection of material available, better buys can be found elsewhere. DB

$5.95 from Dell Books, 1 Dag Hammarskjold Plaza, New York, NY 10017; (212) 605-3000.

Atari BASIC Faster and Better
By Carl M. Evans.

At first blush, this might appear to be a primer on Atari Basic. It isn't, so don't expect instruction in the art of elementary programming.

It is, instead, an outstanding volume of utilities, hints, and assembly language subroutines designed to increase modest Basic programming skills. With Evans's smooth, friendly style, *Atari BASIC Faster and Better* could become more invaluable than the famous "blue book" by Poole, McNiff, and Cook.

The most useful chapter (and one of the last) explains and lists several utilities. The best surprise is a section that describes, in easily understood steps, how to create an Autorun.Sys file for any program. While most books present that concept in vague generalities that do little for the average programmer, this one covers the subject in sufficient detail.

Next is a disk catalogue program that makes labels to show the contents on individual disks, as well as listings of a complete disk library. "RPMTest" monitors the speed of a disk drive and determines whether it needs to be adjusted. Last, but certainly not least, is a "Mini DOS" that allows the programmer to perform roughly half the DOS functions without leaving Basic. It will format a disk and lock, unlock, rename, or delete a file. Considering the time this saves shuttling from Basic to DOS, this program alone is worth the cost of the book.

A chapter on string manipulation explains left and right justification for use with information that needs to be printed neatly in columns. These routines use the POP command, something not often seen in Basic. Other programs in this chapter reverse a last/first entry on a mailing list, change lower to upper case, or search for a particular string.

Several different sorts, including bubble and shell sorts, are presented in a chapter that explains how they operate. Another section provides subroutines to make a keyboard user-friendly so a program won't crash because of illegal data entry.

Game programmers will appreciate the chapters on sound and graphics displays. The former explains the "envelope of sound," from attack to release time, and then gives a series of sound effects. The latter begins with a neat graphics banner and moves directly into a nicely detailed page-flipping routine showing sixteen different pages of GRAPHICS O text. (It's nice to see something that offers a *useful* purpose for page-flipping, rather than the blinks between random memory pages usually found in such programs.)

The routines are typeset, which may give some programmers pause. All the programs worked that we loaded, but it would have been impossible to test every one.

Aside from that small concern, the book is remarkably well designed. Chapters are put together neatly, and they follow each other quite logically. Several different type faces make it easy to read, and a thick index allows a busy programmer to find a particular entry quickly.

This book is billed as the first volume in an "Atari Information Series." Based on its example, subsequent volumes should be quite worthwhile. DB

$29.95 from IJG, 1953 West Eleventh Street, Upland, CA 91786; (714) 946-5805.

If it's too far away, you're wasting ammunition. Better to build up speed with a dive and come up from below him. Don't dive too low, though; it is distressingly easy to crash into the countryside, and bailing out is impossible unless you think of it long before it's too late.

Occasionally, the other planes will shoot back at you. The border of your screen flashes a chaotic red, and if you are hit your power drops to nothing. All is not lost, however, if you are high enough to bail out or can ditch the plane (easier said than done).

There are fourteen ostensibly different scenarios in *Spitfire*—thirteen in *Hellcat*—the variables being the type of plane that you are expected to blast out of the sky, whether it's day or night, and the altitude at which the enemy can be found. Three difficulty levels provide varying degrees of evasive action on the part of the other planes. At level three, you are hard put to keep the enemy in your sights long enough to take a shot.

The games' graphics are extremely simple, which means that players who use a television set will be able to see the enemy planes reasonably well, although not as well as on a color monitor. The sound effects are good, but like many sophisticated sound effects, they are untenable as transmitted over Commodore's RF modulator. They add much to the game, however, over a monitor or stereo hookup. Downing a plane produces a few bars of "God Save The King," while your own demise is greeted with "Lili Marlene."

The game saves high scores, but be sure you don't purchase a copy that is write-protected unless you are prepared to cut your own notch in the disk envelope. MicroProse wasn't able to get unprotected disks from its copier. A write-protected disk won't stop execution of the program when it tries unsuccessfully to save a score, but it will make your disk drive light blink. Who can concentrate on shooting down Messerschmitts with that kind of distraction? JB

Atari, Commodore 64; disk. $29.95 each from MicroProse Software, 1 Caribou Court, Parkton, MD 21120; (301) 357-4739.

Mothership

By Al Laity.

Commodore 64.

In each life, there will occur certain events that are ego-shattering disasters. If one has cherished a belief in one's gaming invincibility due to the mastery of several arcade nightmares, there will inevitably come a game that leaves one bereft of all defenses. Reference *Mothership*, a real grabber in the clinches.

It's almost as though the programmer denied the possibility of there ever being a "winner." A total of three screens defy the gamer; progression is built upon experience, and experience upon loss of weight and sweaty palms.

Besides being one of the many "mothership invasion" scenarios, the game is tough. The initial screen finds the enemy mothership parked in the upper left corner of the screen. Something known as the Zarway restricts your starfighter's mobility up and down, left and right, kind of like the robot's shooting gallery in *The Black Hole*. Mother's little drones are birthed by the alien spaceship, and they relish trying to blast you out of the Zarway. It's laser versus laser until either you destroy twelve of them or they get three of you. Despite the fact that you can see their laser beams racing toward you, the correct positioning of your own starfighter is critical in downing the enemy.

Should you manage to dump twelve drones, you proceed to level two. At the top of the screen, something resembling a uvula, called a control pod, must be captured. No longer are you a pilot of a starfighter; somehow you've managed to enter the innards of the mothership, and now it's you versus mutant meanies, renegades from a programmer's out basket. Swift scanners dematerialize you on contact. The documentation states that you can shoot scanners, but success seems limited in that regard.

You initiate this scene on the bottom floor; the only means of transport in the general direction of the top level is a green elevator. Good luck getting there. Those masochistic meanies hide in the doorways and have superior success at grabbing you as you speed by in an attempt to enter the elevator. And just because you manage to ride one elevator partway up doesn't mean you'll have the same sort of success getting to the second elevator at the opposite side of the screen. Problems, problems. Not the least of which is that you must capture the control pod while you're still in possession of fuel, which rapidly depletes itself as you try to accomplish the capture.

The final screen finds you piloting the mothership. Your objective: to render inoperative the home base planet's generators. These are represented by red pods distributed about the planet's surface. Once you've broken through the outer defenses (white orbiting energy pods; four shots apiece required), you can take out the easier red pods. As a slight impediment to your final success, energy torpedoes are fired at you by the planet during this engagement.

As you (if you) progress from scene to scene, you're advised as to your score, current level of difficulty, and your mission for the upcoming scene. You are given three lives to accomplish the goal of base destruction in scene three.

Hereabouts, four joysticks lie crippled—an utter shambles—as a result of recent interaction with the mothership. This one is a mother. HGL

Commodore 64, joystick required. Disk $29.95, cassette $24.95; from Soft-Sync, 14 East Thirty-fourth Street, New York, NY 10016; (212) 685-2080.

Fun with Art

By Steve Brightbill.

Atari, Commodore 64.

Wouldn't some assistance in creating graphics on your Atari home computer be a pleasant idea? Or are you one of those fortunates able to make correct decisions regarding such matters as specific graphic modes in relation to the mode's type, appropriate pixel size for your selected graphics mode, or the number and type of colors allowable due to the set screen format?

Well, good for you. For the rest of you, check it out: Your teevee screen or monitor may now equal paint, brush, and canvas. You've got to supply the easel. Works of computer art are now a darned sight easier to originate. No longer do you have to become a competent programmer to create an artistic masterpiece. Don't concern yourself with the number of split or full bytes required to manage a picture. *Fun with Art* provides the software that manages your Atari home computer and molds you into a budding van Gogh or Monet.

Boxes and circles are quickly and easily drawn. After selecting the desired task from the main menu, the cursor is plotted on the drawing screen. Next, the cursor is moved to either the opposite point for the box or a point on the circle's curve, and the trigger is pressed. Presto: There's your box and circle, drawn accurately. No longer will your circles appear as though they were drawn by a tipsy gorilla. Similar methods hold true for moving images within blocks whose dimensions are specified by the user. Such block moves produce image transfers, image duplication, upended or mirrored images, as well as a zoom capability. This function magnifies the image within the targeted box eight times, allowing you to edit your particular drawing, smooth out the rough areas, or perhaps draw in some new features.

Colors—128 of them—give the artist wide range for producing whatever effects he or she might wish. Use of the select key produces sixteen colors, with the option key allowing for eight varying shades. Color priority, a magnificent feature, decides which color may draw over, or under, another color. Both large and small text can be incorporated into any picture.

Once on the drawing screen, there's no need to return to the main menu to select a different design mode. Just type the first letter of the mode you want, and you're ready to roll. Of course, there are some limitations. For example, only four colors may compose each horizontal line that crosses the screen. For those with a disk drive or cassette recorder, pictures may be saved. Such utilities as the actual saving, loading, and editing are all handled through the main menu. A simple guide to incorporating your pictures into a Basic program is included.

Your artistic capabilities are limited, unfortunately, by the brand of joystick you possess. Some joysticks are far easier to use and maintain a high maneuverability factor. Others are just plain disastrous. It's a shame that a product with such high potential as *Fun with Art* must rely so heavily upon another company's product for user satisfaction. A keyboard interface routine would certainly enhance *Fun with Art*.

Don't expect architecturally correct blueprints with *Fun with Art*. No one can manipulate a joystick that well. Do expect to build hi-res pictures with far more ease than you may have thought possible. HGL

Atari, 16K. Commodore 64. Cartridge; $40 from Epyx, 1043 Kiel Court, Sunnyvale, CA 94089; (408) 745-0700.

The Coveted Mirror

By Eagle Burns and Holly Thomason.

Apple.

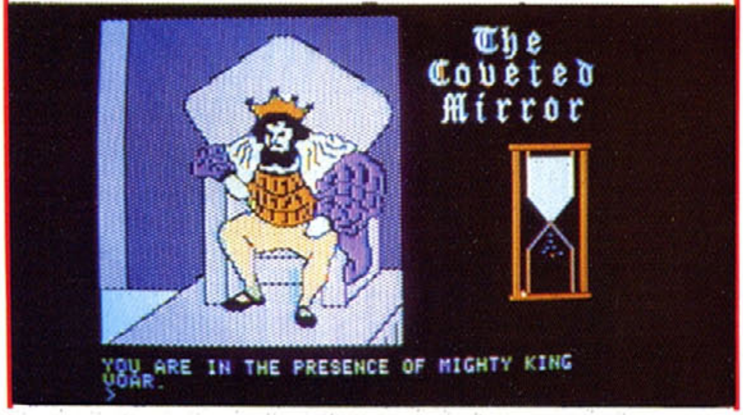
"Unbelievable!" — Grandmaster J.

"It joust blew me away."—Hy-res Grafix

"Xbvc oaishf swov."—Alexei Tommervik

With reviews like these from a dungeon master, a graphics wiz, and a character in the game, this one speaks for itself. From first scene to last, *The Coveted Mirror* is a great balance of magic and mystery.

The object of the game is to overthrow the tyrant king Voar by recovering the five shards of the coveted mirror. This game has something for the arcader, the adventurer, and the puzzler. It is truly a well-rounded adventure.



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YOU ARE IN THE PRESENCE OF MIGHTY KING
VOAR.
>
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The parser is as intelligent as it is understanding and compassionate, giving helpful prompts in the event of misunderstandings, use of the wrong approach, or the wrong word. It gives little shoves in the right direction when problems arise.

The game uses true logical progression: The adventurer must display certain feats of physical and intellectual prowess by completing arcade- and quiz-type screens before he can accomplish other tasks ostensibly requiring such traits.

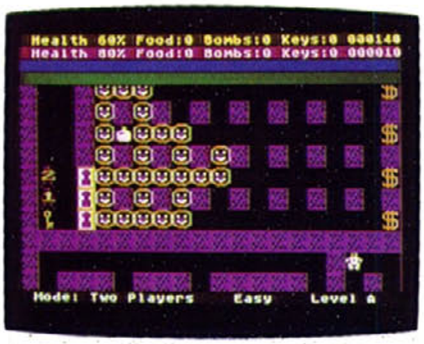
There are arcade-oriented scenes, remarkably well done yet nonviolent: a joust between the adventurer and the local champion (great for little kids—no blood and guts); a fishing derby at a magic pond that tests your ability to judge certain situations and adjust your fishing pole; and a follow-the-leader-type game that tests your memory as you attempt to learn sign language. There are quiz-oriented scenes as well. To obtain a telescope, you must identify some simple constellations. Then it's time to play "Jeopardy" (without your host, Art Flemming), identifying a puzzle picture starting with one piece. Each wrong answer yields another piece of the puzzle. If you answer correctly within a certain number of turns, you may receive a specific item.

Instead of wasting space on grandiose animation routines, the authors (endlessly patient when it comes to answering the questions of reviewers) have introduced something new to the graphic adventure world: subtlety. They have tastefully used very small-scale animation to obtain realism not seen heretofore in graphic adventure games.

There is one minor flaw: The authors, in striving for aesthetically pleasing pictures, at one point capture the grace and beauty of the elk in depicting a moose-head wall trophy. It just ain't no moose.

What it all adds up to is probably the best graphic adventure of the year. This game should provide thirty to fifty hours of solid play, depending on player proficiency and persistence. JP

Apple, 48K; disk. $19.95 from Penguin, 830 Fourth Avenue, Geneva, IL 60134; (312) 232-1984. SL



```
Health 60% Food:0 Bombs:0 Keys:0 000140
Health 80% Food:0 Bombs:0 Keys:0 000010
Mode: Two Players      Easy     Level A
```

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ASM 20

Floyd of the Jungle
By Sid Meier.
Atari, Commodore 64.

Edgar Rice Burroughs could be blamed for initiating the public's craze for jungles and all sorts of things viney and apish, reaching a peak when the first silent Tarzan movie flickered across neighborhood screens. Many have since donned the loin cloth of the celebrated Ape Man, but it took MicroProse Software—and a lot of guts—to present *Floyd of the Jungle* to adoring computerphiles.

Floyd is a bird-eating, vine-climbing, pygmy-punching jungle know-it-all whose sole mission in life is to save what the documentation calls "lovely Janice." As the graphics employed in this arcade game are rather rudimentary—perhaps primitive is the appropriate word—Janice appears to be nothing more than a largish red blotch, usually located near the top of each game screen. You can tell that Janice is Janice by the fact that the blotch waves appendages and shakes a robotlike square head from side to side.

The jungle caretaker is no graphic treat, either. Nor are the little red pygmies or jungle birds. Fortunately, the elephants, alligators, and tigers are discernible as such, and a jungle vine (red?) is thinner than a snake. (It wouldn't do to grab the incorrect species and then pray for anti-venom serum.)

Two may play at the same time. Difficulty arises when both the players' Floyds are doing their respective things in close proximity. You can't really tell one from the other. What's surprising is the fact that *Floyd of the Jungle* is addicting, despite its graphic display. Once under way and running through the jungle underbrush, Floyd is responsible for saving Janice. (He really must be blind!)

Jumping over snakes, climbing vines, vaulting over tigers and alligators, avoiding the pygmies' poison darts, and keeping out of the elephants' way takes a great deal of concentration if rescue is to succeed. The second screen provides for a river, necessitating that Floyd become a master navigator to cross to the other side and continue his quest. A total of five screens provides for great frustration. Experience is by far the best teacher.

A pleasant musical interlude is provided between scenes. (Sound generation during play may leave one wondering just what sort of animal sounds like an accordion being run over by a squeaky steamroller.)

The easy mode gives the player seven Floyds to jump around with, the hardest mode only five. Should a player find Floyd too easy to maneuver, the Jungle Jerk may be handicapped. One or two bad legs do wonders in slowing good ol' Floyd down while vamping with the vines.

The cartoon cover of Floyd's package is available as a poster from the company and should provide many seconds of enjoyment. *Floyd of the Jungle*: gruesome, graphically . . . but enjoyably entertaining. HGL

Atari, 40K, disk; 32K cassette. Commodore 64, disk or cassette; joystick required. $29.95 from MicroProse Software, 1 Caribou Court, Parkton, MD 21120; (301) 357-4739.

Armor Assault
By John Weber.
Atari.

Few Atari designers have blended the genres of war-gaming and computer software, no doubt because of the staggering complexity of the format.

John Weber's *Armor Assault* is a valiant attempt. The game's twelve campaigns are small-scale holding actions and divisionary maneuvers, much like the brief scenarios available for Avalon Hill's war game, *Squad Leader*. Execution, unfortunately, does not live up to intent. Because of its reliance on Basic, Weber's program runs much like the lumbering tanks in his game. Even when answering all prompts as quickly as possible, *Armor Assault* takes three and a half minutes to load and draw the terrain for its first scenario.

The campaigns are well designed to balance firepower and maneuverability. "Desert Well" involves the eventual control of a central source of water; in "Convoy," the NATO player must successfully guide at least two trucks through a city while avoiding Russian light tanks. Ambitious players, using the information in the instructions, may develop their own maps and unit sets (vehicles) for new conflicts.

Each turn begins as players plot vehicle movement with a joystick, which is imprecise enough to be a problem. Atari joysticks do not handle diagonals well. Keyboard entry would have been easier and more reliable. Shelling is determined by the number of times the joystick trigger is depressed after each vehicle's moves are plotted. Opportunity fire produces a steady barrage during movement, and direct fire launches a missile at the conclusion of all moves.

After both players secretly plot their moves, the vehicles hop sequentially in a form of simultaneous movement. Watching the battle's progress is exciting. That's fortunate, since one set of orders progresses rather slowly. Battlefield tension builds quite nicely as each player tries to anticipate the other.

The terrain map is a dark grid sprinkled with trees, lakes, mountains, or buildings, depending on the scenario. While *Armor Assault* is billed as a "hi-res" game, that is only a technical truth. Its character graphics have nowhere near the complexity of those found in, say, *Choplifter*. Different vehicles are difficult to identify, particularly when drawn sideways. As a result, tank identification is easier using the statistics that accompany each vehicle as its orders are computed. This information provides an up-to-date summary of firepower, movement allowance, and strength.

Campaigns are designed to run between fifteen and twenty-five turns. There is no triumphant fanfare at the end of a scenario, however; the game will continue until one player presses "Q." That produces a chart giving the final strengths of each vehicle, and the winner is the player with the higher total. That is fine for a melee, but such information is useless in a campaign such as "Convoy." Victory is a function of whether the vehicles make it, and the skirmish should stop if they do. It doesn't.

The whole game must be rebooted after each battle, even if the players wish to repeat the same scenario. That slow load quickly becomes interminable.

Armor Assault's conceptual excellences indicate that Weber is a serious war-gamer. An equally dedicated programmer might have come up with the machine language subroutines and keyboard command option that would have considerably improved this game. DB

Atari, 40K; disk. $39.95 from Epyx/Automated Stimulations, 1043 Kiel Court, Sunnyvale, CA 94086; (408) 745-0700.

Q*Bert
Atari.

*Q*bert* is an amusing arcade game that mixes absurd creatures and cute sound effects. It's also a challenging problem in combinational mathematics, a delight to the eye and exercise for the mind.

The Parker Brothers home computer version, alas, lacks the articulate charm of its larger cousin.

As Q*bert might snarl, "!#?"

That's the major difference in this version: Q*bert does not mutter those expletive-deleteds, such as an electronically whispered "Massafrassapassafrass," when conked by one of the game's many hazards. Instead, a comic book-style word balloon appears with those three punctuation symbols. Just not the same.

Because the critter makes only diagonal moves, somebody decided to rotate the joystick forty-five degrees so the trigger points north. That's not a bad idea conceptually, since Atari joysticks don't handle diagonals well; it does, however, ignore reality. People have been holding those joysticks the same way for eons, and it's asking a lot to expect everybody to change for just one game.

On top of that, the joystick responds sluggishly, ruling out the split-second responses for which *Q*bert* is famed and making a difficult game even harder. Q*bert should hop on a few production heads.

Under player control, Q*bert hops about an Escheresque matrix of twenty-eight cubes, changing their color. Each level shows the color the cubes should be; early on, one bounce per cube does the trick—later, cubes change color several times before arriving at the color goal. On some levels, Q*bert's extra bounces thwart his own purpose, reversing good cubes to wrong colors; on others, colors change only one way. Complicating Q*bert's life are red and purple balls that bounce from the top of the grid to the bottom; the purple ones metamorphose into deadly snakes when they reach the bottom. Contact with balls or snakes squashes poor Q*bert.

Cube color changes, creatures decoyed or captured, and levels completed earn points. Extra Q*berts are given for every fourteen thousand points; how many players start with depends on the level of difficulty chosen. Two players can compete against each other.

*Q*bert*, the home computer game, doesn't have the sense of style of the one in the arcades. The game's still a good one, but the execution just isn't there. DB

Atari. $36 from Parker Brothers, 190 Bridge Street, Salem, MA 01970.

Baldor's Castle

By Martin Kennedy.

VIC, Commodore 64.

Considering the limited memory of the VIC-20, some impressive work has been done on this role-playing fantasy game to bring gamers a rather complex series of mazes covering three castle floors. The colors, though simple, are striking, and the monsters lurking in rooms and corridors are quite imaginative.

The motif isn't new: Gather all the gold possible and still get out alive. The hero starts the game with individual portions of life, power, skill, gold, arrows, and potion. Respond to the attacks of ghosts, orcs, giant bats, demons, purple worms, and green slime (could this dungeon be beneath VIC manor?) by running, shooting arrows, or punching. Running is pretty effective because you can speed up simply by hitting a higher number on the keyboard (hmmmm). Actually, the numbers reflect the number of spaces you move per turn (this hero just got in from Apshai).

The joystick-keyboard combination control required is a bit awkward. For instance, to shoot an arrow, you must hold down the joystick button while pointing the stick in the direction you wish the arrow to fly; unfortunately, you're very likely to move in that direction as well, which can be deleterious to your health. So you end up needing to run like mad, which means reaiming the joystick and hitting a higher number speed on the keyboard and, if there's something coming from the direction you're running in, finding a way to shoot an arrow at it and stop running—ouch.

Killing a monster nets you its possessions, which may be gold, potion, and maps. But goblins steal maps, and potions can be salutary or quite the opposite. It's the Pepsi challenge.

The corridors are curious. Certain moves cause the entire layout to change. This can be a bit distracting, but interesting nonetheless. Sometimes what seems like a dead end transforms into a whole new series of halls and rooms. Sometimes it's just a dead end.

When you make it out of the castle alive, you can save your character to tape. Then you start the next game with the advantages of experience and development.

Once you get the hang of joystick movement combined with quick keyboard response, *Baldor's Castle* is a challenging adventure. Expect to die quickly a few times, then slowly work your way up and out with some gold and your life intact. This game isn't mastered easily, which means you can play it over and over again satisfactorily. PM

VIC-20; 5K, cassette. Commodore 64. $29.95 from Arfon Microelectronics, 111 Rena Drive, Lafayette, LA 70503; (318) 988-2478.

Paris in Danger.

By John Bell.

Atari.

Paris may be in danger, but the folks at Avalon Hill are already in the thick of trouble with this Napoleonic war game.

The disk boots to a woozy rendition of *La Marseillaise*. After a slow minute, the strategic map appears. That chart, which scrolls from the English Channel to Western Russia, is a blindingly bilious yellow. French and allied (Austrian, Prussian, and Russian) forces are represented by their respective flags, which, because of the horrid color scheme, are quite difficult to find.

Paris in Danger is a two-player game; the computer merely crunches numbers and performs bookkeeping chores. Both players use the same joystick, which is a particularly obnoxious feature. Since movement plotting is intended to be secret, players must take turns raiding the refrigerator or otherwise becoming scarce. Because only one-twelfth of the map can be seen at any given moment, some of those thirty-one tiny flags are easily overlooked. Unless a unit's weekly marching orders are changed, it repeats its previous moves. A player who desires a unit to remain stationary, therefore, must order it to do so; otherwise, it will advance to God knows where.

Once the orders are given, the computer scans each of the units while it makes up to nine moves. The screen flips from one unit to the next, too quickly to permit visual comprehension, until all moves are finished; players who squint for a play-by-play are rewarded with a quick migraine.

Whenever opposing forces occupy the same space, combat takes place. The program allows a choice of "Full Fight" or "Short Fight" (not "Tactical" or "Computer," as the instructions claim). The Short Fight mode, handled solely by the computer, is purely statistical. The size of each unit determines a ratio that then yields an immediate outcome. No muss, no fuss, and no fun.

The Tactical Fight, however, is a study in dishonesty. A two-minute wait calls up a small-scale terrain map with units broken down into individual corps. Each of forty-eight subsequent turns is divided into five segments: French and allied movement, French and allied artillery, and melee. There is no simultaneous movement.

Once the battle is resolved and the strategic map called back (seventy-five seconds), the surviving manpower assigned to each unit does not match the melee results! The entire process is ambiguous, unfair, and pointless. Considering the hours required for *one* such skirmish (and a routine game includes forty to eighty of them), players are better off allowing the computer its strictly mathematical decisions.

This ponderous dinosaur is, at best, an unsuccessful imitation of Chris Crawford's *Eastern Front*. DB

Atari, 48K, disk. $35 from Avalon Hill Microcomputer Games, 4517 Harford Road, Baltimore, MD 21214; (301) 254-5300.

Trion

By Greg Young.

Atari.

When a game promotes itself on the basis of being something really special, that is what it had better be. *Trion* is a step backward for the game-software industry. The promise of three-dimensional movement in *Trion* is marginally accurate at best. The graphics barely resemble what they are intended to be, and the 3-D effect results more from imaginative depth perception than genuine perspective.

Eight levels are divided into three sections each: the valley, the tunnel, and the barrier.

The valley is a canyonlike lattice of deep, rocky corridors through which the *Trion* must navigate. Visions come to mind of Luke Skywalker zipping his speeder through the canyons of Tatooine in search of wumprats. This section uses three dimensions better than the others; the downward angle permits flight behind and underneath rocky outcroppings. Amoebalike Silurians dart about in anemic attempts to collide with the ship.

Blasting ten Silurians produces the tunnel and the crudest graphics seen in years. Remember the old *Starship* cartridge that came with the original Atari 2600 all those years ago? Here's a nostalgic reminder.

Last is the barrier; the massive wall-like structure is the game's only challenge. Since it moves rapidly back and forth and contains very little open space, contact is inevitable as it slowly descends to the bottom of the screen. Attacking the wall is pointless, so the player must carefully pick off the barrier maintenance ships that appear from screen left and right.

The cycle repeats itself a little faster at each succeeding level. Even at the top, the first two sections are trivial.

Trion is, in a word, boring. Stuff like this may have worked in the past, but progress has left it far behind. DB

Atari, 32K; disk or cassette. $39.95 from London Software, 374 Wildwood Avenue, Piedmont, CA 94611; (415) 893-1090. SL

Guest reviewers this issue are Derrick Bang, James Bradbury, Hartley G. Lesser, Paul Mithra, Jerry Pape, Jr., and Howard Shore.

HIGH SCORES

HIGHLINES

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

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

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

Next High Scores deadline: 5:00 p.m. PST February 10, 1984.

Play ball!

Yes, the sporting instinct is in the air and spreading across the nation. The need to compete, athletic-wise, has resulted in a surge of computer-sports-games high scores, received here in the offices of *Softline*, the Unofficial Computer Game Magazine of the 1984 Olympics.

Well, of course we're honored; nay, excited; nay, inspired and rejuvenated by thoughts of the thrilling prospect of muscular competition on the field of valor, shoulder to shoulder, relearning the true meaning of sport and teamwork and competition and cheerleaders and George Plimpton and hot dogs . . . but knowing how to take these scores can be a little tricky. Even though **John David Graas**'s dramatic account of his winning game of *Star-League Baseball* had us on the edge of our chairs, as did **Bonnie Graas**'s equally moving letter of verification ("My husband awakened me at three in the morning and said he had something to show me . . ."), computer sports games just tend to have too many completely different (and not necessarily more or less difficult) play modes. So do some flight simulators. (Sorry, **Joey Rumsey**.) Also, what are we to make of a score like 98–14? Is it "better" than 15–0? Still, we do what we can. Our scoring for *Starbowl Football* is a point spread, and a Pro Level winning score will beat the College Level score. All that special consideration for just one game! And

GAME/PUBLISHER	SCORE	PLAYER
A.E. (Apple), Broderbund	241,900	Matt Schwartz, Andover, NJ
A.E. (Atari), Broderbund	*77,700	Bob Albright, York, PA
Action Quest, JV Software	*20/95	Michael Lurie, Lincolnshire, IL
Alien Ambush, Peter Fokos	*105,380	Mike Hammer, Gaithersburg, MD
Alien Defense, Soft Sector Marketing	*1,115,320	Chris Athanas, Poolesville, MD
Alien Invasion, Computermat	*10,880	Arturo Rivera, Coamo, Puerto Rico
Alien Munchies, Gentry	7,950	Theodore Chen, Potomac, MD
Alien Rain, Broderbund	*2,784,900	Lamonte Cates, Chapel Hill, NC
Alien Swarm, In-Home	*1,055,000	Stephen Pitt, Sunnymead, CA
Alien Typhoon, Broderbund	*886,480	Clark Alyea, Bloomington, IN
Anteater, Romox	*250,606	Steve Neufeld, Norwalk, CA
Apple Cider Spider, Sierra On-Line	*1,110,000	Chris MacChesney, Fresno, CA
Apventure to Atlantis, Synergistic	*2,245	Scot Simpson, Bloomington, MN
Arena 3000, Med Systems	*134,650	Warren Benson, San Jose, CA
Artesians, Rena-Soft	*13,178	Thomas Kirk Almroth III, Huntington Beach,CA
Asteroids, Atari	*9,846,020	John Mellott, Orlando, FL
Attack at Ep Cyg 4, Romox	*76,773	Jeff Campbell, La Habra, CA
Attack Force, Big Five	*3,428,380	Chris Athanas, Poolesville, MD
Axis Assassin, Electronic Arts	*568,350	Kenneth Lui, San Francisco, CA
Aztec, Datamost	*Level 8/1,096,486	Peter Meyer, Carmel Valley, CA
Bandits (Apple), Sirius	*1,689,890	James Feinberg, Chapel Hill, NC
Bandits (Atari), Sirius	*188,390	Barry Landgarten, Douglaston, NY
Bats in the Belfry, Phoenix	*3,098	Mark Hessman, Andover, MA
Battlesight, Versa	Level 5/1,260,500	Michael Susor, San Francisco, CA
Bezare, Southwestern Data	*164,602	Carl Webb, Vista, CA
Blackout, MK Systems	224,630	Theodore Chen, Potomac, MD
Blister Ball, Creative Computing	(1 Player) Level 11/1,271	Bruce Mah, Fresno, CA
Blue Max, Synapse	*Novice/30,180	Wade Tweitmann, Hawthorne, FL
Bolo, Synergistic	*Level 9/10,017	Thomas Kirk Almroth III, Huntington Beach,CA
Bouncing Kamungas, Penguin	*18,550	Steve Gazis, Queens, NY
Bristles, First Star	*Level 4/14,130	David Zeve, Dallas, TX
Bug Attack (Apple), Cavalier	*1,000,924	James Feinberg, Chapel Hill, NC
Bug Battle, USA	*23,790	Theodore Chen, Potomac, MD
Buried Bucks, Analog	Level 27/274,231	Mike Kerekes, Colorado Springs, CO
Buzzard Bait, Sirius	*38,360	Jim Surine, Saint Paul, MN
Canyon Climber (Apple), Datasoft	*480,800	Mike Berry, Santa Ana, CA
Caverns of Callisto, Origin	*44,950	Greg Reade, Phoenix, AZ
Caverns of Freitag, Muse	*Level 9/158,142	Donald Stevenson, Shreveport, LA
Centipede, Atari	*5,445,080	John Mellott, Orlando, FL
Chicken (Atari), Synapse	*312,010	Karen Sowell, Jackson, MS
Computer War, EMI	*4,721	Toby Crew, Southbury, CT
Cosmic Fighter, Big Five	*532,110	Chris Athanas, Poolesville, MD
Crisis Mountain (Apple), Synergistic	*367,596	Wei-How Chung, Seal Beach, CA
Crisis Mountain (Atari), Synergistic	*186,403	Frank Pennisi Jr., Walnut Creek, CA
Crush, Crumble, and Chomp, Epyx	*2,393,410	Chris Athanas, Poolesville, MD
Cytron Masters (Apple), Strategic Simulations	*Level 3/27,200	Ken Mock, Walnut Creek, CA
David's Midnight Magic (Atari), Broderbund	*2,924,610	James Feinberg, Chapel Hill, NC
Defender, Atari	*19,005,775	Jeff Griffen, Bellevue, WA
Defense Command, Big Five	*178,390	Chris Athanas, Poolesville, MD
Demon Attack, Imagic	*154,475	Barry Landgarten, Douglaston, NY
Demon Seed, Trend	*32,330	Chris Athanas, Poolesville, MD
Dig Dug, Atari	*797,110	Paul Cunningham, Oklahoma City, OK
Dino Eggs, Micro Fun	*Level 5/326	Andrew Christie, Canoga Park, CA
Dogfight, Micro Lab	*15,510	George De La Mater, Traverse City, MI
Donkey Kong, Atari	*160,800	Craig Millis, Des Moines, IA
Double Trouble, Bez	*130,340	Mark Hessman, Andover, MA
Dragon Fire, Dakin 5/Level 10	*Level 5/972,000	Brian Service, Exton, PA
Drelbs, Synapse	*51,730	Brad Labine, Concord, MA
Drol, Broderbund	*15,595	Buell Hollister IV, Shelburne, VT
Epidemic, Strategic	*783	Alan Chang, Honolulu, HI
ET, Atari	*106,943	Pamela Duke, Lompoc, CA
Evolution, Sydney	*17,284	Mark Hessman, Andover, MA
Exterminator, Winner's Circle	22,469	Theodore Chen, Potomac, MD
Firebug, Muse	10,060	Steven Kahn, Jamaica, NY
Flip and Flop, First Star	*Level 14/16,775	Kevin Moore, Dallas, TX
Flying Saucers, Radio Shack	*1,210	Rajendra Singh, Chapel Hill, NC
Formula 1 Racer, Gentry	Intermediate/53,130	Theodore Chen, Potomac, MD

GAME/PUBLISHER	SCORE	PLAYER
Frenzy, Softape	*105,059	Curtis Weber, Diamond Bar, CA
Frogger (Apple), Sierra On-Line	*53,690	Lance LaRue, Burton, OH
Frogger (Atari), Sierra On-Line	*400,475	Toby Crew, Southbury, CT
Galactic Blitz, Tronix	*16,660	Greg Athanas, Poolesville, MD
Galaxy Gates, Magnasoft	*106,050	James Marcolesco, Villa Park, CA
Ghost Encounter, JV Software	*20/95	Brad Labine, Concord, MA
Gorf, Roklan	*64,530	Bob Albright, York, PA
Gumball, Broderbund	*57,470	Buell Hollister III, Shelburne, VT
Hard Hat Mack, Electronic Arts	*971,300	Chris Amendola, Huntington Beach, CA
Hazard Run, Artworx	*138,830	Brad Sagarin, Camel, NY
Highrise, Micro Lab	*Level 41/60,895	David Hussong, Palmdale, CA
Human Fly, CPU	*225	James Handy, West Chester, PA
Ice Cave, Winner's Circle	Level 5/25,950	Theodore Chen, Potomac, MD
Invasion Force, Computhings	*91,270	Joe Reitz, Barton, NJ
It's the Pits, Sage Brush Software	*47,150	Buell Hollister IV, Shelburne, VT
Jawbreaker II (Apple), Sierra On-Line	*1,348,010	Robert Clark, Clayton, MO
Jellyfish, Sirius	*448,100	Clark Alyea, Bloomington, IN
Jovian, Computer Shack	*29,720	Chris Athanas, Poolesville, MD
Juice, Tronix	*24,210	David Zeve, Dallas, TX
Jump Jet, Avant-Garde	*74,730	Greg Reade, Phoenix, AZ
Jumpman Jr., Epyx	Speed 2/405,000	Ben Cohn, Saint Louis, MO
Jumpman, Epyx	*Loop/Level 25/67,900	J. Ralph Sowell, Jr., Jackson, MS
Jupiter Lander, Commodore	47,300	Chris Chekel, Granada Hills, CA
K-Razy Kritters, CBS	*368,200	Tom Buchmann, New Brighton, MN
K-Star Patrol, CBS	*50,690	Alro Anderson, San Jose, CA
Labyrinth, Broderbund	*210,500	Darcy Higden, Livonia, MI
Lady Tut, Progame	Level 7/5,400	Theodore Chen, Potomac, MD
Laf Pak: Mine Sweep, Sierra On-Line	*9,533	Chris MacChesney, Fresno, CA
Lancaster, Silicon Valley	*12,560	Buell Hollister III, Shelburne, VT
Lemmings, Sirius	*143,435	Jerry Ingram, Drayton Plains, MI
Livewire, Analog	*Level 14/54,300	Mike Kerekes, Colorado Springs, CO
Lode Runner, Broderbund	*Level 357/3,316,375	Patrick Gifford, Eubank, KY
Lunar Leeper, Sierra On-Line	*184,620	Chris Amendola, Huntington Beach, CA
Mad Netter, Computer Magic	*61,746	William Chiang, New York, NY
Marauder, Sierra On-Line	*Level 21/503,600	Clark Alyea, Bloomington, IN
Mars Cars, Datamost	*Level 30/64,670	Brian Ballard, Bow, NH
Match Racer, Gebelli	*86.7 Miles	Mike Kerekes, Colorado Springs, CO
Mating Zone, Datamost	Round 5/1,520	Theodore Chen, Potomac, MD
Megalegs, Megasoft	*19,009	Barry Landgarten, Douglaston, NY
Meteor Mission Two, Big Five	*120,680	Chris Athanas, Poolesville, MD
Microbe, Synergistic	17,016	Bob Enna, Huntington Beach, CA
Ming's Challenge, Micro Fun	*45,250	Buell Hollister III, Shelburne, VT
Missile Command, Atari	*10,985,275	John Mellott, Orlando, FL
Mountain King, CBS	Level 6/78,730	Dean Rekich, Prospect, PA
Mr. Cool, Sierra On-Line	Level 2, Round 12/749,337	Derrick Bang, Davis, CA
Mr. Robot and his Robot Factory, Datamost	*Screen K/113,050	David Zeve, Dallas, TX
Ms. Pac-Man, Atari	*43,380	Carol Matsura, Troy, MI
Nautilus, Synapse	*(1 Player) 154,400	John Mellott, Orlando, FL
Necromancer, Synapse	*204,651	Ron White, Great Barrington, MA
Night Crawler, Softape	289,407	Michael Tsao, Watsonville, CA
Night Mission Pinball, SubLogic	*749,653,240	Eric Gustafson, Eugene, OR
Nightfall, Omega	*Level 1/14	Craig Morris, Menlo Park, CA
Nightmare Gallery, Synergistic	*423,450	James Feinberg, Chapel Hill, NC
Norad, Southwestern Data	*Level 2/14,840	Wayne Karolow, Danvers, MA
Odyssey, Synergistic	*1,173,400	Casey Lamson, Tucson, AZ
Oil's Well, Sierra On-Line	*Level 2/15,860	Kevin Moore, Dallas, TX
Outworld, Tensor Technology	*102,930	Steve Gazis, Queens, NY
Pandora's Box, Datamost	*33,750	Colin DuPlantis, Bloomington, IN
Pathfinder, Gebelli	*26,271,422	Mike Buchmann, New Brighton, MN
Pest Patrol, Sierra On-Line	*Level 29/10,462	John Sullivan, Alvord, IA
Phaser Fire, Datamost	*9,305	Mike Kerekes, Colorado Springs, CO
Pillbox, Lord of the Games	30,700	Neal Naydo, Monterey Park, CA
Plasmania, Sirius	2,280	Theodore Chen, Potomac, MD
Pole Position, Atari	*Level 1/101,650	Toby Crew, Southbury, CT
Pollywog, Top Notch	*294,765	Matt Yuen, Van Nuys, CA
Pooyan, Datasoft	*833,000	Jon Salmon, Washington, IL
Popeye, Parker Brothers	*118,560	Barry Landgarten, Douglaston, NY

in real life, neither of the above-mentioned scores would be favored over the other—winning is winning and losing is losing. Only a bookie would make a big deal out of the point spread. That makes your old scoremeister feel so cheap and furtive. A rule of thumb when you get a high in one such game is to revel quietly in the satisfaction of your personal achievement and leave it at that. You know you won.

Furthering the spirit of sport, however, "I have a suggestion that would perhaps eliminate some of the cheaters," volunteers **James Handy**. "On all games like *Cannonball Blitz*, where the score was obviously accumulated on the first level over a period of at least four hours, you should have the person send in his I.Q. along with his score, since only an idiot could endure jumping over cannonballs for over four hours without going insane." (The people at the *Guinness Book of World Records* had the same problem. Finally, they told everyone to stop doing all that crazy kind of stuff because they were just going to ignore them.) Handy honorably notes that he should talk, as he holds the *Human Fly* high score, "not exactly my highest intellectual endeavor." That's why we ask that scores submitted include the level on which they were achieved. A lower score on a higher level always beats a higher score on a lower level.

Anybody who doesn't believe the score of American Airlines captain **H.A. "Link" Dickson** on *Serpentine* may make an appointment to view his nine-page document of play progress and screen symbols, on file at these offices.

Taking the direct approach to score dispute settlement and ending the divisible-by-nine brouhaha, former *Bolo* recordholder **T.K. Almroth III** retook the record, forcing his mother to admit she had made a typo when she sent in his original score.

Jeff "I Beat Norman Fong" Griffen got his *Defender* high after leaving the Atari on for two weeks and coming back to it, and after having gone through three cartridges to get one that would boot. The score arrived Special Delivery and included a screen shot (a mounted slide) of the last score photographed, which is some 790,000 points under his actual final score, but a power outage wiped everything out and he was unable to take another picture, so that's the one we're printing. Don't challenge it. Really.

Matthew Russotto reports little bload and Monitor tricks to "fix" *A.E.*, *Cannonball Blitz*, and *Alien Ambush* that he saw printed in a local computing journal; he suggests that all these games be kicked out. We tried that once, but the more we dug, the longer the list grew. Too many games have those cheat keys, left in by programmers for ease of testing. We'd have to kick out most of the games in these lists. We prefer to see documentary proof.

Chris Muhlstein sent in a score of 1,318,500 for *Return of the Galaczians*: "A personal, and, as I view it, a high score for your magazine," says Muhlstein. It's not that we doubt his word, but we would like a little more evidence that a game by that name in fact exists, as we have never heard of it and can find no official record of it. **Reginald Greene** reports a score of 37,300, level 1, on an Activision game, but he'll have to tell us on just what game he got it. Do let's read the instructions at the beginning of this column, hmm?

Theodore Chen would like to know how **Mike Elliott** got 87,083 in *Lazer Maze*, which scores in increments of 10.

A question of manners: **Brian Whitworth** got his mom—who had the flu and was under medication—out of bed to witness his *Miner 2049er* score. Then he phoned it in. And there is no verification by telephone. Then there's the martyred **Steve Cloutier**, who perished in the upgrading of the 86,431 in *Sabotage* to a dubious 99,893. "It's the same old story," sighs Steve, "waking up your mother or father to verify a score. But in this case, in addition to not verifying my score, my dad game-grounded me for two weeks." Even though all six of Artsy contest winner **Aron Danburg**'s scores were too low, he quietly and courteously had them all individually verified and then cautioned us to "please take into consideration that these are family members who are signing to back up my integrity." There is a gamer and a gentleman.

"One last question," queries **Andy McFadden**: "If *Nightcrawler* was never publicly available, then where did all of the people who keep writing and asking if you'll accept their scores get their copies? Are you accusing a member of Softape of piracy?"

And on that note. . . .

It's time once again to spin last issue's scores around and let the bucks fall where they may. It's a cool $50 apiece this time, to lay away for all the upcoming artificially intelligent games.

And the winners are:

Apple: Brian Service, *Dragon Fire*
Atari: Bob Albright, *Astro Chase*
Overall: Brian Ballard, *Mars Cars*

Confirm your existence and state your full address, guys, by writing to Softline Winner, Box 60, North Hollywood, CA 91603.

Keep 'em gaming! SL

GAME/PUBLISHER	SCORE	PLAYER
Potholes, Computer Gazette	*1,060,710	Arturo Rivera, Coamo, Puerto Rico
Preppie, Adventure Int'l	*140,120	Kermit Carter, Boise, ID
Preppie II, Adventure Int'l	*Level 5/69,850	Mike Kerekes, Colorado Springs, CO
Protector II, Synapse	*36,800	David Perrigan, Norwalk, CA
Q-Bert, Parker Brothers	*130,940	Barry Landgarten, Douglaston, NY
Qix, Atari	*727,794	Paul Cunningham, Oklahoma City, OK
Quadrant 6112, Sensible	*300,100	Clark Alyea, Bloomington, IN
Queen of Hearts, SSI	*697,600	Theodore Chen, Potomac, MD
Randamn, Magnum	*7,510	Buell Hollister III, Shelburne, VT
Rear Guard (Apple), Adventure Int'l	*321,475	Peter Alyea, Bloomington, IN
Repton, Sirius	*9,874,650	Keith Armonaitis, Rochelle Park, NJ
Rings of Saturn, Dakin 5/Level 10	Level 4/636,968	Pat Volk, Pittsburgh, PA
River Raid, Activision	*46,750	Barry Landgarten, Douglaston, NY
Roadblock, SubLogic	374	Theodore Chen, Potomoc, MD
Robot Attack, Big Five	*27,380	Chris Athanas, Poolesville, MD
Robot Battle, Universal	*8,153,600	Robbie Faltens, Alamo, CA
Robotron: 2084, Atarisoft	Wave 10/120,100	Theodore Chen, Potomac, MD
Roundabout, Datamost	*Round 8/5,860	Theodore Chen, Potomac, MD
Sammy Lightfoot, Sierra On-Line	*69,120	Chris MacChesney, Fresno, CA
Sanitron, Winner's Circle	13,390	Theodore Chen, Potomac, MD
Scarfman, Cornsoft	*410,750	Chris Athanas, Poolesville, MD
Sea Dragon, Adventure Int'l	*463,200	Doug Zavodny, North Hollywood, CA
Seafox, Broderbund	*202,850	Elizabeth Crowe, Saginaw, MI
Sentinel, Med Systems	*64,450	Tom Myers, San Jose, CA
Serpentine, Broderbund	*Level 275/75,433,900	H.A. Dickson, Dallas, TX
Shadow World, Synapse	*111,200	Robert Proudfoot, Long Beach, CA
Shamus: Case 2, Synapse	*268,400	Gwen Parker, Newport, RI
Sheila, H.A.L. Labs	*155,917	Scott Brown, Riverside, CA
Shooting Gallery (Atari), Analog	*28,620	Pamela Duke, Lompoc, CA
Sneakers (Atari), Sirius	*Level 5/76,402	Frank Pennisi, Jr., Walnut Creek, CT
Space Album: Asteroids, California Pacific	7,212	Kyle Naydo, Monterey Park, CA
Space Eggs (Atari), Sirius	*4,740	Michael Zenner, Portland, OR
Space Kadette, Funtastic	*1,194	Rajendra Singh, Chapel Hill, NC
Space Station Zulu, Avalon Hill	Level 1/786	Roe Adams III, Hyde Park, MA
Spare Change, Broderbund	*Level 37/1,397,090	Amy Hollister, Shelburne, VT
Spectre, Datamost	22,600	Martin Hrovat, Slidell, LA
Spider Raid, Insoft	6,700	Michael Susor, San Francisco, CA
Spy Strikes Back, Penguin	*5,321	Buell Hollister IV, Shelburne, VT
Starbowl Football, Gamestar	Pro Level/43	John Jakubik, Baltimore, MD
Star Cruiser, Nasir	*34,280	Tom McDonald, Huntsville, AL
Stellar 7, Software Entertainment	26,920/Draxon	Ron Raffaelli, West Hollywood, CA
Stickybear Bop, Xerox Educational	Level 5/265,300	Michael Susor, San Francisco, CA
Stratos, Adventure Int'l	*Expert/91,100	Mike Kerekes, Colorado Springs, CO
Super Bunny, Datamost	89,980	Steve Gazis, Queens, NY
Super Puckman, ADO Software	*80,010	Stanley Chen, Potomac, MD
Survivor, Synapse	*(2 Player) 332,760	Alro Anderson and Dave Hildebrand, San Jose, CA
Swashbuckler, Datamost	*6,702	Frank Pennisi, Jr., Walnut Creek, CT
Tail of Beta Lyrae, Datamost	*Sector 5/12,622	David Zeve, Dallas, TX
Talon, SE Software	*114,500	Mark Hessman, Andover, MA
Tanktics, Avalon Hill	*911	Jeff Zeissner, Fountain Valley, CA
Target Command, Computermat	*28,860	Arturo Rivera, Coamo, Puerto Rico
Teleport, Cavalier	*Level 61/69,750	James Feinberg, Chapel Hill, NC
Thunder Bombs, Penguin	*31,890	Laird Malamed, Los Angeles, CA
Thunderbird, Urban Software	*1,000,800	Brian Hazard, Huntington Beach, CA
Triad, Adventure Int'l	*Level 9/102,870	Anand Kaucherla, Sugarland, TX
Tunnel Terror, Adventure Int'l	*440,890	Brian Service, Exton, PA
Vindicator, H.A.L. Labs	Level 12/56,150	Theodore Chen, Potomac, MD
Viper, RDA Systems	*7,917	Doug Zavodny, North Hollywood, CA
Vortex, Datamost	*48,230	Lee Stafford, Phoenix, AZ
Wall War, Sierra On-Line	*68,940	William Chiang, New York, NY
Warp Destroyer, Piccadilly	*96,540	David Levine, Potomac, MD
Wayout, Sirius	*7	Rod Bonios, Van Nuys, CA
Wizard Of Wor, Roklan	*498,300	Bernard Gagne, Newmarket, NH
Zaxxon, Datasoft	*442,000	Chris Mason, Hinsdale, IL
Zenith, Gebelli	*69,650	Jim Stockla, Shelton, CT
Zombies, Bram	*(1 Player, easy) 1,266	David Zeve, Dallas, TX
Zombies, Bram	*(2 Player, easy) 1,113	Kevin Moore and David Zeve, Dallas, TX
Zoo Master, Earthware	*15,113	Buell Hollister III, Shelburne, VT

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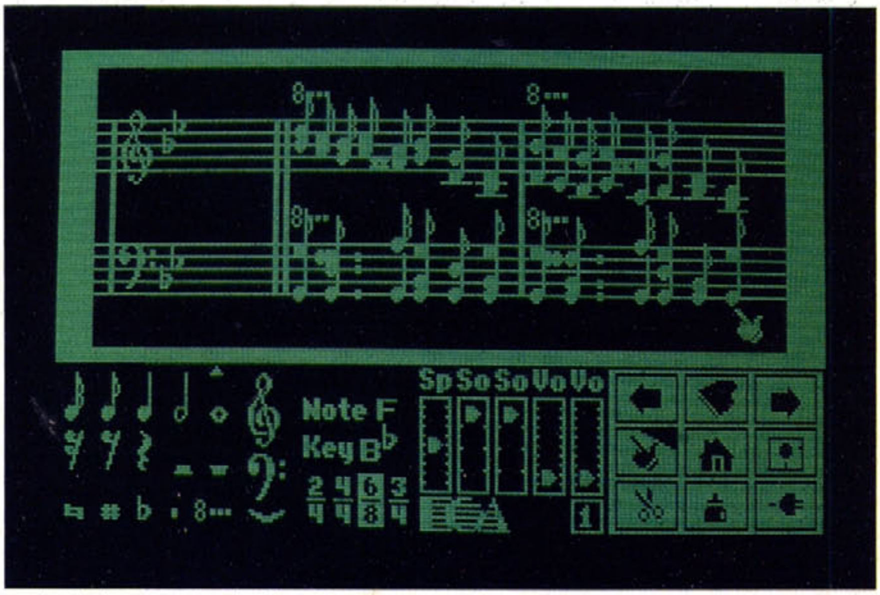

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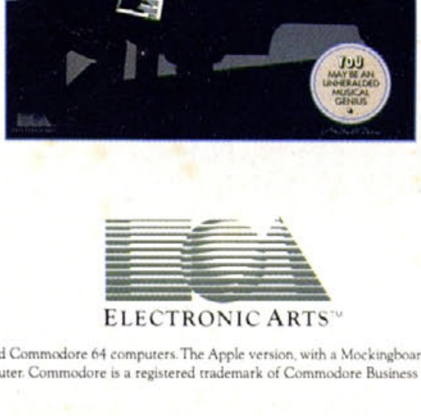

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