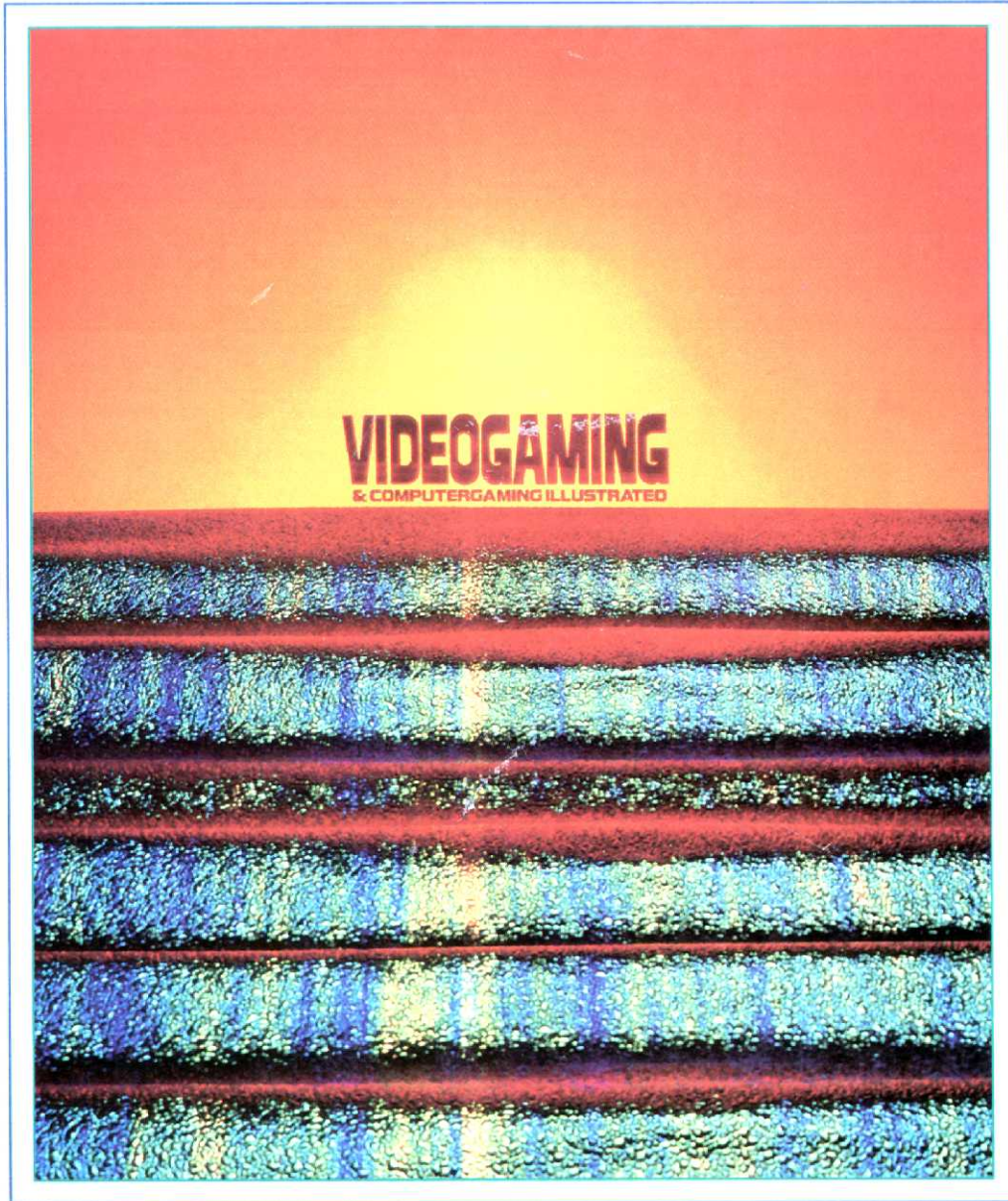


**VIDEO AND
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ION INTERNATIONAL INC. \$2.95/\$3.25 IN CANADA MARCH 1984



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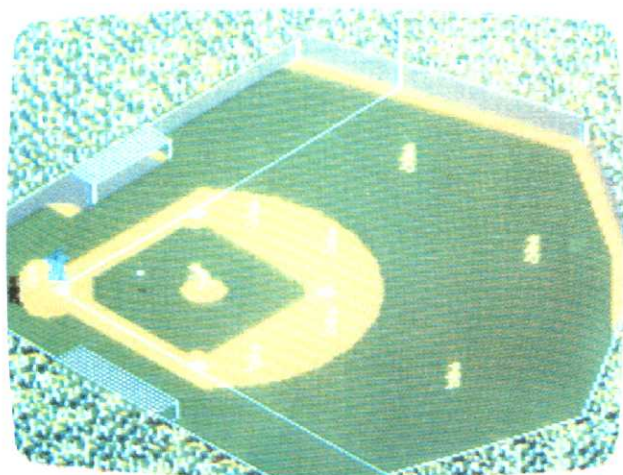
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OF ALL TIME!**



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VIDEO AND COMPUTER GAMING

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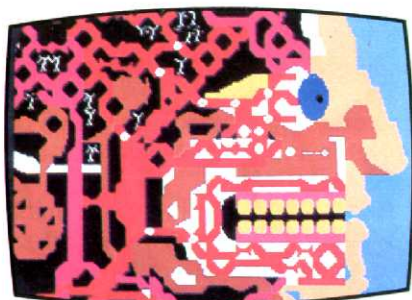
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An Editorial by Steve Springer

A "retrospective"? Isn't that term usually reserved for a loving look back at the career of an artist about to retire, a trend about to subside. . . an industry about to die? Does this issue's cover, with its ominous graphic of our old "Videogaming" logo sinking into the sea, express a conviction on our part that the videogame industry is in more than a prolonged slump—that it is going down for the final time?

The very fact that we're still showing up on the newsstand, proves that we believe no such thing. Videogaming is still thriving—though in a slightly altered form.

The way the industry began, it seemed a sure bet to prosper for many years to come. Certainly, no one expected the kind of growth the business exhibited in its first few years to continue unabated; had that been the case, Atari would quickly have dwarfed General Motors and the industry as a whole approached parity with the nation's GNP. But it was taken for granted that when profits did drop off, most companies would remain lucratively in the black.

Who could have foreseen the many hundreds of millions of dollars lost by Atari and Mattel? Or the devastating (often bankrupting) deficits suffered by smaller companies? Even the arcades, ringing up profits years before the first bouncing ball appeared on a cathode ray tube, reel from falling revenues and closings on a wholesale level.

The arcades have been given a reprieve by the advent of laserdisc and other innovations that have been applied to game design. With or without any more high-tech booster shots, we believe arcades will survive.

And dedicated home video units?

We're not betting our six-digit salaries on that one. The main reason, as our readers are far too informed to need be told, is the arrival of affordable home computers. Considering the difference in versatility, most system buyers or system upgraders are opting for, say, a \$199 Commodore over a \$120 ColecoVision. Manufacturers who stoke the dedicateds must do so with the knowledge that they are producing for a dwindling market. Not a problem faced by the maker of games for a popular home computer that can be expected to increase its user base.

Nor can we underestimate the importance of the rocket-paced new technology just mentioned. The personal computer, with its memory capability far beyond that of the dedicated game unit, will be better able to keep pace. It too will be obsolete before long. But if game manufacturers have learned to live with one unpleasant fact, it is that their industry is one in which you are fortunate to be able to plan two or three years in advance.

We aren't stating that videogames for videogame units are already on the brink of extinction. Just that computers have relegated them to a subordinate position on store shelves. . . on living room floors. . . and in our magazine. More about the changes specific to us in our next issue.

In the meantime, as the industry poises for a great leap forward, we deem it appropriate to look back at where we've been. At the industry's roots in pinball. At advances in controllers. At movers and shakers like Activision and Exidy. At the games that we've chosen as the best. And the ones that we've thought challenging enough to conquer.

For those who take this particular industry seriously—as we and our readers do—a look backward is as important as a look forward. A retrospective, then—a hopelessly incomplete one-volume history of the field that has made it possible for us to meet periodically on grounds of mutual interest.

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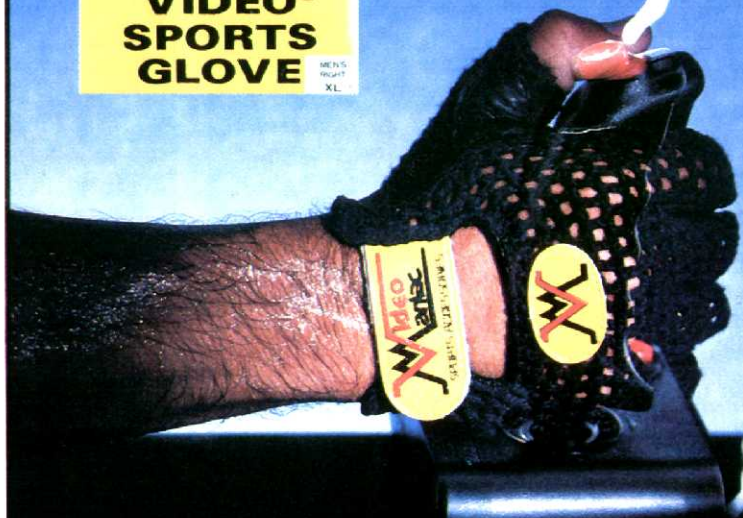
*If you've got your health,
you've got it all!*



Women risk getting certain kinds of cancer. That's why you should talk with your doctor about how you can protect yourself.

Doing monthly breast self-examination and getting regular cancer checkups are good ways to stay healthy. And if you've got your health, you've got it all!

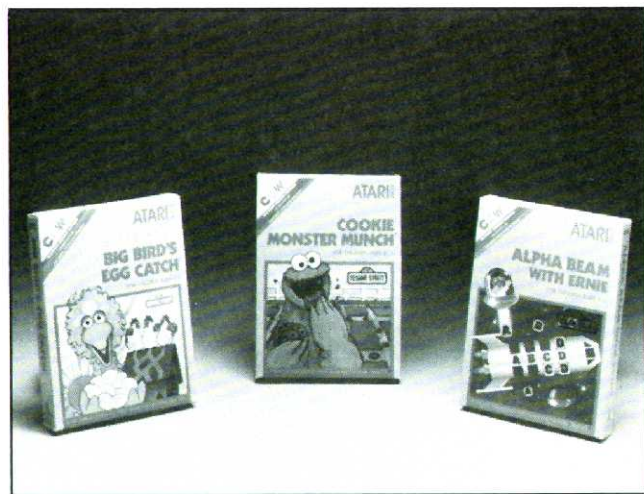
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New Atari/CCW releases starring Sesame Streeters.

HIGH RESOLUTIONS

Did your list of New Year's resolutions include one to spend less time on weekends with the joystick and more time writing that novel, or paneling the rec room, or firming up the midriff? We hate to tempt you away from such admirable pursuits by announcing this month's lineup of new videogames and computergames, but we have a job to do. Besides, as you read these words, it's late January, traditionally the time by which New Year's resolutions, like other holiday trimmings that are dragged out once a year, are packed away and forgotten. If that's the case, don't blame us. If that's not the case, well, we're sure you'll want to take a break sometime.

NEW HOME VIDEOGAMES

For the **Atari 2600**, Atari has co-produced the first three in a series of educational software packages with the Children's Computer Workshop, utilizing the Ses-

ame Street characters. All the games, recommended for kids aged three to seven, are designed for use with Atari's jumbo-sized *Kid's Controller*. Each includes an instruction booklet with read-aloud stories, play activities, and suggestions for parents on how to work with their children on the games.

Alpha Beam With Ernie requires children to pick up floating letters with their Ernie-piloted spaceship and transport them to the craft's four loading docks, each of which is marked with a corresponding letter. When the letters have all been matched, Ernie's spaceship is fueled and he can fly home. In advanced levels, tykes can pair upper and lower case letters, form words, and play timed or cooperative versions.

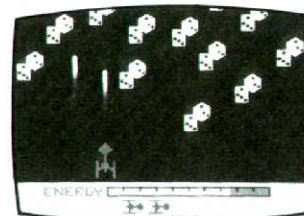
The other two releases have more tenuous claims to the adjective "educational." In *Cookie Monster Munch*, players guide the ladyfinger-lifting fiend through a maze, collecting cookies and placing them in a

jar. This, Atari states, develops visual tracing skills important to reading and writing; and watching the tally of gathered cookies grow teaches number recognition. (Doubtless true—but isn't *Pac-Man* then equally educational, albeit less tailored for preschool minds and fingers?) On advanced levels, there's a timed version and a variation in which the player becomes the Cookie Kid, racing to gather cookies before getting caught by the Cookie Monster.

In *Big Bird's Egg Catch*, the child snares eggs that fall from chickens at the top of the screen. In versions for the very young, the eggs drop slowly, and straight down; on higher levels, they develop zigzag patterns.

A fourth game, *Oscar's Trash Race*, was scheduled for January release.

Newly available for the **Atari 5200** is Activision's *MegaMania*, the



Unpleasant dreams.

tongue-in-cheek space game in which the player must defend against wave after surrealistic wave of steam irons, bow ties, hamburgers, and other such stuff as dreams are made on.

Soon to be released for **ColecoVision** are *Sammy Lightfoot* and *Apple Cider Spider* (described below).

COMPUTERGAMES

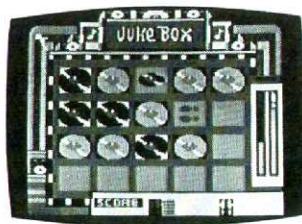
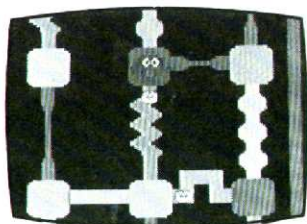
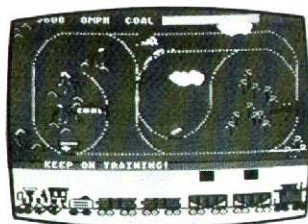
New for the **Atari** computers:

Spinnaker's *Jukebox* consists of a 20-square nickelodeon-encased grid. With a pair of dancing feet, you hop from box to box, making records appear and jumping on them to make them grow larger. Eventually, they will turn gold—but only if you jump when the flashing gold squares appear. One misstep, and the music's over.

Alf in the Color Caves requires four to seven year olds to wiggle a wormlike character down through a crosshatch of colorful tunnels. If the Wufflegumps intercept Alf, it's back to the top of the maze. If he makes it, he changes colors and dances to a tune.

Spinnaker has released *Alf* as part of its Early Learning Series, citing the child's opportunity to learn "the basic skills of navigation, form and shape recognition, and prediction." Sounds like they're outreaching Atari/CCW—that extends the definition of "educational" to every videogame ever manufactured.

Broderbund's *Drol* (comical rescue mission featuring flying turkeys, overweight monsters, and



From Spinnaker for several systems: *Trains*, *Alf in the Color Caves*, *Jukebox*.

magnet-slinging witch doctors) has come available, as promised. Now the wait is on for *Sammy Lightfoot* and *Apple Cider Spider*, described below. Available right now is *MegaMania*, described above.

For the IBM-PC:

Sirius has adapted Williams' *Gorgon II*, in which you fly a spaceship equipped with radar, hyperwarp, and smart bombs into battle with Gorgons that are snatching helpless humans off the face of the earth. That release is on disk, as is *Type Attack*, incorporating 39 pre-programmed lessons into an arcade game format.

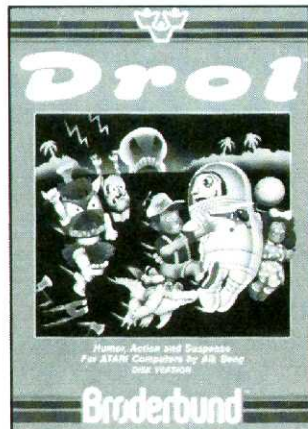
Broderbund's *Lode Runner* (150 original screens, plus game-generating feature) has been released on disk.

The Dark Crystal (utilizing characters, visuals, and plot sequences from the movie) will soon be available.

Trains from Spinnaker (manage a 19th-century railroad, choo-chooing from the mine to the forest to the sawmill to the factory) is scheduled to come available early this year. Their *Jukebox*, mentioned above, was set for January release.

For the Apple computers:

Datasoft has adapted Konami's *Pooyan* arcade game, based on the time-



Comic relief from Broderbund and Sierra On-Line.

less battle of big bad wolves against little pigs. The player glides up and down on a gondola defending the porkers from hungry wolves who float on balloons, hurling deadly acorns at the player's home. Defenses include shooting arrows at the balloons and throwing chunks of meat to distract the brutes. On another of the multiple screens, the player must stop the wolves from ascending a cliff from which they can roll a boulder down.

As repulsive as they are, even spiders don't deserve to be flattened by rolling apples, drowned in apple juice, mutilated by slicers, crushers, bottlers, and cappers, and scarfed up by hungry frogs. So Sierra On-Line's *Apple Cider Spider* asks you to open up your heart to an arachnid and guide him



back to his web in the rafters of a busy apple cider factory. Who knows? Maybe your altruism will carry over to the next time you spot a daddy longlegs on the kitchen floor. For our part, we'll keep stepping on the disgusting things. For the II, II+, and IIe.

The computer age has provided at least two alternatives to running away to join the circus. You can join the staff of *VCI*, and commute to a circus every morning. Or you can play *Sammy Lightfoot*, new for the II, II+ and IIe from Sierra On-Line. Your job is to maneuver Sammy the acrobat across screens of trampolines and trapeze ropes, negotiating rolling barrels, pounding hammers, grinning pumpkins, disappearing floors and tongues of fire. As Sammy completes each stage, he jitterbugs to famous

fifties tunes. With perfect timing, he will reach the magic carpet ride that awaits at the end.

Also available are the abovementioned *Trains*, *Jukebox*, and *The Dark Crystal*.

For the TRS-80:

The Children's Computer Workshop (busy folks of late) have produced three cassette-based games for children aged seven and up. The games comprise their "cooperation and strategy series," encouraging children to share information, divide responsibility, and build on one another's strengths to achieve a common goal.

In *Peanut Butter Panic!*, players jump up and catch stars with which to make peanut butter sandwiches (Peter Pan, no doubt). They must team up to snare the most valuable stars, and share the sandwiches at the end. Player weight, constantly changing, affects jumping ability and requires gamers to plan their jumps carefully.

At the wheel of *Taxi*, players maneuver around street grids based on city



Pooyan: off the pigs.

maps, trying to deliver as many passengers as possible in the time allotted. By playing cooperatively, kids will get an idea of the value of communication and division of labor—if a warped idea of real-life hacking.

Star Trap challenges players to corral shooting stars by blocking their paths and using special maze gates. One player can trap stars, but two working together can do so more effectively.

Finally, Radio Shack has produced an adaptation of *Zaxxon*.

For the **Commodore 64**:

Beach-Head, on tape or disk from Access, poses the challenge of conquering an island-based fortress ruled by a dictator and protected by air, sea, and land forces. As commander of the invasion, you must maneuver your fleet through hidden passages, survive air and sea attacks, and land your amphibious tanks on the beach. You must then thread your way through the island's defense system of land mines, tanks, and anti-tank bunkers up to the fortress. The one-or two-player game features four 3-D screens.

Synapse has adapted *Zaxxon*, claiming that their version will take full advantage of the 64's graphics capabilities.

Figuring that one giant alien menace would not satiate 64 owners, Commodore Software has adapted Bally Midway's *Lazarian*. The game's three missions include rescuing a ship from a swarm of meteors, traveling down the multilevel

Tunnel of Fear, and facing off with the menacing galactic leviathan for whom the game is named.

Other adaptations include Reston's cartridge of *Miner 2049er* (guide Bounty Bob towards gold and away from radioactive mutants and fatal falls), disk versions of Sirius' *Wavy Navy* (dodge bombers and Kamikaze fighters on the high seas) and *Critical Mass* (jet around the world piecing together clues to save the earth's five largest cities from exploding), and *Drol* (mentioned above).

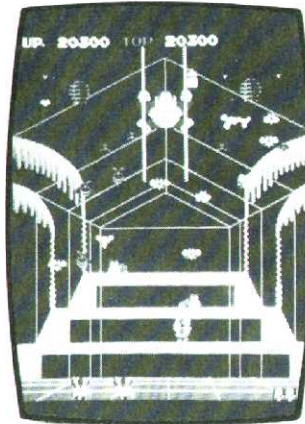
From Comm*Data: the *Gotcha Math Games*, requiring the player to supply correct answers to arithmetic problems in order to complete such related tasks as blowing up alien spaceships; and *English Invaders*, putting grammatical know-how to much the same purpose.

Also available are the previously described *Pooyan*, *Jukebox*, *Alf in the Color Caves*, *Apple Cider Spider*, *Sammy Lightfoot*, and *The Dark Crystal*.

For the **VIC-20**:

Sierra On-Line has released nine games, seven of which are adaptations and two spanking new.

Ultima II: Escape from Mt. Drash has nothing to do with makeup—on the contrary, it involves escaping from a dungeon through a maze of subterranean corridors. The split screen format provides the player with simultaneous bird's-eye and floor-level looks at the action in progress. Working against him are an imposed time limit



Long live the Kong.

and the monsters he encounters along the way.

Flip-n-Match requires the player to demonstrate a memory almost on a level with that of his VIC as he looks behind boxes, memorizes the shapes he finds and tries to locate their twins. In fact, we'd imagine that the game requires a great deal of... concentration.

Adaptations include *Cannonball Blitz* (dodge projectiles as you scale a steep hill to a Redcoat castle), *Jawbreaker* (using a set of teeth, chomp your way through a maze of moving walls), *Threshold* (clear trading routes of enemy spaceships), *Crossfire* (blow away invaders that approach from all directions), *Lunar Leapers* (load your crewmen onto your ship before they're eaten by massive-beaked monsters), *Creepy Corridors* (traverse twisting passageways, collecting diamonds and avoiding creatures), and *Frogger* (what's green and red—THUMP? Green and red—THUMP?... A frog on a radial).

As the great, great grandson of Zorlok the

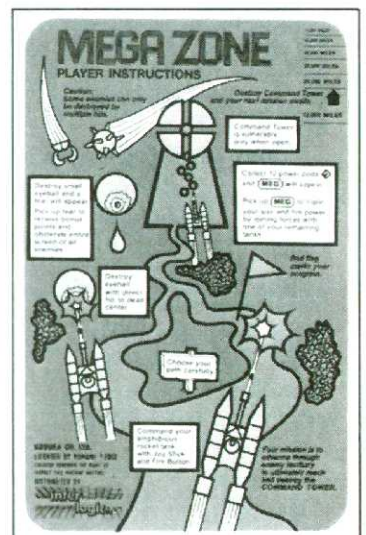
wizard, you have inherited a quest: to enter his castle, wipe out a plague of monsters, and regain his treasures. (Why couldn't the old coot just leave Confederate war bonds?) Featuring multiple skill levels, the Micro Information Systems game is available on tape or disk.

Broderbund's *Sky Blazer* charges you with five different missions to clear away enemy radar, tanks, and ICBM installations, while evading heat-seeking missiles, explosive balloons, and jets.

THE DONKEY'S UNCLE

Nintendo is apparently trying to produce as many sequels to *Donkey Kong* as there were to *King Kong*. *Donkey Kong 3* is the latest ape of the barrel-rolling original.

This time, a coconut-hurling Kong descends a network of vines to reach the greenhouse of Stanley the gardener. Stanley must chase him back up the vines with a spray gun, as well as deal with Buzzbees, Bee-



Mega Zone mapped out.

spys, and Creepies (slow-moving worms) that try to steal his flowers.

The game features three different playboards and four difficulty levels. It will appear in both upright and table versions.

Konami/Interlogic's *Mega Zone* puts you in an amphibious rocket tank which you must maneuver through water and land, bypassing woods and other barricades, to reach and destroy the enemy command tower. Along the way you'll pick up power pods; collecting twelve gives you the chance to triple your size and firepower, necessary for dispatching certain of your enemies.

To round out this issue's arcade news, and to show off our newsgathering prowess, we now report news that hasn't even been *made* yet—about an arcade game in development. We had to pull every journalistic trick in the book to get this scoop (the primary one being, to answer the phone when the game's co-designer, Keats Horstmann, called us). The game is untitled, as it has not yet been sold—but we have a hunch it will be. It allows several players at a time to climb into their own enclosed spaceships with fully operational control panels of over 100 switches. (There is a full training process to make players efficient pilots.) The playfield is a galaxy; players meet there, in their own ships, via their cockpit screens. The "captain" must complete his ship's mission while interacting with friendly

and hostile vessels piloted by live players, as well as with alien planets and star bases. "The players do not compete against a computer chip, but against each other, in real time," says Horstmann. "The computer is invisible, and you think you've really gone into deep space." Don't make it *too* convincing, fellows—players will be afraid to leave the cockpit. For more information, contact G-Comm, 370 East, South Temple, Suite 410, Salt Lake City, Utah 84111.

ARE YOU LISTENING, MR. BLACKWELL?

Why be just another face in the crowd at the local arcade when you can let everyone know that you're a Video Maniac? That's just what entrepreneur Robert Chavez had in mind when he began marketing a line of action sportswear for the fashion-conscious videophile.

His California-based store markets a line of fashion accessories from



Ever wonder what the Beaver is doing today? Neither did we, but our pal Eddie Kessler (center) recently reunited the cast members on his syndicated show.

Muscle T's to long-sleeved sweat tops, all emblazoned with his striking Video Maniac logo. Chavez also offers a joystick glove, black with leather and mesh grips. He's considering offering a second one designed by a doctor to facilitate game-playing.

To reserve your spring wardrobe, write Video Maniac, P.O. Box 2728, Dept. VG, Capistrano Beach, CA 92624.

MOSSAD ATTACK

While we're on the subject of maniacs, what do

you suppose Yasser Arafat's troops do to unwind after a hard day blowing up grocery stores and shooting old women in the back? We were surprised to read in the *New York Times* that many PLO soldiers frequent an arcade called Father Ziad's Place, at the end of the alleyway where their Tripoli headquarters is located. "They lean their Kalashnikov rifles against the walls," reports the *Times*, "and while away the hours at two pool tables, a handful of pinball machines, and several electronic games." Their favorite? Appropriately enough, the urban warfare simulation, *Wizard of Wor*. □



This sweat top from Video Maniac, purveyors of videogame-related sportswear, fits like a glove—a leather and mesh gripped joystick glove.





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Despite the wild claims made by the Blackjack system charlatans, it is not possible to learn an effective strategy overnight. Learning an effective strategy takes time and discipline. If learning a strategy were easy, everyone would be making a living playing Blackjack. As it stands, less than one percent play well enough to make money.

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BLACKJACK TEACHER teaches seven different strategies of varying complexity and accuracy. This spectrum of strategies allows you to select a strategy that suits your needs.

BLACKJACK TEACHER monitors your betting and strategy decisions (hit/stand/double/split/insurance). If your decisions are incorrect within the guidelines of your strategy, the system will display error messages showing you the correct decisions.

BLACKJACK TEACHER is the result of over ten years of Blackjack research. The strategies encompassed by the system were developed using computers. The more complex strategies are among the most powerful ever devised.

Complete documentation is included which tells you everything you need to know to become an expert strategy player.

The SOTA Story

SOTA Enterprises has consistently produced nothing less than the highest quality software. When you buy software from SOTA, we do our utmost to make sure you get your money's worth.

ATTENTION VIC 20 USERS

A new version of BLACKJACK TEACHER is now available for the VIC 20. Although not as comprehensive as the original 32K program, the VIC 20 version does teach Basic Strategy - a must for the Blackjack strategy beginner!

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BUCK ROGERS—PLANET OF ZOOM

Sega for the Atari 5200

Object

You are the 20th-century pilot Buck Rogers, awakened in the 25th century and commissioned to defend the planet Zoom from an alien onslaught.

There are five levels of difficulty. In day and night scenarios you must skim the surface of the planet, navigating through electron posts while battling the swooping alien saucers, space hoppers and, ultimately, the alien Mothership in the trackless void of outer space.

You begin the game with an allotment of three ships. On each level, you must pass a certain number of electron posts before your fuel runs out. You receive points for the alien crafts that you destroy; in addition, the faster you fly the more points you receive and the less fuel you consume.

E.C.M.: You have to be impressed

with the way that Sega has bounced back from their early, disastrous releases. *Buck Rogers* is an excellent game and a probable crowd pleaser.

The uncredited designer has abandoned the arcade game's claustrophobic trench in favor of a wide flat plain dotted with electron posts—a change that does not damage the game a bit. And, rather than just getting faster at each level, the game throws new enemies and new patterns at you.

A certain amount of strategy is called for, though it is of the impulse/instinctive fashion: the player must decide how fast is too fast and find the maximum speed that will accomplish the mission while still retaining control over the ship. Likewise, you're not obliged to pass between the electron posts, but you can get burned if you stray too far, especially with the aliens swarming all over you.

A simple shoot-'em-up, but an absorbing one nonetheless.

Graphics: B-

Gameplay: A-

J.C.: "Absorbing" is a good description for *Buck Rogers*. It is the type of game that will compel you to reach for the reset button as soon as each game ends.

Sega has managed a nice balance of graphics and gameplay: the former are impressive but do not detract from the latter. Little or no strategy is actually necessary, but you spend most of your time racing along far too fast to notice.

One maddening facet of gameplay is the alien ships' mode of attack. They swoop onscreen from behind you in packs of three, invisible and inaudible until they're well within attack range. Your only defense is to cut quickly to the left or right as soon as you sight the nose of the first ship. Sometimes the first ship will be the one to do you in, rendering this defense useless. You will learn to anticipate the attacks and cut a split-second before they occur—also ineffective at times, particularly those times when cutting in time

means wrapping your ship around an electron pole.

Life on the laser's edge.

Graphics: B

Gameplay: B+



CONGO BONGO

Sega for the Atari 5200

Object

You are a hunter in hot pursuit of a mischievous gorilla, reasons unspecified. In screen one, you must climb Jungle Mountain, then cross a chasm and a river while avoiding coconuts and monkeys. In screen two, you must cross a river by hopping lily pads, fish, hippos and islands. When the gorilla, Congo Bongo, has been corralled in screen two, the game returns to screen one at an increased level of difficulty.

Points are accrued for the number of hazards crossed and the number of screens completed within a specified time. The player begins with an allotment of three

hunters.

J.C.: This is Sega's entry into the "cartoon" or "cute" category. Seen in that light, it is an unremarkable, even tired, bid for players' attention and dollars. Judged on its own merits, however, it is a fun game. Young children just might love it.

The recurrent, be-bop theme may drive some players crazy. I happened to like it; it helped propel me on. The graphics, no match certainly for the arcade version, are fully realized, and the touches of humor are marvelous: the way the hunter squirms up precipices too steep to hop, the manner in which a dead hunter ascends to heaven on wings and halo.

Much to the game's credit, gameplay is simple to understand but difficult to master. Screen two is a real challenge, but screen one is not child's play either. Like me, you may go all the way the first time you tackle it and then have no luck whatsoever the next five rounds.

Gameplay: C

Graphics: B

E.C.M.: Jim contradicts himself in his review and in doing so serves our readers ill. Young children probably will not like *Congo Bongo* one bit for the very reason he cites: gameplay is very difficult. And what is considerably worse, it is inconsistent.

Sometimes coconuts passed through my hunter, sometimes they knocked him for a loop. Perhaps it was a glitch in my copy, but very often my hunter simply refused to cross the screen one chasm.

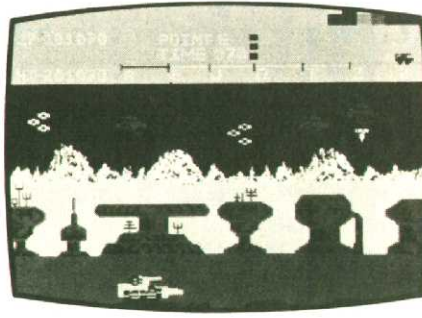
The music *did* drive me crazy. I finally turned it off. The graphics here are flat, though colorful, and do not contribute to the gameplay. And face it: it is tedious to climb Jungle Mountain again and again in order to reach the interesting chasm/river section.

I agree that the game has wit. I particularly enjoyed the gyrations the hunter must perform in order to shake off the pesky monkeys. But *Congo Bongo* is far too derivative and unrewarding to be recommended to any but the wealthy and extravagant.

Gameplay: C

Graphics: B-

MICRO TAKES

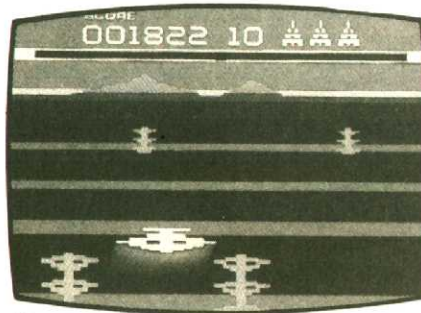


Moon Patrol Atari for the 5200

Object: You are behind the wheel of an armored go buggy, tooling across the lunar space. It's just you against alien spaceships, tanks, and a grueling, pockmarked path. In addition to the vehicle-swallowing pits natural to the planetscape, the enemy vessels can blast holes in front of you.

E.C.M.: Rare is the home videogame whose graphics and gameplay come almost indistinguishably close to the arcade original. *Moon Patrol* fits that description practically as well as anything I've seen. Which translates into one half of an enthusiastic recommendation—for *Moon Patrol* in its original version, while hampered with graphics that were borderline interesting, featured wild gameplay. **B.**

J.C.: As you may remember, I loathed this game in its 2600 incarnation. This rendition I actually enjoyed. Especially the gorgeous background graphics, and the soundtrack that succeeds in setting a playful mood—while incorporating some of the eeriest sound effects I've heard. **B-**



Popeye Parker Brothers for the 5200

Object: Olive Oyl is in the grimy clutches of Bluto, and it's up to the one-eyed sailor of her dreams to

rescue her. Popeye must catch hearts, notes, and cries for HELP! dropped by his sweet patootie from the top of a dockhouse or masted ship while dodging (or pun- ching out) Bluto, the nefarious Sea Hag, and Vultures. Bonus points are gained when Popeye consumes a can of spinach and kayos Bluto before his strength runs out.

E.C.M.: If you're looking for personality in a videogame, this one's got plenty. The music has lilt, the game has suspense; a nice mix of passive fleeing and active pun- ching. **B-**

J.C.: Personality, lilt, suspense? Yes, yes, yes. But the concept behind this game is so old that I found myself getting bored with it quickly. No matter how many amusing elements *Popeye's* designers gave us, they've still got us climbing up and down steps. **C.**

Popeye Parker Brothers for ColecoVision

Object: Same as above.

J.C.: I enjoyed this game more than previous versions. The graphics were crisper and better defined—Bluto in particular being well-rendered. I got a true charge when my spinach-energized swab- by wailed on Bluto. And here, when struck, Popeye leaves his feet and goes spinning into the drink. A splendid touch. **C.**

E.C.M.: Atari won last issue's "head-to-head" with Coleco, *Centi- pede* winning our bipartisan approval over *Slither*. This round goes to Coleco. Unless the programmer of the 5200 version fell down on his job, *Popeye* makes a strong case for Coleco's graphics/gameplay superiority. **B-**

Buck Rogers—Planet of Zoom Sega for the 2600

Object: See above.

E.C.M.: After seeing a total of four versions of *Buck Rogers*, this one looks pale and sparse. But the breakneck pace of the game more than makes up for any fault in the graphics. **C+**

J.C.: Picture *Enduro* with shoot- ing and a *Moonsweeper*-like scroll- ing horizon. Though *Buck Rogers* is not a good or as satisfying as either of those, it's one of the bet- ter new 2600 shoot-em-ups. **C+**

VIDEOGAMING ILLUSTRATED PROFILE
ACTIVISION PRESIDENT

JIM
LEVY



PHOTO BY VICTORIA ROUSE

Activision was formed on October 1, 1979, created to produce cartridges for the home videogame market. It was the first company to manufacture just software for this field, paving the way for the subsequent debut of games-only firms like Apollo and Imagic.

Less than two years after its founding, Activision is generating revenues in excess of \$50 million annually. Industry analysts attribute the company's unparalleled success to its brilliantly conceived and executed games—as anyone who has ever played *Kaboom!*, *Dragster*, *Barnstorming*, *Stampede*, *Fishing Derby*, et al., will attest—and to the leadership of its president, Jim Levy.

A man of diverse experience, Levy has worked for Time, Inc., Hershey Foods, and GRT Music among others. He is an expert in product marketing and corporate management, and is considered by many to be the industry's canniest entrepreneur. He is nothing if not articulate, forthright, and visionary as *Videogaming Illustrated* discovered in this exclusive interview.

Q: What is the source of your own interest in this field?

A: I feel that the personal computer is as fundamental a revolution in the way we entertain ourselves, live our lives, and educate ourselves, as television or any other development we have witnessed in this century, and therefore in all of history. Activision was formed because there was a group of us from the creative and the business standpoint that thought there would be extraordinary opportunities to lead the industry both emotionally and creatively, and to make sure that *where* computers go over the next decade or two becomes a positive force for good.

Q: Activision has shunned licenses in producing its games. Is it a company policy to generate all of your own themes and programs?

A: Licensing is obviously easier, but it's also much more temporal. If you don't have a strong creative center to an organization such as Activision, eventually you're going to fall behind. Historically, if you look at the motion picture industry or the record industry, the successful motivators of change, both creatively and from a business standpoint, are those who have crossed new ground, have pushed back the limits of the art form. That doesn't come from copying something that's been done somewhere else, it comes from original thought and expression and research. Copying something that has been done, even from another medium, is sort of a quick and dirty way to immediate sales and profits. It's also a one-

at-a-time situation: What happens if, next year, there is no *Pac-Man*, there is no *Asteroids*, there is no *Space Invaders*. What happens to the companies which rely on those as being the source of their product? Besides, from Activision's standpoint the creative approach is not only fundamental to the long-term development of the organization, but it's also a lot more fun. You're dealing with new ideas all the time, tinkering and experimenting. Life is full of surprises!

Q: Have there been ideas which Activision has found impossible to conquer, even *with* its obvious pool of talent?

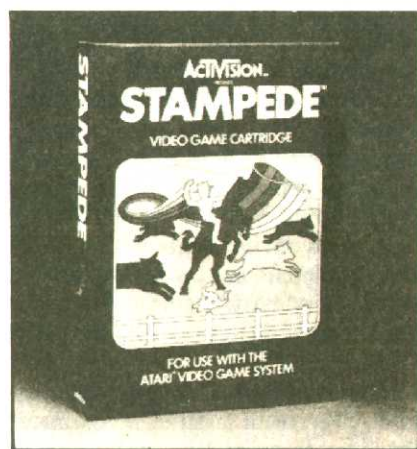
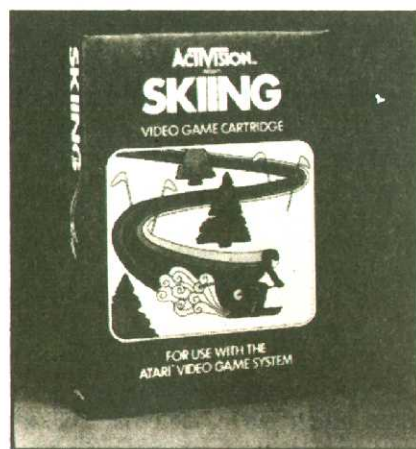
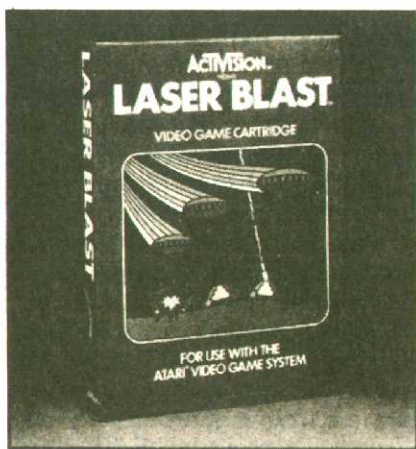
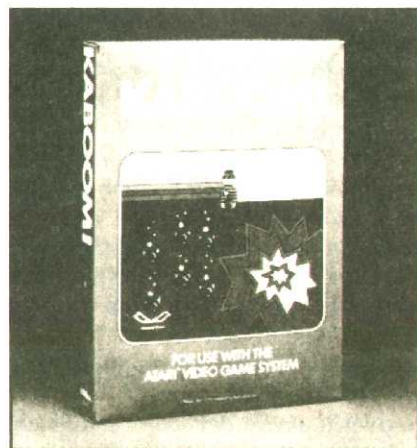
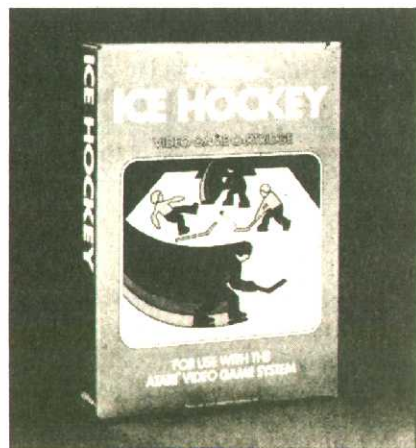
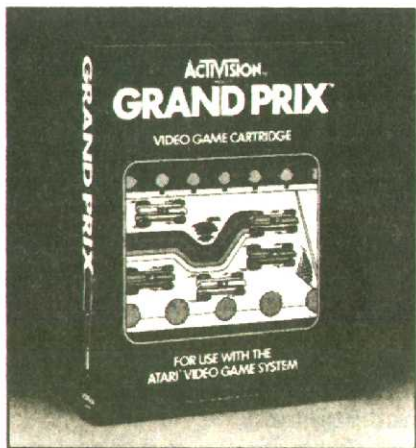
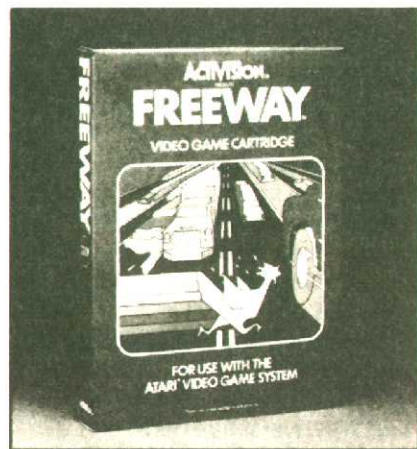
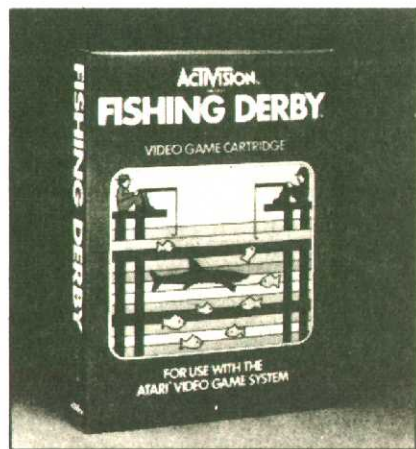
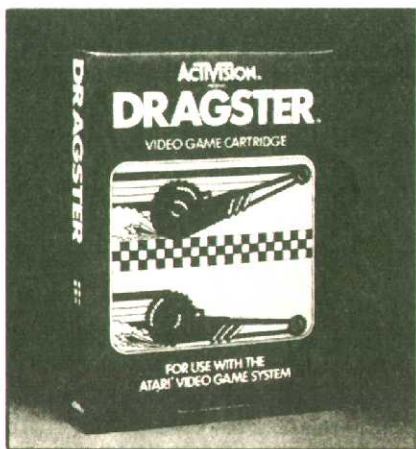
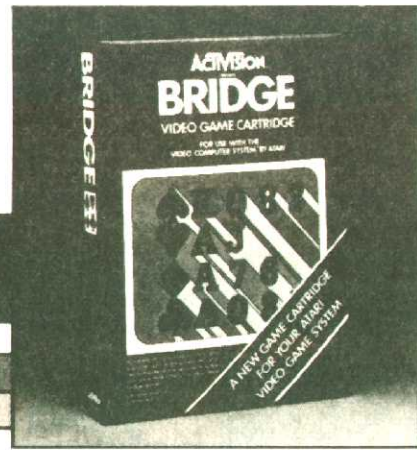
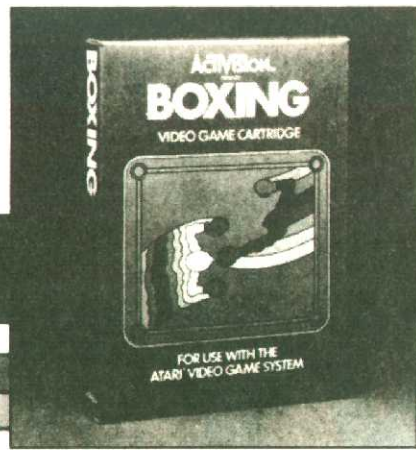
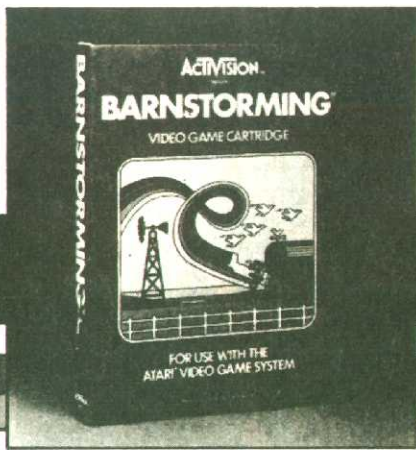
A: That always happens. But what appears, initially, to be difficult to make work, eventually comes around and does work. *Grand Prix*, which we released in March, was developed over a year ago. But David (Crane) put it on the shelf and came back to it. You can't say of any particular concept that we have not completed and released that it may not come back around, a solution found to whatever problems plague it during the design.

Q: Would you ever feel compelled to contrive and rush out a cartridge just because a genre happens to be hot at a given time?

A: We don't go for genres. To tell you the truth, we don't go for *anything* except ideas. When the ideas are fleshed out, they're either a great game or not a great game. As for genres, they always end up being defined after-the-fact anyway. There was no such thing as the 'cartoon game' before *Freeway* and *Kaboom!* came out. Then, all of a sudden there was this genre!

Q: Your creative people have wrung, from the Atari console, the kinds of detail and personality that other software manufacturers have rarely been able to equal. What's the secret?

A: If you talk to any artist, you'll be told that it's very difficult to separate inspiration from perspiration. Inspiration is obviously important; if you don't have a great concept, it doesn't go on to become a game. But to get from the inspiration to the final product is a very difficult, hard, grinding process for the individual designer. It can be grueling—six to eight weeks of fourteen hour days. There's plenty of interplay between our team of designers, but what I'm talking about is that process of realization which follows inspiration: the physical work, dedication, determination, and discipline to reproduce the vision in the videogame. That may *sound* trite, but application is the only way to achieve the kind of result



you described.

Q: Activision was the first company to recognize game designers by crediting them in the game package. What inspired you to do this?

A: A sense of justice. You would not think of starting a publishing company without putting the authors' names on the books they've written, nor would you think of putting out a recording by an artist without giving them proper credit. I wouldn't think of putting out a videogame, which is a piece of creative work—"an artistic" work which comes out of the blood, sweat, and talent of an individual—and not give that person appropriate credit. I think that's wrong.

Q: What you've said is reasonable, of course, yet for years this has *not* been standard practice in the industry. Why is that?

A: Other people don't see things the way we do. There's a distinct difference between the Activision point of view and the point of view of many people in this industry. Most other people see this as a business, whereas we see it as an art form with a business attached. The business is, in fact, constructed to package and distribute the art form from the artist to the recipient. That's all the business is, a pipeline.

Q: Are you breeding superstars? Will the talent behind these games begin demanding the kind of salaries which abound in sports and film?

A: These people *are* superstars, and they're very well rewarded. They sign autographs if they're walking through an arcade and get a *lot* of fan mail, eight to ten thousand letters a week between them. I don't think they're of the order of magnitude of the Personality Cult, the rock star or the athlete where beyond the work itself you have the charisma to become a star. People who perform in public tend to end up in that situation. That's not necessarily true of authors, nor is it true in the case of painters or sculptors or game designers.

Q: Are the designers and executives at videogame companies fiercely competitive behind-the-scenes, or do they privately acknowledge the good work that is done by someone else in the field?

A: There's still a lot of emotion in the business. It's very young and growing very rapidly; there are very hungry people who've come into it. I would like to see more rational dialogue among the business people because there are some common problems that we all face—particularly in matters of copyright and counterfeit. Also, I spent six years in the recording business. Though there's an enormous amount of rivalry between record people, there's also a great deal of mutual respect. I don't see any reason why that shouldn't exist here. We're not like the detergent industry, trying to distinguish one product from the other. A great piece of creative work is great no matter where it comes from; if one of our competitors does good work, I think you'll find us the first to compliment them.

Q: You mentioned the problem of copyrights. Do you have a reaction to the feud between *Pac-Man* and *K.C. Munchkin*? [Ed. note: See *Eye On* in the August 1982 issue for details.]

A: I've no particular reaction other than that there are legitimate issues here. The question of copyright in the videogame area needs a combination of both judicial and legislative attention. Part of what's going on in the

Pac-Man/K.C. Munchkin dispute is an attempt to define rules. Nobody's quite sure where the boundaries are. Is the concept of the maze game with little gremlins running around it protectable, or is it the final realization of its physical form as *Pac-Man* that is protectable? The answer, from a copyright standpoint, is that it's the final form. But if you get too close to that boundary between concept and final form, a judge is going to say, 'This is just a knock-off and all you did was change a few colors.'

Q: Do you feel that *K.C. Munchkin* is a ripoff of *Pac-Man*?

A: I'm not going to comment on the case myself. I've seen both games, of course, but I'm not a judge, and though I understand the law in principle I'm not going to try to prejudice the situation one way or the other.

Q: Do you consider Atari a 'bully' for trying to protect its territory?

A: You've got to keep in mind that Atari *built* this industry. Nolan Bushnell first and then the crew that followed have made it possible for us all to be where we are.

Everyone in the business is going through the adjustment from infant to robust adolescence. The cartridge industry has gone past a billion dollars, and it will never again be what it was like two or three years ago. Even Activision, which is less than three years old, had to go through the change from being a little company in 800 square feet of space to a company about to move into 85,000 square feet of office space with a 93,000 square foot manufacturing facility. For its part, Atari has had to accept that there is going to be competition in the industry. If there's discord, I suspect it's because things change so rapidly that sometimes people react emotionally to change before they really sit down and think about what the long-term impact of it is.

Q: Since the industry *is* booming, its characters and themes are much in demand. Would Activision ever consider licensing its creations the way *Pac-Man* has been put on everything from notebooks to a board game?

A: Only if they work. The whole *Pac-Man* thing has probably gotten a little bit out-of-hand. Next we'll see *Pac-Man* facial tissue or *Pac-Man* ice cube trays, and that doesn't make much sense. My attitude would be to judge each work on its merits. If a board game is good, it would be good whether you called it *Pac-Man* or not. All *Pac-Man* becomes is a marketing handle. You won't find Activision willy-nilly licensing our properties just to extract the last piece of change out of them.

Q: What are Activision's plans for the future? You've hinted about redoing existing cartridges and developing new ones for Intellivision in 1983; what happens beyond that?

A: We're in an industry that's only four or five years old. Many years of growth and change both in the technology and the creative uses of it lie ahead. Voice synthesis, voice recognition where you can talk to the game, 3-D—all sorts of things are being developed conceptually, but probably won't be realized to their fullest extent for years to come. Our creative team was not designed to crank out a new game every few months, but explore the fringes of the technology to see where we can go if we want to. As a creative organization dedicated to leading the software revolution, we'll be dabbling in everything. That's why there isn't any place I'd rather be than in this industry, in this company, with this group of people. □

**VIDEOGAMING
ILLUSTRATED
PROFILE****Don Imus**

by June Davis

By his own humble admission, he's "God's chosen, re-rosen disc jockey." By the admission of New York City's WNBC Radio, he's "the best disc jockey we ever fired." By his listeners' admission he's brilliant; they love his wildly unpredictable sense of humor and look forward to the shenanigans which spice up their early morning hours.

He's Don Imus, of "Imus in the Morning" (5:30 to 10:00 A.M. daily). He's a comedic genius in a medium where it's a daily challenge to be, and remain, a creative force. He can light up his broadcast with an improbable and slightly demented "fairy tale" about the Wizard of Ooze as told by "Crazy Bob". Or he might deliver a hard-hitting editorial from Geraldo Santana Banana warning listeners that turning to another radio station could be harmful to their health. Then again, he may continue his indefatigable effort to track down Idi Amin in order to make him climb the Empire State Building.

Don personally directs his on-the-air craftsmanship.

In early September of 1979, Imus brought his lively brand of good naturedly vicious fun back to the WNBC perch which he had held for six years before his now-famous 1977 firing for on-air vulgarity — not to mention chronic tardiness and absenteeism.

A native of Riverside, CA, and a graduate of Arizona State University, Imus came to New York in 1971 for his first stint on WNBC — quite an accomplishment for a radio personality with not quite three years experience.

Since that time, he has not only become the Big Apple's number one disc jockey, but a noted nightclub comedian and author of *God's Other Son: The Life And Times of the Reverend Billy Sol Hargus*, based on the exploits of Imus' shyster preacher, who is another frequent visitor on his program.

If Imus is the voice of insanity, Charles McCord, his partner and station newsman, is the voice of reason. He tempers Imus' outlandish views every half hour during the newscasts. He is the velvet glove to Imus' steel fist.

Together, they make for an unusual interview. Every once in a while, McCord can get down and get serious, but Imus' bag is heavy sarcasm.





VGI: On a recent show, you and Mr. McCord decided that the world would be a better place without videogames. What's the problem here?

IMUS: They invented these things that you play on television so that when there's nothing on you can ...! Oh, God, it's just insanity. And they cause cancer, by the way. They do.

McCord: In laboratory rats.

IMUS: Rats who play *Pac-Man* get cancer!

VGI: Did you know that *Pac-Man* is one of the few games that appeals to women?

IMUS: That's because it's a sick deal. It's an eating thing, you know. A lot of women are *perverts*.

McCord: There must be something deeply Freudian about that.

VGI: What games have you played?

IMUS: I've never played one. I never intend to play one.

McCord: And I resisted. It's only because I have a seven year old at home that I was forced to give in. He got all his little friends together and they were planning to beat me up ... sort of a Lilliputian affair.

VGI: So you have played home video then?

McCord: I have. The one area I find especially interesting is the chess program.

IMUS: Why don't you just play real chess?

McCord: Because you play against the computer. It's kind of fun. There are eight different skill levels. I run it right up to 8 and get a halfway decent game out of it.

IMUS: You know, McCord, you're nuts.

VGI: Is chess it for you, then?

McCord: No, my son had to have some others which I understand are versions of arcade games. I find them mindless and infantile. I don't think they benefit a kid one bit. The most detrimental thing about them is that they keep kids from other pursuits which could be much more beneficial, i.e. reading or doing something creative.

VGI: Aren't *some* videogames creative ... inspirational to the imagination?

McCord: These games require no creativity at all. They simply test the quickness of motor responses and nothing else.

They develop the skill of playing videogames. Well, take that to Chemical Bank and see what you get.

IMUS: Tell the world that I want no one who plays videogames to listen to "Imus in the Morning," by the way. I'm serious.

VGI: That should cut the audience down substantially. What you're saying seems part of the paranoia running rampant: television and movie people feel videogames are cutting into their patrons, and surveys indicate that these games entice listeners from radio —

IMUS: I don't care. I don't want them to listen anyway. They can go play their games. We're doing all the funny stuff and they're playing their stupid little games with people eating each other ... Besides, it's hard to play a videogame on the way to work.

VGI: Really, don't you think there's a possibility that videogames are shrinking radio audience?

IMUS: No. God, are you crazy? You've lost your mind.

VGI: How about this then — do you foresee a way to integrate rock music with videogame mania?

McCord: Why not? Pipe in anything. Pipe in Brahms.

IMUS: Or a little *Eagle*.

McCord: Sure. These kids don't have to pay attention to anything anyway. You can't hear anything anyway, except the jingle and jangle of the various video machines. I mean, is that music? The game with the flattened frog, *Frogger*, has an amusing but repetitious tune. Eventually, it gets kind of irritating because every time a kid resets a game, the damned tune is repeated.

IMUS: Many of these games are based on violence like shooting and dumb stuff like that. There's one where the kids have a steering wheel and they see how many cars they can pass.

McCord: That frog game where it crosses the road against oncoming trucks and automobiles shows the frog getting mashed. It makes a horrible sound. It goes squish and spreads out, real gooey ... That's the only one I really like.

IMUS: Yeah. I *like* that.

McCord: I'm heavily into violence and killing little animals.

IMUS: Can you see the frog's guts on the screen?

McCord: Darn near! He goes out on all four legs and is flattened.

IMUS: How sick is that?

VGI: The bottom line is, like it or not, videogames are a part of life. What would make you happy? A videogame with Billy Sol Hargus as the theme?

IMUS: Uh — how much bread are we talking about up front here?

VGI: So you *would* let your characters become videogame themes?

McCord: Of course, overnight!

IMUS: Now we're talking here.

McCord: I've always said that these games have a lot of promise and that they challenge you intellectually.

IMUS: Well now, I think so too. Yessir, we'd be *very* interested in contacting a video company to explore this possibility.

VGI: Since every game needs an object — like *Frogger* where the object is *not* to get run over — what do you think the object of a Rev. Billy Sol Hargus game would be?

IMUS: Searching for a handbasket and then going to hell.

McCord: Or drowning.

IMUS: Then you'd lose the handbasket motif.

VGI: In spite of your feelings about videogames, would you admit that they are an art-form?

IMUS: Sure, like Norman Mailer produces art.

VGI: At least the videogames expose people to the capabilities of a computer. How about the advantages there?

McCord: Just punching a button is not really exposure to computer technology. Unless, of course, these games have a keyboard and the capacity for setting up and solving problems. I think it's still a pretty big leap from videogames to computers.

VGI: But some sort of computer is almost standard equipment in many schools now. Isn't it possible that kids get so turned on by the games that they yearn to learn what makes them tick so they can design them themselves?

McCord: I suppose that's valid.

IMUS: That's a load.

McCord: Certainly we're experiencing an explosion of computer and microchip technology that has progressed so quickly that we're a little bit intimidated by it. It's mystifying to us, but not to the kids. To them it's a part of the everyday world. They really helped spawn this interest which created a market for the home computer.

VGI: Finally; a good word about videogames.

IMUS: It didn't come from me.

McCord: Maybe why we're angry about these things is because there's no possibility of our ever understanding them unless we're under the age of ten!

VGI: Speaking of anger, many parents also complain about videogames' expense.

McCord: Yes? Dumping those damn quarters into those things really adds up ... unless you have one of those home deals. But of course, you dump a lot of money into that too.

VGI: There is even a positive side to that. The videogame industry has been a boon to the economy. New businesses and career opportunities have opened up and flourished.

IMUS: The fact that they make money doesn't make them all right. You can make money selling drugs too, you know. These machines are doping up kids, even if you can't put computers up your nose.

VGI: For less physical types, videogames are a way to succeed that doesn't require a football field, a baseball diamond, or a basketball court. Isn't that important?

IMUS: You mean kids who don't want to be real men? Is that what you're saying? Kids who want to be *fruitballs*? Is that what we're talking about here? Are all people who play videogames *homosexuals*?

VGI: No. It gives people who are not jocks a place to go and succeed through strategy, skill, and determination — no matter how strong they are.

IMUS: How about the library? Can't they go to the library?

McCord: That's right. If you really want to be successful, crack a book.

VGI: Would you feel better about videogames if they concentrated more on historical or classical themes?

McCord: Same deal. That's just a retailoring of the machine with no real improvement. You know what I would like to see? I would like to see them all short-out simultaneously. Around the world.

IMUS: That's the reason I want another blackout.

VGI: Since these machines are a problem for you, would you be adverse to doing a commercial on the air for them?

IMUS: Oh, no. Of course not. NBC pays the freight here. It's not my radio station, it's theirs. They hired me to read the commercials. And I'll read them. It costs so much to get on this radio station ... particularly on this program ... well, I can't think of any sleazy products that we advertise.

McCord: Of course, he has no scruples anyway, so it wouldn't make any difference if the product were sleazy or not.

VGI: If someone with scruples and creativity were to create a Rev. Billy Sol Hargus game, would that help propel the videogame industry toward more worthwhile content?

IMUS: Yeah, but you might get some heat from the Moral Majority about Hargus walking on water and all that.

VGI: What about the educational possibilities of videogames? Do you see any application of them as a teaching tool?

IMUS: Sure. There are infinite possibilities. I just thought of an educational game. We call it "Single's Bar." The idea is to *score!*

VGI: And you think *that's* an improvement?

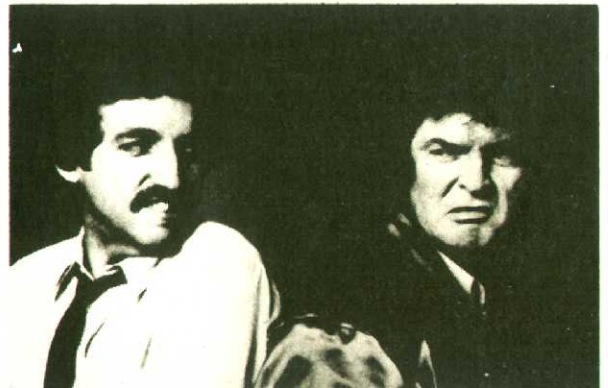
IMUS: Yeah, it gives the grownups something to do.

VGI: Seriously, any closing thoughts?

IMUS: All right, okay, I *like* them. I just don't intend to *play* them, that's all. All right?

VGI: Fair enough.

IMUS: Well, it's been fun, but we've given you much more time than you deserve. □



supergaming

Presenting: The First Annual Vista Awards!

Videogaming Illustrated picks the best cartridges on the market.

It's been three months since you were given a home videogame system for the holidays, and you're scouting around for new cartridges, new challenges.

Or perhaps you're going to splurge and pick up those games you've wanted for years.

Maybe you're wondering if you shouldn't add one or two of those *other* systems to your hardware collection.

Whatever your reason for heading to the local video store, there are certain games which shine above the rest, cartridges which boast extraordinary play, graphics, or other virtues.

The staff of this magazine has been playing videogames for years and, unlike many consumers, we also have the advantage of testing every new game which hits the market. You've read our reviews in "Preview," but that's only half the story, the recent products. Some of them are indeed brilliant, but we felt our readers should have the benefit of our expertise in recommending the top-of-the-line videogames, old as well as new, so that they could get the most out of their home unit.

Here, then, are the first annual *VISTAs* — the *Videogaming Illustrated* Software Thrall Awards.

The best videogames money can buy.

First, however, a few words on the categories and how the winners and

runners-up were selected.

We created categories which would satisfy every taste. Graphics are more important to some players than game-play so, for each of the major systems, we singled-out games whose visuals are extra-special.

We also picked a "Best Game" overall, selected from the winners in each category. It's true that certain games had an advantage, being compatible with systems boasting more sophisticated memory. However, we don't qualify the statement that Abraham Lincoln was a better President than Warren Harding simply because of circumstance: it's the bottom line that counts.

At the risk of striking a note reminiscent of these boring perorations delivered at the Academy Awards, we're obliged to let you in on how these selections were made.

To begin with, we limited our selections to the four major systems: Atari 2600 and 5200, Intellivision, ColecoVision, and Odyssey. With Channel F and Astrocade struggling from limbo, and Vectrex just getting started, we felt it was pointless to pit them against the giants.

In terms of establishing categories, the twenty-seven of our staff and freelance writers, editors, and consultants directly associated with home videogames were asked to submit suggested divisions, which they did. These were then discussed in a round-

table session from which the final list was hammered.

Categories such as ColecoVision sports were not incorporated because, obviously, with two games in the marketplace it would hardly have been a contest.

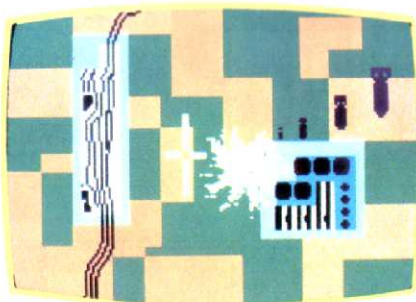
Each of the videogamers was next required to suggest three games for each category. Discontinued games were not allowed in the balloting. The games most frequently mentioned were then given to all the panel members, who were asked to pick the one best in each category — and explain why they voted the way they did.

The winner won the Vista and the runner-up won — well, second place carries with it the not-to-be-snickered-at distinction of being a damn fine videogame.

For the record, of thirty winners, the companies scored as follows: Atari, 6; Coleco, 5; Intellivision, 4; Activision, 4; Imagic, 4; Odyssey, 4; Parker Brothers, 1; Vidtec, 1; M Network, 1.

Absent from the final results, though not from the balloting, were all the games produced by these companies as well as Telesys, Apollo, SpectraVision, CBS Videogames, 20th Century Fox Games of the Century, Tigervision, VentureVision, Mystique, and Wizard Videogames.

As these companies release more games, they are sure to have better luck next time.



Supergaming

BEST 2600 GAME

Though *Space Invaders* made a strong showing for Atari, Activision walked off with the two top spots here.

The company's late-1982 slide-and-shoot *Megamania* was voted the best game for the Atari console/ColecoVision expansion module. Its most commonly cited strengths were the various designs and patterns of the falling objects, excellent sound effects — especially the sizzling destruction of the gun — and the ratio of points-earned to fuel consumed operating the gun. Surprisingly, when the game first came out, several staffers complained that the falling bow ties, dice, et al didn't really resemble those items; today, those same critics say that gameplay is so strong the graphics don't matter to them.

Activision's *Pitfall* took second place — although, interestingly, it came in fourth on the Intellivision-compatible voting. The game scored heavily because of its novelty, challenge, and the two-pronged (underground/overground) approach to Harry's quest for treasure. Once again, gameplay is obviously impressive enough to have buried some early mutterings among our writers that the animation and backgrounds were merely average.

Imagic's *Demon Attack* took third place.

Voting in the category of the most popular unit of all-time was surprisingly dominated by videogames which have been released over the past few months.

Voters were advised to be objective, forget that they've been playing *Warlords* and *Kaboom!* for years, to try and recall those first impressions of play.

However, familiarity seemed to breed, if not contempt, then perilously low votes for most standbys.

BEST INTELLIVISION GAME

There are four manufacturers making games for this console: Imagic, Coleco, Activision and, of course, Intellivision. Despite the competition, Intellivision won first place with its IntelliVoice masterpiece *B-17 Bomber*.

Yet, less than half the voters singled out the voice capacity in explaining their selection. Most agreed that the game won because of its unparalleled four-level play (a map of Europe to select sites, the detailed instrument panel, views from the pilot's chair as well as from three, six, nine, and twelve o'clock where the player must shoot down wonderfully sketched aircraft, and a chilling look through the bombay doors as you target and release your bombs).

In the audio-department, more voters applauded the very realistic roar of the engine and bullet sounds than the voice.

Imagic's *Demon Attack* came in very close to *B-17 Bomber*, graphics and gameplay winning it the runner-up spot. More than one voter said that it was the exciting last level featuring Pandemonium which really won them over.

BEST ODYSSEY GAME

Demon Attack was voted an extremely close third — one vote away from a tie — in this category. The game will not be available until May and, while our staff was widely impressed with the prototype, they wanted to see the final product before casting an important vote.

Thus, *Odyssey* won first and second place for its own console. The commercially successful *UFO* won handily over all other competitors, taking more than half the votes. Singled-out for praise were the options to ram or fire enemy vessels with your UFO, and the challenge of always attacking from the bottom so that debris from the exploding ships flew upward and took out other vessels. The graphics of

the UFO short-circuiting were also lauded.

The late, lamented *K.C. Munchkin* took a few protest votes despite our ban on discontinued games, but the ambitious gobbler was represented in second-place by *K.C.'s Krazy Chase*. Indeed, had *K.C. Munchkin* not diluted the total of its heir, *Demon Attack* might not have placed such a close third.

Though many of our staffers had originally criticized *K.C.'s Krazy Chase* as being a tad on the juvenile side, gameplay and the demanding strategy of just *when* to nibble those segments for optimum benefit won the hearts of videogamers ... No one seems to feel that the new, talking version has added much luster to gameplay.

Much to our surprise, the Master Strategy board-and-cartridge series made only a token showing in this category (see BEST EDUCATIONAL GAME, below, for the other guest appearance), and that in the person of *Quest for the Rings*. The fact that most of our judges are hard-core videogamers as opposed to boardgamers may have had something to do with that.

By the way, each ballot contained a place for additional comments. Several of our voters utilized this space to remark that if *Odyssey* had relied more on the keyboard and less on the joysticks, some of the company's games would have had more variety and a higher level of enthusiasm among voters.

This is borne out by the fact that in this category, only eight of the fifty-odd *Odyssey* cartridges now on the market were even mentioned, a relatively low number. (They are, for the record, the first, second, and third place winners, the one defunct game, the Master Strategy game, *Blockout/Breakdown*, *Pick Axe Pete*, and *Monkeyshines*. Surprisingly, not one game created for the Voice was among the chosen few.)

Continued on page 33

Supergaming

There isn't a videogame console on the market whose joysticks can't stand some improvement.

For example:

*The Intellivision disc is difficult to manipulate. The additional directional functions be dashed, it's tough to make movements which aren't left and right.

*The ColecoVision handle is too short. You can't get a tight-fisted grip on it, and for players who really get into their games, this is a drawback.

*Astrocade's on its last legs, but some enthusiasts claim it was never in the running: after a few months of play, the joystick/knob combination tends to get stuck.

*The Atari joystick is great — if you're right-handed. Lefties are consigned to sucking pond water.

*Odyssey's unit is okay, but the handle is just too delicate: you can't really get cooking if you're afraid of breaking the stick.

With the explosion of videogame software has come an increase in the amount of hardware which is also available. In previous issues, we showed you the liquid mercury joystick which you operate with one hand (that one doesn't seem to have caught on; too pricey and there's a fractional delay in its response time), and the Zircon joystick-knob unit which is a sturdier version of Astrocade's grip.

Now, however, there is much more to choose from, some of the equipment remedying the problems enunciated above — and some you didn't even know you had until the products were made available!

The most serious complaint lodged against the home units is that they aren't as sturdy or as responsive as their arcade counterparts.

That's true. The cost of the arcade controls is considerably higher than home joysticks, and the technology packed into the cabinet is more sophisticated than Atari et al can cram into your little home console.

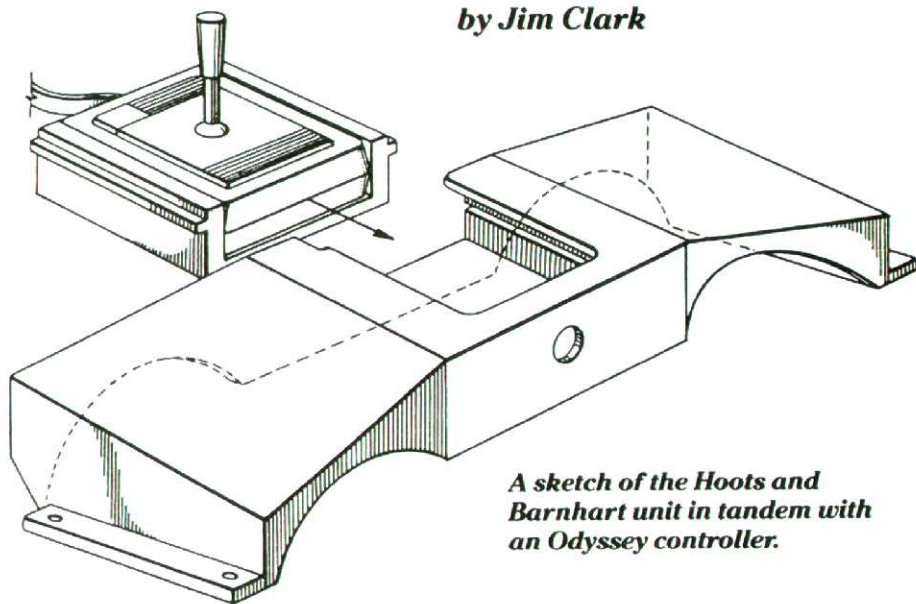
However, DZyne Video Products (64 Dayton Road, Waterford, CT, 06385) has produced a sturdy joystick which is as close to an arcade control as the market has ever seen.

The Supr-Stick is compatible with the

The Joystick REVOLUTION

Buttons and arcade-quality controls invade home videogaming

by Jim Clark



A sketch of the Hoots and Barnhart unit in tandem with an Odyssey controller.

Atari VCS, as well as with the 400,800, Commodore VIC 20, and similar units. Actual arcade components are used in its construction, requiring comparatively light pressure and responding with greater speed than any stick currently available.



Supr-Stick

The action button is likewise heavy-duty and located where it's most convenient: behind the stick, making it equally accessible to right-handed and

left-handed players.

The Supr-Stick retails for \$39.95, and is something no serious videogamer should be without.

DZyne also manufactures two other useful products, a pair of extension cords with which to connect any nine-pin joystick to the videogame console.

These cords come in handy with two of those items-you-never-knew-you-needed: a Videogame Controller Holder and the Grand Stand.

Both items are "stands" for videogame controls, though the former is the less ostentatious of the two.

The Videogame Controller Holder is the handiwork of Greg Hoots and Chris Barnhart of PO Box 1401, Topeka, KS, 66601. Right now, you have to custom-order one, in wood, for "under \$50." By early next year, the inventors expect to be producing them in plastic for less

than \$30, and in do-it-yourself kits.

The Holder is an odd-looking contraption, but functional: you slide your joystick unit into the Holder, then slip the latter onto your lap. There are two concave excavations in which you slip your legs.

According to Hoots, "It allows use of the index finger to operate the action button and also relieves the stress associated with holding and squeezing the hand held controller."

The only problem they have is with the short-stiff cord of Intellivision. "You've got to sit close to it," Hoots concedes. However, for it and for ColecoVision, where the action buttons are on the side, there are arcade-style fire buttons built right into the lapstand to enhance the arcade simulation.

Suncom also makes Starfighter and Slik Stik, a pair of high performance joysticks. While they respond fractionally better than Atari joysticks, they are lightweights in terms of simulating arcade realism. The advantage of Starfighter over its competitors, however, is that its internal mechanisms are made out of case-hardened stainless steel rather than plastic, which makes it more durable.

They are also better buys than other joysticks, at \$16.95 and \$9.95, respectively.

(Actually, the players who tested both for us preferred the cheaper Slik Stik over its more expensive counterpart. Slik Stik has been a knob on the top of the handle which gives you a better grip on the unit.)

Slightly more handsome and a tad more innovative is PointMaster, a new joystick from HWH Enterprises of 16 East 52nd Street, NY, NY 10022.

"The joysticks I have used personally all had limitations as far as design and features are concerned," says inventor Bruce Maier, "Instead of typically having the firing button separate from the joystick control, PointMaster provides a convenient thumb trigger at the top of the joystick handle."

Though other units such as Video Command and Le Stick (covered in issues #1 and #2, respectively) have had the action button on top, the former was too large and slow-to-respond, and the



The PointMaster, one of the trimmer units you can buy. The handle offers excellent grip, abetted by high-tech design.

latter was atop the otherwise-clunky liquid mercury unit. PointMaster is the first joystick to combine the traditional Atari-type unit with the on-top action button.

Players are equally divided as to its utility: some find it disorienting, interfering with play, other convenient for thumb-on-top, one-handed action.

Decide for yourself at \$16.95 (two for \$31.90).

No company in the field has more unusual and *considerate* joysticks than KY Enterprises (195 Claremont Ave., Suite 288, Long Beach, CA, 90803).

KY produces a FingerTip Controller, which we'll get to in a moment. First, a word about their controls for the disabled.

We hope they make a fortune on these. Providing videogame access to people who have limited or no use of their limbs is both noteworthy and humanitarian.

KY's units range from a mouth-operated controller at \$55 to a \$150 multigame board which eliminates the need to handle a cartridge each time a different game is desired. There is also a hand-wrist controller for people with

spastic movement of hands or for operation using the feet. KY even has a unit where movement of the on-screen objects are governed by the head, the action button run by a "puff switch."

Less specialized is KY's FingerTip Controller. This is a box with five buttons: one is the action button, the other four are directional controls. The buttons work just like they do on arcade games like *Phoenix*.

If you're used to a joystick, this will take some getting used to. It also requires a bit more coordination. However, once you get the hang of it you can change directions much more rapidly than with a joystick. KY offers a left-handed version as well as one for righties.

The FingerTip Controller sells for \$19.95, the kit for \$14.95.

In terms of improving your joystick game, these are the most unique and/or satisfying products on the market. However, this is just the beginning of the joystick invasion, one which will continue until our games come equipped with voice recognition.



KY's FingerTip Controller, the most compact push button unit available.

You may feel a little silly standing behind the Grand Stand (The Grand Stand Co., 4231 Bluebell Ave., Studio City, CA 91607), sort of like Lincoln waiting for Stephen Douglas to show up: the thing looks like a lectern and, in that context, elevates gameplay to Biblical importance.

At the same time, the unit feels like a kid's scooter: you put your feet on the



The Grand Stand, shown here with a push button controller.

base and lean it toward you when you sit down. The joystick screws neatly into the top of the unit.

Functional? It *does* make your controller feel more solid, and in conjunction with the Supr Stick is about as close to an arcade controller as you'll get in the home.

The Grand Stand is manufactured from solid wood with a fine walnut finish. If you want a conversation-piece hunk of furniture, this is for you.

The Grand Stand sells for \$34.95.

Perhaps the most useful product of all, in terms of improving joystick performance, is the Skil-Stik from C & T Creations (127 Weybosset St., Providence, RI, 02903).

This is an easy-to-attach joystick handle for your Intellivision/Tandyvision keypad. There is no need to take the hand control unit apart: you just peel off the bottom of the double-sided tape at the base of the Skil-Stik and press onto the disc, allowing for swifter and more accurate response. It may *look* like a marker from *Candy Land*, but it's an inexpensive (\$5.99 for a package of two) jewel.

For forty-two years, a company by the name of Wico has been the largest designer of control devices for arcade games.

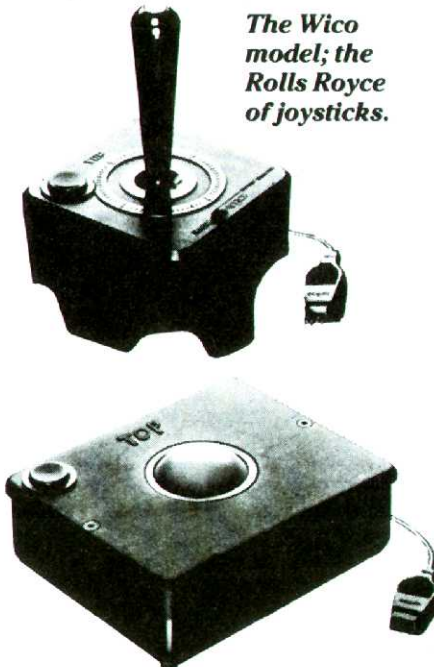
Now, the Wico technology is available in the home, for your Atari VCS,

and two of their units are of particular importance to home videogamers.

Their Command Control joystick is a joy — a wonderfully responsive and durable unit. It's a sleeker unit than the SupR Stick, and gameplay is virtually identical. Some players prefer the "weight" of the latter, since SupR Stick *feels* more like the panel of an arcade game; other videogamers may prefer the lighter Wico unit. In either case, the \$29.95 pricetag of the Command Control joystick can't be beat. This is one of the two joysticks you must own.

Slightly more expensive, but worth every penny, is Wico's Track Ball. This is the first such unit available for the home and it, too, is a delight. The ivory ball sits in the center of a black and red casing, the action button on the top left.

It's as freeflowing as its arcade counterpart and, despite a \$69.95 pricetag — a bargain if you consider play value — the Track Ball is something no serious videogamer can be without.



The Wico model; the Rolls Royce of joysticks.

Wico strikes pay dirt again with its Trackball.

Suncom Inc., at 270 Holbrook Drive, Wheeling, IL, 60090, has taken some of the chauvinism out of videogaming with Lefty, an adaptor which turns "normal" joysticks into left-handed joysticks. In short, you turn the joystick so that the action button is in the right-hand corner instead of the left. Interfacing Lefty rearranges the directional signals so that the correct on-screen movement is achieved.

Arcadia Joysticks

All these manufacturers seem eager to recreate the playing ease and comfort of the myriad arcade controls. The Atari stick is just a stiff stand-in for the trackball of *Missile Command*, the buttons of *Astroids* and *Space Duel*, and the red ball topped stick of *Dig Dug* and *Kangaroo*.

Bally/Midway has these button-type controls and more. *Gorf* set the standard for pistol grip controls, giving the player a greater feel for the cataclysmic space conflict. Their new *Solar Fox* started its arcade life with a simple red ball stick, but benefitted from a pistol grip refitting. Now players can use both the handle's trigger or an optional fire button.

Sega/Gremlin has a pistol grip on their revolutionary *Zaxxon*, but this company is also a great proponent of the steering wheel control. On both its sitdown and upright versions of *Monaco G.P.*, there's a thick padded wheel as well as a solid stick shift. It looks like ColecoVision will be the first to offer this option to modern homevideogame players when it releases its version of Sega/Gremlin's popular *Turbo* race.

The double red ball sticks make for some frenetic playing at the hands of Stern's *Tutankham*, Taito's *Space Dungeon*, and, especially, Williams' *Robotron 2084*. But a control stick of truly another dimension is Bally/Midway's *Tron*.

It has a special device which looks and feels like a comfortably winning combination of the pistol grip and regular stick control. Adding to the game playing pleasure is a dial — a fixture arcade players might remember from the likes of Taito's *Wild Western*. Sega/Gremlin's new *Zektor* game also gives new life to the helpful dial control.

But no overview of arcade controls could be complete without the fond memories of the scope and target games. Instead of mere buttons, sticks, balls and dials, these machines had entire weapons or periscopes attached. There was a real hands-on feeling when blasting targets or sinking sea-going vessels with both arms wrapped around these impressive controls.

Ahoy!

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Presenting: The First Annual Vista Awards!

Part Two of the first annual Videogaming Illustrated
"Vista" Awards

Last issue we published the opening installment of our "Vista" Presentation — the Videogaming Illustrated Software Thrill Awards. In case you missed it, the staff and writers of this magazine were asked to vote for the best games on the market in various categories.

The winners were as follows:

BEST 2600 GAME

Winner: *Megamania*
First Runner-up: *Pitfall*
Second Runner-up: *Demon Attack*

BEST INTELLIVISION GAME

Winner: *B-17 Bomber*
First Runner-up: *Demon Attack*
Second Runner-up: *Las Vegas Poker and Blackjack*

BEST ODYSSEY GAME

Winner: *UFO*
First Runner-up: *K.C.'s Crazy Chase*
Second Runner-up: *Demon Attack*

BEST 5200 GAME

Winner: *Centipede*
First Runner-up: *Pac-Man*
Second Runner-up: *Defender*

BEST GAME BASED ON NON-ARCADE MEDIUM

Winner: *The Empire Strikes Back*
First Runner-up: *Superman*
Second Runner-up: tie between *Fantastic Voyage*, *Tron: Deadly Discs*, and *Journey/Escape*.

BEST COLECOVISION GAME

Winner: *Venture*
First Runner-up: *Ladybug*
Second Runner-up: *Zaxxon*

BEST ARCADE ADAPTATION

Winner: *Pac-Man (5200)*
First Runner-up: *Zaxxon*
Second Runner-up: *Centipede (5200)*

BEST EDUCATIONAL GAME

Winner: *Sid the Spellbinder*
First Runner-up: *Word Zapper*
Second Runner-up: *Nimble Numbers Ned*

BEST 2600 SPORTS

Winner: tie between *Super Challenge* and *RealSports Baseball*
First Runner-up: *Boxing*
Second Runner-up: *Video Olympics*

BEST INTELLIVISION SPORTS

Winner: *NFL Football*
First Runner-up: *Horse Racing*
Second Runner-up: *Boxing*

Here, now, is the second group of winners in the Vista competition. (Please note: there were no awards for ColecoVision and 5200 sports. At present, the categories are too sparsely populated to make balloting worthwhile.)

BEST ODYSSEY SPORTS

Sports cartridges are not a strength of the Odyssey system, and the games

listed below were frequently cited as having won by default.

The only racing game which made the winner's circle in any category was the first place award for *Speedway/Spinout*. However, most voters took pains to note that this was *not* due to the extraordinary gameplay of this cartridge, but the dearth of candidates in the Odyssey catalog.

The two games are on the same cartridge, and *Spinout* was inarguably the favorite. In it, players must race one another around a tortuous course. In *Speedway*, the player simply passes other cars.

Baseball took second place and *Alpine Skiing* third. Interestingly, only *Computer Golf* took any other votes: *Bowling*, *Volleyball*, *Football*, *Electronic Table Soccer*, et al, won nary a nod.

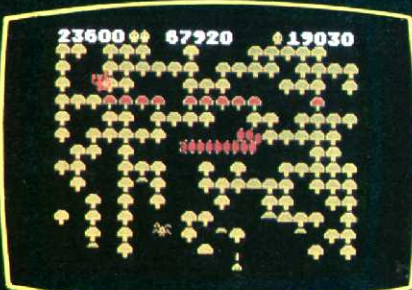
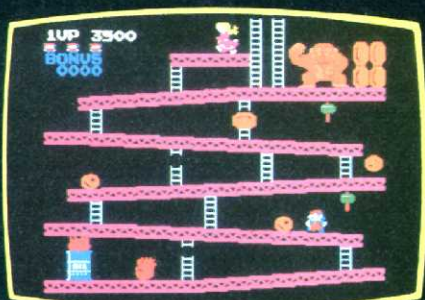
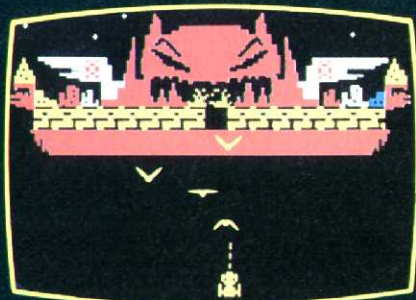
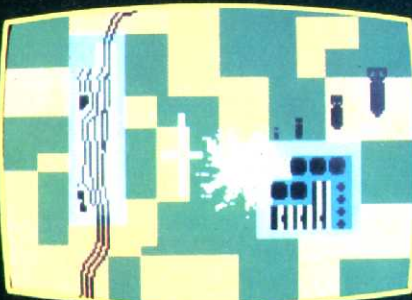
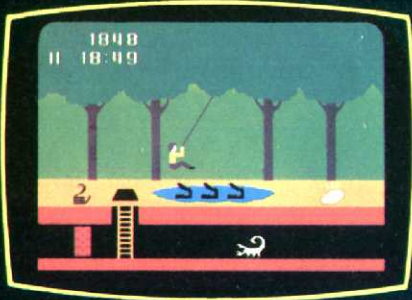
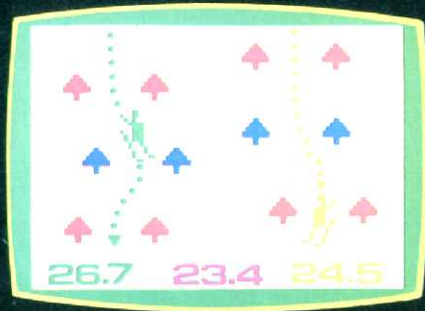
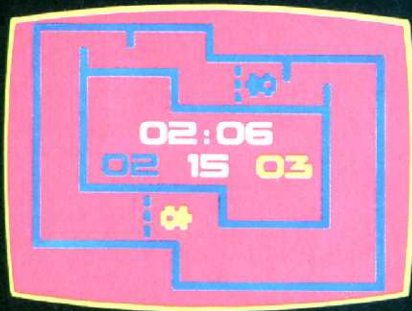
BEST 2600 GRAPHICS

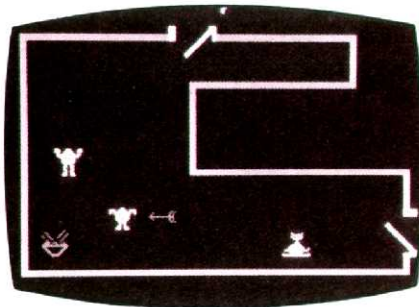
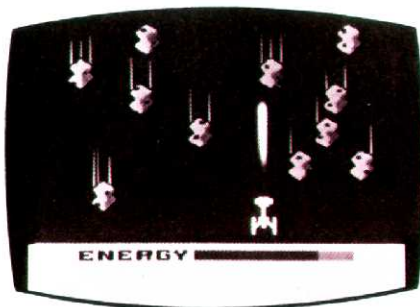
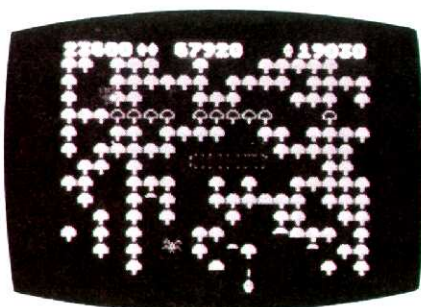
Each of the voters was tutored prior to balloting that this and *all* the graphics categories should not be judged in terms of the most *dazzling* pictures. Rather, the electorate was to select the games whose graphics were most ideally suited to gameplay.

Obviously, it would not be fair to judge a relatively detailed screen like *Dragster* by the same standards as the cluttered but simple course of *Pac-Man*.

This was a close one where first and second place were concerned.

Pitfall edged out *Phoenix* for the top spot, the animation and atmosphere of the former squeaking past the animation and arcade fidelity of the latter.





Left to right: *Centipede* won its Award for its fidelity to the arcade game as well as on its own merits. Best 2600 game went to *Megamania* for its frantic but fun gameplay. *Venture* was the winner in the best ColecoVision game category.

The fact that *Pitfall* packed so much color and so many characters and props into the cartridge was the deciding factor.

Third place belonged to *Grand Prix* for its color and animation. Surprisingly, Imagic's popular *Demon Attack* was not among the top contenders, apparently booted out of the running by the newer *Phoenix*.

Among all the runners-up, most were Activision games.

BEST INTELLIVISION GRAPHICS

B-17 Bomber won again, its multiple screens and extremely evocative scenes of flight and combat being noted over and over for the win. Many voters were particularly impressed with the animation and realism of flaming enemy fighters tumbling earthward.

Imagic's *Demon Attack* followed it once again, the graphics on the Pandemonium level and planetary vistas, not to mention the dodging and flitting demons, earning heavy praise.

Third place went to a dark horse: *PBA Bowling*. Though this game placed fifth in the category of BEST INTELLIVISION SPORTS, its ingenious two-screen approach took the prize here. Particularly impressive are the animation of the bowler — seen from the side in the first screen — and the slow motion of the ball striking the pins, seen head-on in the second screen.

Star Strike, Intellivision's highly-touted space combat game, placed a close fourth.

BEST COLECOVISION GRAPHICS

Zaxxon walked away with this award, although a number of disgruntled members of the staff complained that gameplay had obscured objectivity. They claimed that the animation and atmosphere of the second place

winner, *Smurfs*, was infinitely better.

Regardless, *Zaxxon* was the overwhelming favorite, lauded for its crisp resolution, three-dimensional effects, fluid motion, and multiple screens. And as much as its lack of high drama may have hurt *Smurfs*, the game did place a strong second for the above-mentioned reasons. Though few people are likely to agree with one enthusiast who noted on her ballot, "Now we don't need a Hobbit game; *Smurfs* is a great evocation of an elfin world," it is not without considerable graphic charm.

Donkey Kong landed the Bronze, though several voters said it would have placed higher had Coleco put more than just three screens in the game and not altered the elements in the second. However, dissociating it from the arcade game, voters gave it a clear third place victory.

BEST 5200 GRAPHICS

Because most of the initial releases for this unit were arcade adaptations, voters tended to favor those which most faithfully reproduced their coin-operated counterparts.

Centipede was the easy winner in this category, and it was the only 5200 game which managed to impress the judges on its own merits. That is, fidelity to the arcade game notwithstanding, they were impressed with the twining, bobbing, high-speed movements of the centipede, not to mention the piecemeal blasting of the mushrooms and the slithering movements of the rest of the *Centipede* dramatic personae.

Many voters were also impressed by the way the characters and set pieces changed colors at different scoring plateaus.

Pac-Man took the number two spot, despite frequent complaints that it was *still* an inferior game played with greater breadth than height. Nonetheless, the characters of the ghosts and

gobbler are perfectly rendered, the nuances of Pac-Man's chomping are also present, and the graphics were judged the best that they could possibly be given the different proportions of a home TV and an arcade screen.

Third place was a close win by *Defender*. Though *Defender* buffs expressed some disappointment with explosions, scenery, and gunfire which was less spectacular than the coin-operated version, enough were sufficiently impressed to hand it a narrow win over *Galaxian*.

BEST GAME

Before voting began, everyone on the staff expected the top spots in this category to be a slugfest between ColecoVision and the Atari 5200.

They weren't wrong.

However, there was one very surprising showing for the 2600 hardware.

Centipede was the winner here, hoisted into the top spot by graphics, gameplay, and interest level. Yet, placing a solid second was Activision's 2600 cartridge *Megamania*. It was selected for its unforgiving gameplay and innovative approach to the old slide-and-shoot theme.

Third place went to Coleco's *Venture*, gameplay, pace, and its individualistic musical score being singled out, with *Ladybug* placing fourth.

Fifth place went to the 5200 *Pac-Man*.

For the record, the remainder of the votes were scattered primarily over the Activision 2600, Imagic 2600, and Intellivision spectrum, with Atari 5200 standards like *Space Invaders* winning a few votes as well.

Toward the end of this year, the Vista awards will be presented for the best games of 1983, focusing solely on this year's releases. Thereafter, they will be an annual celebration of the best and the brightest that the field has to offer. □



THE MAKING OF PINBALL MACHINES

How and Why Games Are Manufactured

by Richard Meyers

When last we left Joe Cicak, the president of Gamexxx — a Pennsylvania arcade game design house — he was telling us how videogames are conceived and manufactured. He was doing this grudgingly, because the people he designs games for have little use for Cicak's first love: pinball.

"I'm always told the same thing by the major manufacturers," he states. "Boy, we'd love to build it, but we can't invest the money because we know we won't sell more than 5000 of them. The expenditure just won't justify the return."

Videogames and pinball machines are similar in that respect, at least. It takes hundreds of thousands of dollars, if not millions, to build and test just one design. No businessman

worth his salt will want to spend that much on what he considers less than a sure thing.

Nowadays, pinball is considered less than a sure thing. "They can't compete with video head-on," Cicak confirms. "I don't think they'll die out, but we designers have to simplify, streamline, and come up with machines that are less expensive and easier to replicate."

Bally is doing its best to maintain the pinball industry by combining it with video techniques, as in their *Spectrum* game, and condensing the playfield, as in their *Baby Pac-Man* game. Gottlieb was the first to mount a videogame atop a pinball board and combine the playfields for their *Caveman* machine. Moreover, there is at least one designer trying to total-

ly revolutionize the machines.

That man is Mark Ritchie, the designer of Williams' new *Thunderball* pinball game. "I've been working on this thing for almost a year and a half," he says. "I wanted to create a cleaner playfield, a new way of playing and a whole new way of launching the ball." His machine has no stick catapult on a spring, but a cannon that shoots the ball onto the flipper. A player has to have quick eyes and reflexes or the ball will be gone.

Since pinball is a more physical game than most videos, it may follow that pinball players are more aggressive and independent. That certainly is true of pinball designers. With the advent of videogames, they must fight an uphill battle to get their designs seen and accepted.

PINBALL

By necessity, pinball makers can go it alone for the most part.

"Everybody does it differently," Ritchie concedes, "but essentially I build the thing myself. I don't let anybody touch my stuff unless there's some technical aspect that's beyond me. In other words, I don't go out of my way to get anyone else to help.

"I start with a bunch of sketches of how I want the thing to look," he explains. "I want what I think will be an attractive, eye-catching playfield based on a solid, workable concept." The term 'workable' can include both technical and aesthetic considerations. While creating a three level pinball machine with playfields that go opaque when the ball goes from one level to another might be a great idea, it may be impossible to realistically create.

"Then I make what is called a 'master drawing,'" Ritchie continues. "That will include the border, the size of the playfield, and all that." The master drawing is not only a representative piece of artwork, but a blueprint as well. "That will be taken to the company workshop, where the plywood will be sized and cut. Then the holes for the bumpers and targets and so forth will be made. The finished product is what is called the 'white wood.'"

The pinball designer then goes from being a carpenter to a toy maker. "You build all the parts you want on the white wood," Ritchie relates, "and just play around with it until you get the kind of ball action you're looking for." That means that for days, weeks, even months, the designer must use an accumulated knowledge of both math and available pinball gimmicks to create a game which will be consistently interesting to a player. He must experiment until he is satisfied. But the groundwork isn't complete even then.

"Once you're set on a playfield, you want to start working on rules," the designer says. "You know, the little extras you give the player once they've achieved a certain combination of targets, bumpers, ramps, dropholes, and whatever. Extra balls, specials, that sort of thing."

It's best that a designer also tie in his rules to the subject matter of the game. For instance, it might be a good idea to have a system of extra ball targets,

rather than dropholes, on a Dirty Harry game, let's say — while the dropholes would better serve something like a Tarzan game.

"Once the rules are straight in your own mind, and hopefully on paper, you take the game to a company programmer and say 'let's do it.' Then it is up to both of you to figure out your options. In other words, how to achieve what you want as quickly and economically as possible. You, as the designer, are directly involved with everything even though you may not know how to do things like wiring. You learn fast."

Just a few years ago, pinball making was a mechanical job. Today, programmers compute a game's rules into microprocessors, all the while taking input from the designer and fellow workers. "Someone else can come up with a great idea and slap it into your game," Ritchie admits. "That happens all the time."

"Competing against videogames is tough. We designers have to come up with machines that are less expensive and easier to replicate."

Finally, after all that work, the game is ready to be actually built. "Now comes the 'prototype runs.' That means the pinball cabinet has to be made, and that, in turn, means the artwork has to be finished.

"Again, everybody does this in different ways. What I do is present my ideas for artwork directly to an artist I trust, someone who knows what I want and the way I think. At Williams, that usually means Constantino Mitchell. He realizes my ideas on paper. From there, silkscreens are made and brought for approval to the executives in charge.

"Once everything's okayed, we start making prototypes. The silkscreens are the blueprints for all the artwork — on the backglass, the playing field, and the cabinet. The artwork is literally screened onto the machines. You lay the things down and color in the holes, essentially."

All during the process, special consideration has been given to make sure the game is durable. Even the best playing games, like the groundbreaking Atari pinball machines of the

late seventies, can be done in by faulty maintenance design.

"Pinball is not a thriving business today," Joe Cicak relates. "It's unfortunate, but it really doesn't matter how much money the machines make; arcade owners don't want to handle them. The companies may come out with a machine that'll be a far longer money maker than any videogame, but the operators won't touch it because they don't like to constantly adjust switches and fix maintenance bugs."

"When you're talking about a mechanical game," Ritchie stresses, "making it maintenance-free is nigh near impossible. As long as you have an actual pinball moving around on an actual board — not a video version — you're going to have switches, wires, and mess."

In an attempt to circumvent this problem, another stage in pinball making was created: the sample stage. "You make five or six samples and then play the hell out of them to make sure they will be reliable," Ritchie says. "After that, you make about five more and ship the ten or twelve machines all over the country to see how and what they do."

The how means the money they make. That will tell the designer how successful his concept is. The what means what kinks have to be worked out of the structural design, what bumpers have to be tightened, what switches have to be eliminated, what tricks have to be added. These suggestions are carefully heeded by both manufacturer and designer.

"We get feedback on what works, what doesn't work, and what arcade owners, managers, and players like or dislike," Ritchie says. "From that comes final adjustments. Once you do all those things, you've got yourself a game."

At last report, Mark Ritchie was awaiting word on *Thunderball's* performance in its test engagement while working on new videogame designs for Williams — who, like most everyone else, was cutting back pinball production.

"Competing against videogames is tough," Ritchie admits. "Pinball designers have to adjust their thinking to extremes. I saw the last pinball decline because of foosball and air hockey, but then I saw it bounce back like you wouldn't believe. I keep hoping it'll happen like that again."

VIDEOGAMING:

the inside story

Your videogame is a computer whose working parts are switches one-millionth of a meter wide and molded primarily from silicon — sand! Amazing? It's just one of the wonders which bring videogames to life.

by Martin Levitan



The TV comes hissing to life.

A game is selected, objects begin to move on the screen. The joystick responds to your touch while buttons cause cars to gas up or bombs to drop.

The action is fast, colorful, and noisy. It seems to "just happen."

That's not true, of course; spontaneous generation has been in Dutch since the days of van Leeuwenhoek. Like any scientific device, videogames are designed, programmed, then manufactured to work within the meticulous laws which govern your console computer. From conception to actual play, the byword in videogaming is *order* — organization which allows us to create chaos on the TV screen!

At the centerstage of videogaming is the TV itself. During gameplay, it works the way a TV set ordinarily works. The on-screen action is a series of still pictures, sixty of them flashing at us every

second, our eyes combining the individual frames into one moving picture.

Each of these separate pictures is painted by electrons. Spit from a gun in the back of the TV set, the particles strike a tube which is coated with material that glows when hit. The gun rapidly scans the screen in a series of 192 lines, each of them containing up to 280 points; thus, a single space invader can be made of as many as twenty electron concussions.

This process creates both black and white and color images. A color TV is somewhat more complex, possessing three guns — red, green, and blue — the coating on the screen divided into layers, each of which is sensitive to one color only. Again, our eyes help make the illusion work, combining the colors to create up to sixteen distinct tones.

The images which appear on your TV during videogaming originate inside the

console. If you're curious enough to follow along, turn the unit upside down, remove the corner screws, and open it up. (Congratulations! You have now voided your warranty.) In the middle of the console is a big connector where you insert your game cartridge and through which it communicates with the console circuitry. Off to one side is a large rectangular box, the power supply. Don't touch it: the pack's capacitors can give you a nasty jolt even after it's been unplugged. Suffice to say the unit's job is reducing the current found in household wiring to levels which won't melt the computer's delicate plastic-encased micro-electronics. It also provides the electronic drumbeat which keeps the videogame computer's many operations moving and coordinated.

The green plank is your printed circuit board, studded with black plastic chips. These chips are integrated cir-

cuits, electronic roadways massed onto a piece of silicon. The largest, though only the size of a pinhead, is the microprocessor.

Indulging our imaginations and shriveling to the size of something subatomic — say, an electron — let's take a closer look at what transpires hereabout during gameplay.

The microprocessor or Central Processing Unit (CPU) is the largest chip around, the "boss" chip which executes the game program instructions. If we regard the computer as a city the CPU is equivalent to the mayor, a Tammany Hall czar who ensures the smooth and normal running of events within the realm.

Every action performed by a computer involves instructions which have been stored by the designer or are entered by the player. (See ROM and RAM, below.) These orders are expressed as numbers, the computer's language being limited to ones and zeroes. Each of these numerals is called a bit, eight bits comprising a computer-language sen-

tence called a byte. Simply put, this massive collection of bytes a yes-and-no system, a means for the computer to determine whether each of its myriad switches is to open or close. Countless commands shoot through the computer every second, but if each instruction cannot be stated as a simple affirmative or negative, it's just too complicated for a computer microprocessor to handle.

How does a yea or nay network serve up videogames? Simple. The computer's switches are connected domino-fashion. This means that while the opening of one shuts a path of communication, at the same time it opens another — that path triggering similar reactions up and down the line. This mass of data emerges as on screen images, sounds, etc. Essentially, in lightning-fast progression electrons are asking, "Should I go this way?" each and every step of the game.

As we look around the microprocessor board we notice that its "buildings" are connected by a network of fine silver and copper wires, the local transit

system. The commuters in this city are those electrons which shuttle incessantly between the various locations, setting or unsetting switches and thereby moving information about.

The capacity of the computer to interpret this information is scattered throughout the districts and precincts of the city, in areas called the Read Only Memory (ROM) and the Random Access Memory (RAM). The RAM contains the volatile memory of the system, the transient information produced during gameplay and which disappears when the computer is shut off; the computer city's hotels, if you will. The ROM consists of the instructions and elements of gameplay, the city's stately old homes whose permanently stored data describes the character of the game. The ROM and RAM make certain that your videogame always acts and looks the same (ROM), yet responds to your ever-changing commands (RAM).

Looking at a chip on the sixteen metal pins that connect it to the rest of the microprocessor board — a brief look, lest we find ourselves bowled over by the many messages using the entrance each second — we find this great warehouse organized into distinct areas. Up front are registers where data and instructions arriving from the ROM and RAM memory areas check in. A program counter keeps track of whence the next set of data will be arriving, while the CPU ushers the newly-arrived instructions into the Arithmetic Logic Unit (ALU) where the group is sorted and each member given its assignment. Some wait, others hurry to the display memory area to cue the video image, still others scurry about, returning at regular intervals with information from the joysticks or cartridge.

Rather than duck traffic in this hectic center of activity, we travel to a quieter place, the game cartridge ROM. Here we find the game's instructions, the special symbols, sounds, and rules. Looking around, we notice that its microelectronic switches have been fused open or shut, a function of its ROM nature; this is what causes the game to perform the same way each time we snuggle it into the console. While the cartridge may be asked for further information from time to time, once it has performed its primary function — loading the console computer with information which makes *Fishing Derby* unique from *Yar's Revenge* — it takes a backseat to commands being generated by the players.



When the console has been primed by the cartridge, its so-called "initialization," the RAM allows the video enthusiast to do anything she or he wants within the confines of the ROM. Suppose we have a videogame in which two rocket ships are battling while they flit in and out of an asteroid field. After initialization, the patterns of the rockets and asteroids — whether drifting, thrusting, or exploding — sit around in the RAM area set aside for "objects." Input from the game controls is thereafter decoded to authorize rotation, acceleration, steady motion, laser bursts, explosions, and so on.

Here's a sample scenario. The microprocessor receives input for firing a laser. Switches fly into position building the path which orders a burst to be "painted" by the TV at the coordinates of the rocket's cannon. Concurrently, the computer adjusts other switches so that, from color to sound, every element of gameplay conforms to the present situation. What's more, if the microprocessor detects a coincidence in the latitude of a rocket with the destination of a laser burst, it orders up an explosion by dipping into ROM data for the appropriate circuit pathways to be opened, thus creating the proper graphics and sound description.

When a videogame is in this RAM mode, each of the previously mentioned dots on your TV is answerable to a bit in the RAM. This brings us back to our electron-pelted picture tube. Instead of displaying the input of an antenna, cable, or videocassette recorder, your television is showcasing a videogame. And whenever you move the joystick or press the action button, you're feeding information to the TV through the computer.

The on-screen *placement* of objects — as opposed to their above-mentioned generation — is determined by numerical increments, the joystick or paddle working like a pointer on a scale. Each number to which it ticks adjusts switches inside the computer which control an object's position. For example, let's assume your screen is a giant grid, and that there are one hundred possible locations for an object — a not unreasonable supposition. Depending upon the engineering of your game, shifting the joystick to the left may signal a setting of less than fifty, which will move the on-screen object to some point on the left, grid forty-nine, forty-eight, etc. Nudging the joystick to the right will rattle off the over-fifty numbers, shifting the object



from fifty-one to fifty-two to fifty-three and so on until you allow the joystick to spring back to neutral. This kind of current control is similar to the working of a light dimmer, except that twisting and turning orders an object into position instead of adjusting brightness.

All of the actions discussed in this overview surge through the computer circuitry at a staggering rate. The CPU in a videogame will execute some 500,000 elementary mathematical instructions per second, though components in more sophisticated computers can handle up to ten *billion* commands in that same time. (Nor are scientists content with paltry billions: they're working on supercomputers which will process trillions of calculations per second. Though such technology transcends the current needs of videogaming, it will vastly enhance scientists' capabilities in areas such as weather forecasting.)

As you can see, videogame entertainment does *not* "just happen" the only unpredictables are the outcome of the game and the joys and frustrations experienced by game designers while programming their brainchildren. □



Peripheral Vision

If you think Computer Science is difficult, watch what happens when biology enters the picture.

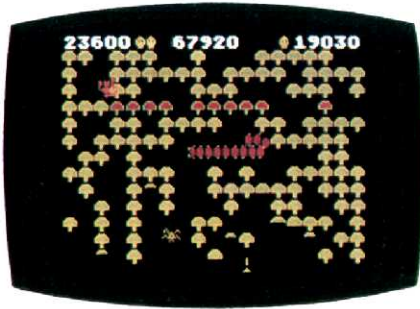
Mentioning the noted microscopist Anton van Leeuwenhoek (1632 - 1723) brings to mind his present-day counterparts. However, scientists these days are doing more with microbes than merely studying them beneath a lens: they're planning on using the mites to build computers.

The dream computer is one which would not use switches to flick on and off, but molecules. These tiny objects are extremely flexible, quickly becoming agitated when heated slowing when cooled. They'd make perfect little yes-and-no sentries inside a computer.

The trick is threading tiny wires through this microscopic matter. The proposed solution? Bacteria.

Scientists are currently exploring ways to genetically change bacteria so that they'll build frameworks from protein, skeletons to which molecules would readily hold fast. This process is fundamentally the way nature manufactures chemicals, though it has never been used to construct artificial "life" like a computer.

Is this the first step in creating a sentient mechanical mind? Could be, but scientists insist we won't see such a machine for decades.



Continued from page 20
BEST 5200 GAME

Voting in this category must be qualified.

This Atari supersystem is three months old and, of the dozen cartridges now on the market, all are either home versions of arcade games — *Missile Command*, *Galaxian*, *Space Invaders*, *Pac-Man*, *Centipede*, *Defender*, etc. — or sports cartridges. There isn't a bad one in the lot.

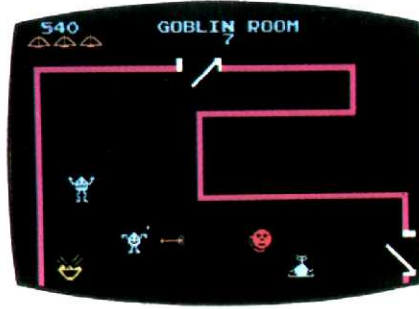
Because *all* the graphics are good, all the gameplay faithful to the source, personal prejudices had a lot to do with voting. For example, most of the voters are arcade buffs and not sports buffs: comparing *Soccer* to *Defender* was thus not an easy task — which, incidentally, was why a separate sports category was created for systems with a great many good sports cartridges.

Centipede took the prize as best game for the 5200. Ironically, voters who do not like trakball games found themselves getting into *Centipede* for the first time because of the option of using the superb 5200 joystick.

The most common accolades heaped on *Centipede* were the fact that, because of the different mushroom patterns and way the face of the game changes with every different shot, you must be constantly alert; also applauded was the ultra-quick response of the gun and rapid-fire at close range.

Pac-Man took second place, the old standby showing unparalleled devotion among fans.

Defender came in a remote third with *Space Invaders* and *Missile Command* just making the list. A post-voting, informal poll showed that these placed relatively low because: while *Defender* is a fine game in its own right, it is the least faithful translation of an arcade game to the 5200 format; *Space Invaders* is just not as novel or challenging as it was years back; and *Missile Command*, again, a great adaptation, just didn't have the following the others had.



BEST COLECOVISION GAME

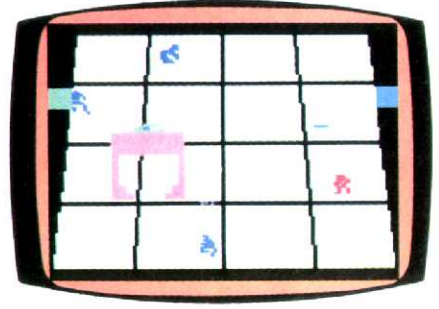
There were a few raised eyebrows among devotees on the staff and off when *Zaxxon* didn't run away with this — and, in fact, came in third. It was an easy third, but surprising in that *Zaxxon* is usually pointed to as indicative of the "class act" that ColecoVision represents. It's thought that *Zaxxon's* higher placement in the category of BEST ARCADE ADAPTATION may have cost it votes here. *Turbo*, which came in fourth and is magnificent in its own right, actually took some criticism in its capacity as an adaptation, but placed high because of the novelty and effectiveness of the steering wheel/accelerator expansion modules.

Having said that *Zaxxon* weakened its chances here because of the arcade category, it's ironic that arcade games won first and second place. However, it must be pointed out that these never received the exposure or earned a following to match that of *Zaxxon*.

Venture was voted the best ColecoVision cartridge. For the record, it also placed fourth in our BEST CARTRIDGE category. Frenetic, individualistic, very demanding gameplay was given as the primary reason for the selection, though a large majority of voters also cited the superb musical accompaniment and the delightful design of the cyclopes, skeletons, and other nemeses as having influenced their balloting.

Ladybug took second place, though barely, over *Zaxxon*. This wasn't just spillover affection from *Pac-Man* fans for this eat-the-dot motif: voters pointed to the revolving doors and distinctive, ever-changing scoring opportunities as having influenced their selection.

With only half of ColecoVision's announced cartridges currently on the market, it will be interesting to see how these games fare against future Vista winners.



BEST GAME BASED ON A NON-ARCADE MEDIUM

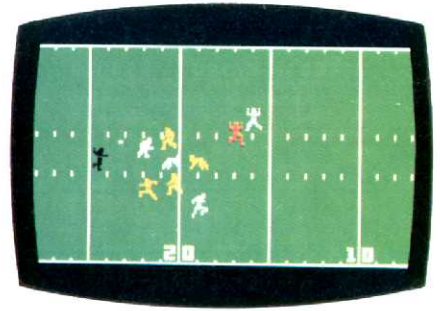
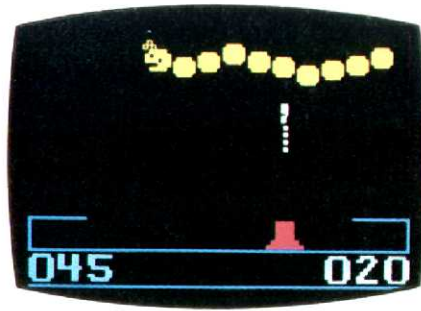
This category gave us some of our least-decisive results. First, there were the movie adaptations: the two *Tron* games, *Fantastic Voyage*, *Megaforce*, *Alien*, etc.; then there were the adventure or comic strip characters, such as King Kong, Spider-man and Superman, while the realm of youth-oriented properties gave us Intellivision's two *Electric Company* games, plus ColecoVision's twin Smurf cartridges — among others.

Knowing that there are such hot licenses as Strawberry Shortcake, James Bond, had many voters wanting to put this category off until the end of the year to make it more complete — but then, we'd only have been able to vote on the games released in 1983. After all, it would hardly do to say that "such-and-such" are the best games licensed from another medium, and then have *Lord of the Rings* or *The Incredible Hulk* appear and blow them out of the water.

As it stands, two games did place first and second, though voting was so evenly spread over the other tie-ins that third place had three ties (*Fantastic Voyage*, *Tron: Deadly Discs*, and *Journey/Escape*), and fourth place two.

Parker Brothers million-seller, 2600 compatible *The Empire Strikes Back* took first place. Fidelity to the motion picture was a factor in our voting, though embellishments such as the ability to land the snowspeeder and refuel, the fore- and background landscapes, the ability to hover around the AT-ATs and sting like a bee, and the *Star Wars* theme music all influenced the award.

Superman came in second, despite what were roundly acknowledged as "wanting" graphics. Several voters remarked that the game has "charm," and were highly complimentary of the many cityscapes Atari packed into this 2600 cartridge, as well as the



countless ways Superman can be navigated through those panels. The fact that this is a game which pits only one player against the clock (ie, against him or herself) was also judged to be an asset.

(A complete guide to conquering *Superman* ran in our first issue.)

BEST ARCADE ADAPTATION

Once the 5200 was pit against ColecoVision — the systems in which arcade adaptations have inarguably had their finest showcases — voting got very tight.

Affection for the 5200 *Pac-Man* helped win it first place, despite the fact that the home screen is still wider than it is tall. It beat *Centipede* because, in the opinion of many voters, while *Pac-Man* gameplay may not be as inherently exciting, the 5200 cartridge managed to bring to the home screen the personality of the gobbler and the ghosts.

However, *Centipede* was also topped by *Zaxxon* — but only in the sense of being a faithful arcade adaptation (see BEST GAME, below). Voters who did not even care for *Zaxxon* in the arcades voted for it here, commending Coleco's programmers for bringing the incredible graphics home with only a minimal sacrifice in terms of gameplay.

Centipede earned itself third place, ColecoVision's own edition of *Donkey Kong* fourth.

For the record, the pinball-like games were included in this category, though none received any votes.

BEST EDUCATIONAL GAME

This is a fairly limited category at present, and there really was no contest here. Although games such as Atari's *Hangman* and the two *Electric Company* cartridges got token nods, the runaway winner was *Sid the Spellbinder*. No one praised the game for its

originality; rather, it scored because of its full use of the Odyssey keyboard and Voice for instructional purposes.

Conversely, *Word Zapper* from U.S. Games' Vidtec line squeaked past Odyssey's *Nimble Numbers Ned* because it managed to disguise its educational value beneath layers of very appealing action.

In case you're not familiar with this cartridge, children must use the *Word Zapper* ship to shoot letters scrolling past, nailing them in perfect order and thus matching words which had been flashed on-screen before the action began. Simultaneously, they must fend off an attack on the *Word Zapper* ship from Bonkers, Zonkers, and the dreaded Doomsday.

Odyssey's *The Great Wall Street Fortune Hunt* was mentioned by several voters as the best educational game for adults, though it did not get sufficient votes to compete with the youth-oriented games.

BEST 2600 SPORTS

Voting was very heavily split in this division.

All of the new Atari RealSports (*Football*, *Baseball*, and *Volleyball*) and M Network Super Challenge sports (*Football* and *Baseball*) took votes, as did various other games such as Activision's *Tennis* and Atari's old *Video Olympics* cartridge. Thus, the winners do not represent a clear majority.

There was, in fact, a tie for first place. The Super Challenge *Baseball* and RealSports *Baseball* actually tied *twice*. At first, we had resolved to have no ties and sent the two back in a separate ballot: they came back tied. The fact that neither of the two companies' football cartridges placed near the top is indicative of the fact that, in the judgement of the voters, they are less successful adaptations of these games than the baseball cartridges and, in and of themselves, offer less exciting gameplay than games such as *Tennis*

and Atari's *Basketball*, both of which placed higher (five and six) in the voting.

Second place was a surprise. Several voters had expressed the opinion that a racing game like Activision's *Dragster* or *Grand Prix* would take the prize for originality and graphics, respectively — or that the popular new *Sky Jinks* would make an athletic showing.

Not so! The cathartic, beautifully animated Activision *Boxing* won second place, even though it has not been one of the company's more successful cartridges in the marketplace.

Atari's *Video Olympics* came in third for its variety and gameplay, despite the *Pong*-like graphics, and *Dragster* did manage to land fourth.

BEST INTELLIVISION SPORTS

There was no contest here for the number one spot. The perennial favorite *NFL Football* blitzed all the competition, winning more than half the votes. The ability to program plays, pass realistically, and maneuver the players effectively were given as overwhelming assets; the only drawback cited was that it takes two or three hours just to get the feel of the game.

Another surprise, here: none of the other team sports made it into the top three. Second place went to *Horse Racing*, which was complimented not only as being one of the great party games, but for its faithfulness to the experience of going to the track ie, performing to the odds with the usual smattering of upsets, providing different length races on varying surfaces, allowing for exactas, and permitting the players to bet-away without losing a cent.

Boxing took third place, barely edging out *U.S. Ski Team Skiing* and *PGA Golf*. This was not viewed as a bad reflection on any of the three games, or those individual sports. All were deemed superbly evocative of their real-life counterparts.



“BUT CAPTAIN KIRK HAS ONE!”

Even if you don't have a four hundred crewmember starship to run, there are many good reasons to own a computer.

by Martin Levitan

I remember when I uttered those fateful words, “Fine. Okay, you convinced me. Wrap it up.”

I handed over the check and the salesperson gushed, “Congratulations. You've just purchased a nice addiction to your family.”

Slip of the tongue I thought, recoiling slightly.

The salesperson slid the box across the countertop then smiled. “Be seeing you.”

There was something ominously familiar in those words. It took me a while, but on the drive home I remembered where I'd heard that expression: on the classic TV show *The Prisoner*.

The Prisoner — humankind as captives of impersonalized technology. Victims of progress. Prisoners of art-crushing, spirit-sapping, initiative-robbing machinery.

In the cold gray light of that first weekend with my purchase, I stared at it sitting innocuously on the dining room table. I snickered nervously, “Is this thing going to turn me into a zombie? Have I fallen for all the hype and media push? Now that I'm the proud owner of a personal home computer, did I *really* need one?”

There are eight million stories similar to mine, people who have experienced that same anticipation-cum-terror as they stared for the first time at the keyboard of their new computer. Billions will undoubtedly share those qualms in the future.

Yet, some months after the fact I can report with confidence — indeed, with rapture — that buying a computer was a wise decision.



Though videogames have traditionally been a stronghold of male wish-fulfillment, men and women benefit from the personal computer.

A decade ago, no one in their wildest imaginings would have thought they'd be turning their spare room or kitchen into a part-time computer lab. But according to *Business Week*, that's exactly what's happened.

"Since 1976," the magazine reports, "the market for personal computers has grown from scratch to \$6.1 billion in worldwide sales this year. By 1986 sales are expected to climb to \$21 billion."

Much of the growth in the home market stems from the emergence of videogames as a national love affair. In the wake of this explosion, kids and grownups alike quickly discovered the more sophisticated computer games, after which educators jumped in with teaching aids and "courseware" to capitalize on the charisma of the computer screen.

Before anyone realized what was happening, these enthusiasts had found a multitude of tasks for which *any* homeowner could use computers.

Simultaneously, technology brought the computing power of a one million dollar machine down to a price tag of two thousand dollars. More recently, basic computing has become available for household use at a cost of from one hundred to five hundred dollars.

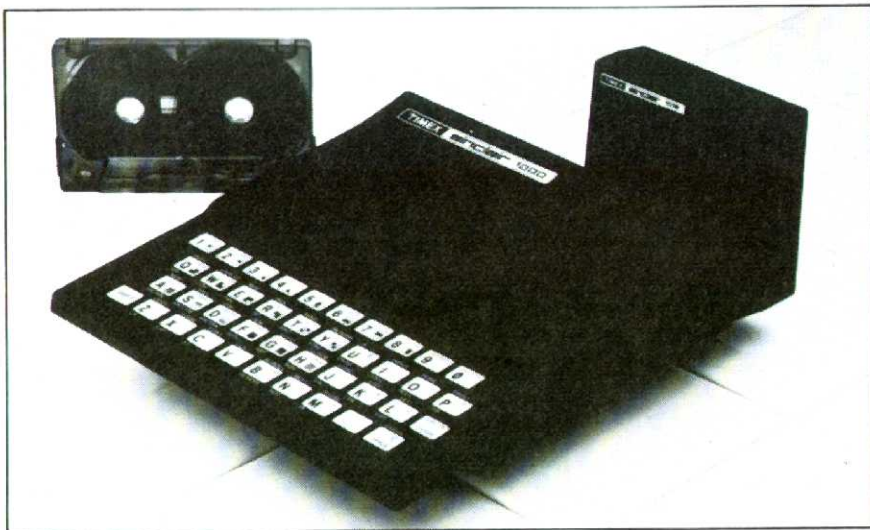
But the big question, the downright *nasty* question which many people still ask is just *how* useful is the home computer? What can the *average* person do with it? Isn't it really just one more big-ticket gadget we don't need? Or as one critic summed it up, are computers "a silly distraction, or the next great home tool?"

Let's examine the question.

A general purpose computer must be programmed to be useful. That in itself sounds intimidating to most people, but what it means is that you've got to put a disk or tape into the computer which will cause its dormant circuits to snap-to and prepare to perform certain functions. Those functions are determined by what's been stored in the given program, whether it's *Spider-man* or *The States and Their Capitals*.

These programs can be bought — canned, like a videogame cartridge — or you can write them. Writing a program is not as impossible as it sounds: it's simply a matter of typing in the parameters of what you want the computer to do every time that particular tape or disk is used.

Thus, just to point out the difference



The TS 1000, with its buttonless "membrane" keyboard, sold 600,000 units in 1982. A more powerful version is coming this spring.

between a full-fledged computer and videogame system, the latter lets you play games others have invented, while the computer lets you play your own design. The difference may not be as severe as, say, paint-by-numbers vs. the work done by Titian, but there is an element of creativity involved in programming your own. More on that later.

Most of the non-game programs the average consumer will use are of the plug-it-in variety. Let's state right upfront that they usually don't do anything you couldn't have figured out with a paper and pencil.

What, then, is so special about a computer?

A number of things. First, it makes routine and mundane tasks like keeping a checkbook pass more quickly, in a more orderly fashion, and — let's face it, computers are more fun to use than a leaky Bic.

Ah, but are they cost-justified?

That depends upon the value you place on your time. And how clever you are. How would *you* go about making your house more energy efficient, compare budgets vs. inflation, install a security system, etc., etc., etc.? You'd probably call in experts, sit for hours with legal pads, and call in more experts, respectively. And you'd spend, in the process, more than three or four times the cost of a simple computer.

But we get ahead of ourselves. Back to the checkbook.

The amount of effort required to keep a checkbook by computer is roughly the same as keeping it by hand. However, the computer rewards

you with a balanced checkbook, and more. Touching a key allows you to see how this month's spending pattern compares to that of last month. Or the month before that. Or eighteen months before that.

Checkbooks are no big deal, you say? You're not impressed that this new member of the family can keep financial records? Fair enough. Let's poke around and see what else it can do.

The computer can save energy by controlling your home's heating and cooling systems. It can help to evaluate solar projects and weatherization options, or store recipes and help devise diets to suit the nutritional needs of the family. With the proper attachments, it can turn lights on and off while you're away — in much more sophisticated fashion than those little gadgets you plug into the wall which wouldn't fool anybody intent on robbing the place — monitor smoke and burglar alarms, even call the police or fire department.

Name any tool which can do all of the above and also educate your children. Not *only* educate them, but do it in a way which will leave 'em begging for more!

Nor should we gloss over adult education. With the proper communications accessories, a home computer can link you into international data banks filled with information on almost any subject you might want. Within the next year or two, it will help you do your shopping and banking from home, as computers are presently doing in test markets around the nation.

Nor should we forget the job market. Even if you have no interest in computers, think about the future. You or your kids are going to be entering a job market full of computer hardware. Want to lose out on employment because you don't know a keyboard from Kahlua Pie? You didn't hesitate to learn tennis to get ahead in the office; why not learn computers?

As I mentioned earlier, you don't have to spend thousands of dollars to get a basic computer. The cheapest preassembled home computer currently on the market is the TS (Timex-Sinclair) 1000. Carrying a one to three hundred dollar price tag, it will perform most of the tasks done by much larger and more expensive systems, though in not quite as sophisticated a manner.

(For \$49.95 you can add a unit which will allow for more advanced work; it isn't necessary, but at least you can buy the computer and feel as though it won't become instantly obsolete.)

Most Timex-Sinclair prepackaged software is available for under thirty dollars. We've given over most of the space in the following software primer to that beginner's unit. However, whether you get the TS1000 or an Atari 400 or 800, an Apple, a TRS-80, or any of the other computers on the market — all of which we'll be covering individually over the next few issues — here is a brief review of the software which is presently available.

Games

Games are the most relaxing use for home computers. The graphics are better than most videogame systems, and the range of titles is far more extensive.

Home computers are strongest in the adventure and strategy categories, games such as *Ulysses and the Golden Fleece* and *Time Zone* which were covered in previous issues. There are thousands of games on the market, of



The brand new Atari 1200XL is the latest, sleekest, and fastest-selling addition to that company's catalogue of home computer hardware

which the largest number are Apple-compatible. Prices range from twenty to one hundred dollars apiece, depending upon the game and the system.

For beginners, the games available in the TS1000 format include *The Flight Simulator*, *Chess*, *Backgammon and Dice*, *The Gambler* (blackjack and slot games), *The Cube Game*, *Grimm's Fairy Trails* (sic), and *The Mixed Game Bag*. All sell for under twenty dollars, some for less than ten.

Finance

The TS1000 has a surprisingly good cross-section of home finance programs to help you organize and analyze your life.

The Organizer, a general-purpose information storage and retrieval program, emphasizes user friendliness (ie, it's simple to use) and detailed visual display. It helps you store names, addresses, phone numbers, birthdays, anniversary dates, and so on.

The Budgeter can keep track of your personal expenditures in eighteen different categories, such as food, clothing, rent/mortgage, medicine, education, and many more.

The Loan/Mortgage Amortizer helps you to compare the costs of loans from different banks — loans you're sure to need when you're hooked on computers and upgrade to a more powerful unit.

The Checkbook Manager stores transactions and sorts them in useful ways. You can hold up to 3,600 transactions on a single tape.

with a program like this.

The Car Pooler, *The Stamp Collector*, and *The Stock Option Analyzer* are also TS1000 programs. All of these programs sell for between fifteen and twenty dollars. One can purchase them separately or, instead, buy a single program which stores, retrieves, and processes all of this data in separate files.

Want some other areas in which you might use these "data-base programs" (that is, programs which use the computer to do what you formerly did on index cards or in notebooks)? How about keeping track of your videotape library, storing data on family trees, compiling sports statistics to dominate that office pool, creating personal dictionaries, keeping a current grocery list (with notations about when the milk and yogurt expire), cataloguing menus, maintaining stock market histories, and even updating "little black books."

Educational Programs

These can be used to supplement a child's formal education or help an adult keep up in his or her studies. Most of these programs are in the form of drill and practice, simulation, or computer-assisted instruction. Prices range from thirty dollars to \$150.

This is the biggie. There's no escaping the fact that children, today, are video-oriented. Parents and educators rail about this, but it's like death and taxes: the TV is not going to go away. What the computer does is use this interest to feed kids some education.

The Coupon Manager, as the name implies, is for coupon-clippers. This one's a real pip. It has the capacity to tell you what each coupon is for, where it's honored, the date through which it's valid, and lists each by store or type. Remember when we mentioned cost-effectiveness a while back? A family of four can shave twenty percent or more from their grocery bill

Many teachers have already recognized the value of computer literacy. For one thing, kids who use computers quickly see the necessity for precise communication, do not have to be reminded that spelling, punctuation, and grammar "count." For example, if you've got a file code-named "irresistible," and you keep punching in "irresistable," you're going to stare at a blank screen for an awful long time. Many adults would benefit from exercising some of those skills.

Schools have always had trouble teaching "real" problem-solving skills. Computers provide an environment full of real-world problem solving, simulations of actual tasks to-be-accomplished, from building a nuclear reactor to writing a resume and having the computer hire you or not. There are real-life constraints with which to deal, complicated by the dilemma of many possible solutions. These are slices of life situations which can't be as effectively communicated or experienced in a textbook, or in a self-conscious, high-pressure classroom situation.

For slow and fast students alike, computers permit them to work at their own pace without fear of being left behind. Indeed, in the case of slower students, mastering computers is itself a means of boosting often fragile self-respect.

Education aside, computers have demonstrably broken the hypnotic spell of television. Computing is not passive entertainment, it's interactive. What's more, it bonds parents with their children, gives families a dynamic opportunity to share in an activity, in problem-solving, game-playing, in mastering technology. Families can still sit around a *Monopoly* board or cross words over *Scrabble*. You don't have to sacrifice one for the other. Just remember, despite what Bette Davis said in this magazine two issues back, that's a two way street.

There are hundreds of educational programs on the market, and their quality and subject matter varies greatly.

Environment Control

The last category is one which can really save you a bundle. By hooking your computer to special control devices and sensors, you can not only monitor heating and security systems, but run appliances as well.

At the moment, the cost of the hard-

ware necessary to do this is beyond the reach of the average computer user. Give it a few years and you'll ever wonder how you allotted oil without your handy little keyboard.

These prepackaged programs we've been discussing aren't always easy to fit into categories. For example, I leave it to you to place one called *Eliza*, which turns your computer into a psychotherapist.

There there's *Dietary Analysis Program* which scrutinizes your daily food consumption for vitamin, mineral, and caloric content.

Still other computer packages promise to perfect your pitch, teach you to read music and, that done, help you start writing tunes. Someone even rigged an Apple to rock the baby's cradle everytime she cried.

Rube Goldberg would be proud. I know my wife was.

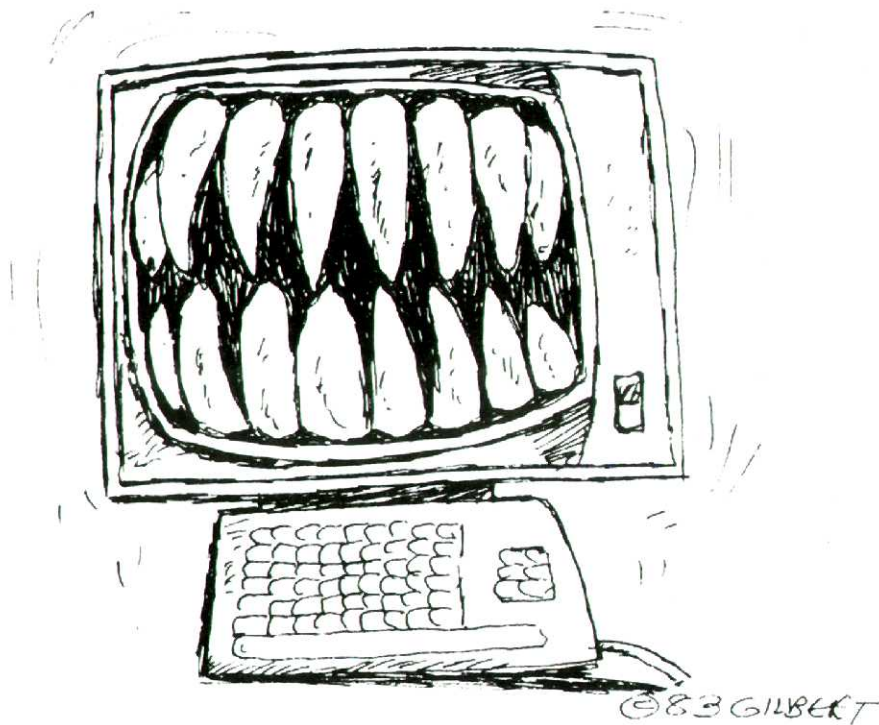
People who work with computers gain many intangible benefits as well. They learn the self-confidence that comes from making an hitherto mysterious machine do their bidding. This is important, for as technology plays an increasingly more important role

in our lives, we need to develop a sense that we control machines rather than vice versa. The fact is, Arthur C. Clarke notwithstanding, computers really *do* behave just as you instruct them.

What about that element of creativity we mentioned earlier. Some people can't draw or haven't an ear for music. The computer can serve as a paint brush or piano, be a tool and tutor both. This isn't to say that we should take an axe to musical instruments or toss our easels out the window. It means that computers can take some of the scare out of *those* pursuits as well.

If all of the above fails to convince you, consider this: if you don't start using computers, all those big corporations are going to stop making them. And then, like the zeppelin, computers will become extinct. You may not want to make your own life easier and fuller, but think of the future. Whatever will Captain Kirk *do* if, through our neglect, he ends up facing the twenty-third century with nothing more than a pocket calculator?

Next issue: the Atari computers. □

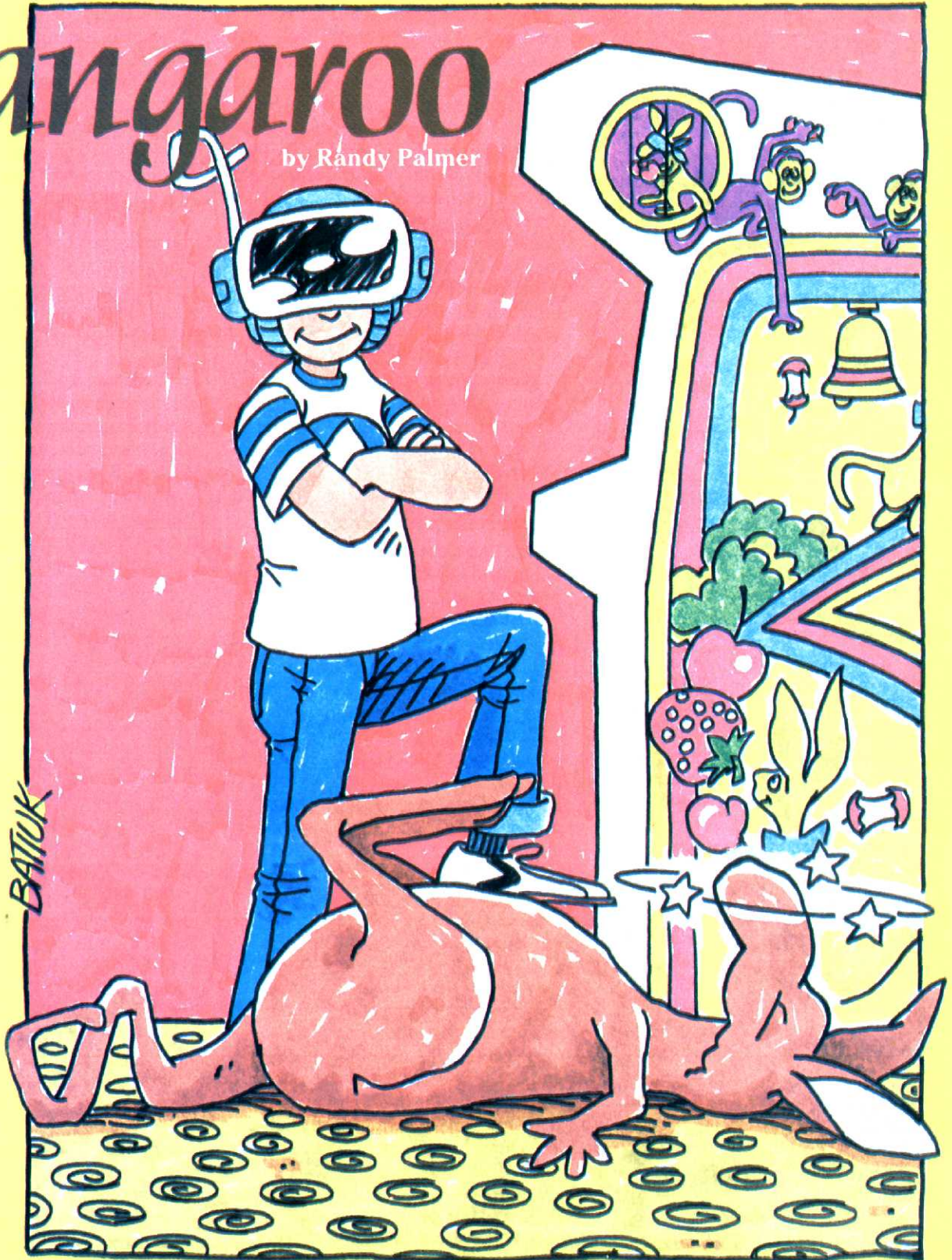


Feed me! I want more memory, new disks; more joysticks; MORE... MORE... MORE...

conquering:

Kangaroo

by Randy Palmer



Lace up your boxing gloves, it's time to out-fox and out-box Atari's Kangaroo.

KANGAROO is comprised of four screens, each a multi-level structure brimming with valuable fruit and deadly, apple-throwing Monkeys. The object is to help the boxing Kangaroo to save her baby who is imprisoned in a tiny cage, usually near the top of the screen.

The player controls the Kangaroo's movements by manipulating a three-function joystick and a "Punch" button which causes the Kangaroo to extend a mighty limb, thereby kayoing the enemy confronting it.

The versatile joystick functions as follows (see diagram):

To move the Kangaroo right or left, push the joystick to either side.

To crouch or duck, pull the stick down.

To jump, push the stick up.

To make a Super-Leap, push the stick to either side at a forty-five degree angle.

The joystick in *Kangaroo* is very sensitive, and it's easy to make a mistake.

For instance, if you want to move to the right, you may instead make a "super-leap" if you're not careful. The best way to keep things under control is to keep a tight grip on the joystick, pulling it *slightly* downward at all times except when jumping or leaping. When you want to make a jump, push the joystick up sharply, then quickly bring it back to its original position. Otherwise, the Kangaroo may jump several times in a row, making it an easy target for the apples and cores thrown by the mischievous Monkeys.

Scoring

Points are acquired by crossing or jumping to pick up various pieces of fruit which decorate the screen, and kayoing the Monkeys.

The fruit-points are as follows:

Strawberry — 100 points

Tomato — 200 points

Cherries — 400 points

Pineapple — 800 points

Pieces of fruit are advanced to the next-highest value by having the Kangaroo jump up and ring the Bell. There is one Bell on each screen.

Ringng the Bell, however, will only advance those pieces of fruit which have already been "plucked."

For each Monkey knocked down, the player is awarded 200 points. If you manage to hit an Apple in midair, 100 points are awarded. Hitting a falling Apple *Core* is worth 200 points.

In Screen Three, each Monkey punched out of the "Monkey Column" is worth 400 points. Successfully hitting the Big Ape is worth 800 points.

Kangaroo also awards players Bonus Points at the end of each round. This may mean anywhere from 100 points to 2,000 points, depending on how fast a screen is completed.

Screen One

Don't pass up any fruit. Always take the time to make a jump or Super-Leap to get it — and the points that go with it.

Try to use a super-leap to get at the fruit unless it happens to be hanging directly over a ladder. Standing in place and jumping wastes precious seconds while the bonus points dwindle away.

Don't go for fruit when a Monkey is about to toss an Apple. If you do, you may find that the Kangaroo lands not on its feet, but on the Apple. Consequence: you've lost one of your allotted marsupials.

Punch out any Monkeys that you encounter along the way to the top of the screen. Ascend ladders without hesitation.

When a Monkey throws an Apple, the player must either jump *over* the Apple or *duck* it, depending on the height of the Apple. Some will be thrown low to the ground and must be jumped; others will travel at a higher level and must be ducked or punched. Until you are experienced at the game, it's best to duck the high apples instead of throwing a punch at them.

Bonus Points are not the richest commodity in *Kangaroo*'s first screen. Go for the fruit and kyo the Monkeys. Try to reach the Bell, ring it, then turn

around to pick up the new fruit.

Not all of the fruit has to be picked up to advance them to the next point value. You can easily ring the Bell after picking up 100 points for a Strawberry, and return to pick up 200 points for the Tomato which will appear. Ring the Bell again, go back and pick up the Cherries; ring it again and return to pick the Pineapple. The Bell will then disappear, and you've scored 1,500 points without much effort at all. Add to that the points you won on the way up, and you've already broken what might be earned through Bonus Points by racing to the top!

The falling Apple Cores are relatively easy targets; go for them. Stand a safe distance away, for if they strike the Kangaroo it's a goner; time your punch and hit the Core as it plunges by.

Above all, keep your eyes on the Monkeys as much as possible. You don't have to watch the Kangaroo to know where it's moving. But you *do* have to be ready to jump, duck or punch the Apples as they come your way.

Lastly, be careful when moving up the final ladder to rescue Baby 'Roo. A stray Apple Core may bonk its mother on the head! Wait at the bottom of the ladder — with an eye to the side, watching those Monkeys — until the baby is headed toward the *right* side of his cage. Then move up the ladder to complete the screen.

Screen Two

Again, the player must reach the top-most portion of the screen to save Baby 'Roo. This is the first screen, however, in which there are *gaps* along the way through which the Kangaroo may fall.

Because this screen is fairly hazardous, it's best to concentrate on kayoing the Monkeys and getting to the top, rather than ringing the Bell and going back and forth, up and down, to pick up high-value Fruit.

To get the Kangaroo successfully across the lethal gaps, the player must use the Super-Leap function. Even then, however, the danger is not over. Even when using Super-Leap, the Kangaroo still does not make *too* great a leap. If

your timing is not spot-on, she may plummet to her death.

To cross a gap, wait until the Kangaroo's feet are dangling just a bit over the edge — *then* push the joystick into the Super-Leap mode. The Kangaroo will make it safely to the other side. But be cautious! The animal will fall through the gap if its toes dangle *too* far over the ledge! See the diagram for guidelines.

Screen 3

The "Monkey Column" is the main feature of this screen. The statuesque Monkeys must be punched out from beneath each other so that the cage in which Baby 'Roo is imprisoned can come down to ground level.

It takes several punches to knock a Monkey from the column. Meanwhile, your Kangaroo will be assailed by falling Apple Cores and tossed Apples. Watch out for them! You'll be required to do quite a bit of jumping and ducking in this screen.

Ignore the Fruit on Screen 3 and concentrate on knocking away the Monkey Column. As a Monkey is pushed from the Column, any approaching Monkey — they will approach from the *right* side of the screen — can be kayoed if the Monkey from the Column is pushed out at the *same time* another Monkey approaches.

You'll manage to beat apart the Column a lot faster if you *let go* of the joystick and place one hand on *each* of the two Punch Buttons. Tap each one rapidly in succession, as if you were playing a set of bongo drums. Just be prepared to grab the joystick when you see an Apple being thrown your way. It might take a little practice to get good at this maneuver, but it's worth it.

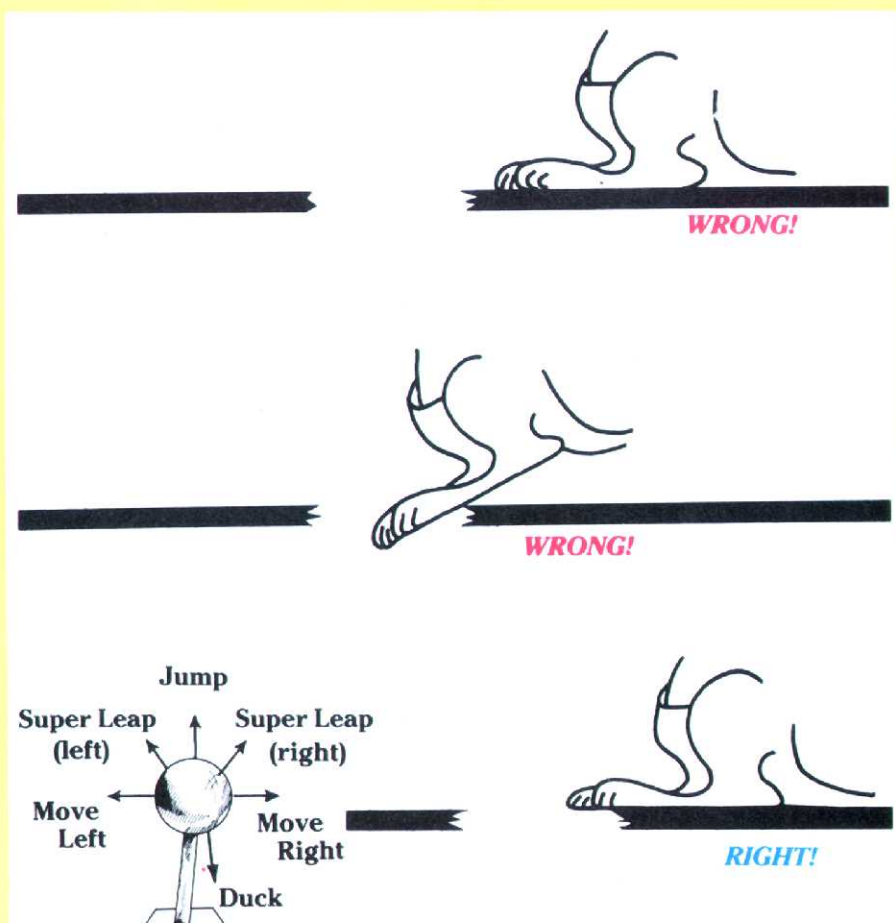
As you club the Monkeys from the Column, other Monkeys will move across the board to replace them. You'll always be ahead of them as long as you keep punching.

When there is just one Monkey left in the Column, it's not necessary to knock it away. Simply grab the joystick and Super-Leap up onto the platform. You've saved Baby 'Roo again!

Screen 4

The last screen. After this, *Kangaroo* goes to Difficulty Level Two, and repeats the previous screens at a more trying pace.

Once again you must ascend ladders to reach the top of the screen. Only this time, our Simian friends can move up



and down the ladders, something they weren't able to do before.

Use the utmost caution when climbing the ladders of Screen Four. Monkeys will toss Apples from the side or from above, and it is impossible to leap or duck while on a ladder. Move as quickly as possible to the top. Take the route of the Fruit, but don't go out of your way for it. The most important thing now is to *survive*.

Rotten Apples

One thing to keep in mind throughout all four screens in *Kangaroo*: stay a safe distance from Monkeys who are preparing to throw Apples. If the Kangaroo is perched right next to them, there will be no time for the player to see whether an Apple is being thrown at middle or low level. Leave sufficient distance so that you can make a determination.

Also, don't "jump the gun" when preparing to dodge an Apple. If you duck before the Apple is thrown, it will home right in on the Kangaroo — unless it's far enough away from the Monkey that you can subsequently make a jump — and vice versa.

The Big Ape

Dallying too long on one screen will result in the Monkeys calling on their "big brother" to beat you up! The Big Ape is fitted with boxing gloves ... and he has a mean reach!

Stay a safe distance from Big. Wait until he throws a punch, then move in quickly and swat him. He'll be knocked down clear across the screen and into the circuitry!

Fortunately, being punched by the big guy doesn't kill the Kangaroo, but her boxing gloves will be bandaged, thus hampering her skill to effectively deal a knock-out punch.

In Conclusion

One word of caution: *Kangaroo* looks easy, but it isn't. You'll be tripped up by those devilish little Monkeys more than once.

Don't let them get you down! Just take the megrims on the chin and, as that popular boxer of last summer would say:

"Go for it!"▲

conquering:



Dig-Dug

How to inflate your foes and your ego

by Chris Ochsenskiel

There has been an increase in the amount of maze games introduced since *Pac-man* became the most popular game in the nation.

One of the most recent and popular games in this style is *Dig-Dug*, which was created to dig its way into your heart, and has dug deep into our pockets.

The object of *Dig-Dug* is to guide a little figure in an asbestos suit through the ground to kill Fygars and Pookas before they reach you. Fygars are little green dragons that breath deadly fire and are worth 200 to 1,000 points when blown up. Pookas are little orange monsters worth 200 to 500 points when blown up.

There are two ways to kill the monsters.

The first and most obvious way is to run up to a monster and pump him up. This is accomplished by rapidly pushing the pump button while running forward. Continue doing this until the enemy blows up. When having at the monsters, be sure not to let any of them touch you because: they kill on contact. Only when the monsters are partially or fully inflated is it possible to run through them without getting killed.

The second and most profitable way to kill the monsters is to dig a tunnel up under a rock and drop that rock on as

Continued on page 73

conquering:

Q*BERT

*Forget everything you've learned about beating other videogames. Q*Bert is unique.*

By Randy Palmer



Before you can begin to conquer Q*Bert, there is one thing you must keep in mind: think three-dimensionally.

There are nine levels in Q*Bert, each comprised of four screens. All the screens are exactly the same in that, unlike a game such as *Donkey Kong*, you're not going from Ladders to Elevators. This game requires that you jump from cube to cube with occasional forays onto an elevator Disc.

The difficulty level increases with each screen you vanquish, and substantially so. But each screen retains the same basic design.

The stomping ground for Q*Bert is based on the famous hollow cube (whence "cube-ert") which, if you glance away and then look back, seems to turn inside-out. That kind of geometric illusion-making should tip you right off that Q*Bert is a game of logic, not reflex.

It's interesting to note, in light of this, that people who are not videogaming fans find themselves enjoying Q*Bert while experts at games like *Tempest* and *Defender* tear their hair out trying to reason rather than battle their way through a game.

There is only one control in Q*Bert, a rather unusual joystick. It allows you to jump up/left, down/left, up/right, and down/right.

At the arcade operator's discretion, you start with three or five Q*Berts,

and a new Q*Bert is earned at scores from six thousand to eleven thousand points.

Speaking of scoring, twenty-five points are earned each time you get Q*Bert to change the color of a square to the Target Color; that is, hop onto a cube and change it to the color depicted in the upper lefthand corner of the screen. The Target Color is different for each screen in every level, though the same from game to game.

(For example, in level one, screen four, all blocks must be changed from blue to yellow.)

The higher levels of play require Q*Bert to hop on each block twice, first to change it to an intermediate color and then to the Target Color.

The Discs

On a given screen, anywhere from two to seven multicolored spinning Discs will be located at either side of the Pyramid, and occasionally at the very top block. They don't move unless Q*Bert is on them, at which point they take a two-to-three second flight to the top of the Pyramid. These flying elevator Discs enable you to lead the serpentine Coily to its death — more on which in a minute.

Do *not* jump onto a Disc too early, otherwise Coily will still be alive when Q*Bert is deposited back at the top of the Pyramid. You've got to get on when the creature is close to the edge.

Coily

Coily the Snake will come out during *every* board. The creature appears first as a rather large, purple ball which will drop to the bottom layer of the Pyramid and, moments later, spring to life.

Coily will snake up the Pyramid, following Q*Bert move-for-move. The monster can't skip a cube to nab you, even if its on an adjoining cube. It gets you when *you* get careless and retrace your route, stepping in its path.

Don't squander potential points by *not* using the Discs. Since Coily will come out on every screen, try to use up all the available Discs by leaving at least *one* block unchanged. Once you're switched to the Target Colors, the screen is completed.

Coily enters your life dropping onto the center-bottom of the screen from the top block. Luring Coily to its death is five hundred points.

Red Balls

These small crimson spheres will drop onto the board from either block two or three, just below the tip of the Pyramid from which Q*Bert begins the downward trek.

The Red Balls will drop haphazardly down the Pyramid, then fall off. They are, of course, lethal to our protagonist and should be avoided at all costs — even if it means ruining a perfectly-timed move.

Bugs

Ugg and Wrong-Way are purple "Bugs" that glide across the screen at very inopportune times. They are worth no points, which is no surprise: you can't go near them.

They first appear in screen three, level one. When Ugg and Wrong-Way sneak up on you — and we mean this literally, since they begin at the bottom corners of the Pyramid — any pattern on which you are working will be disrupted. However, these nasties will not follow Q*Bert as Coily does. If they come near you, freeze Q*Bert in place, out of their way, until it's safe.

Slick and Sam

These desperadoes are worth points if you capture them, ie jump onto the block on which they are standing. Don't ignore them unless Coily, Ugg, or Wrong-Way are on your tail.

While Slick and Sam are harmless to one of your Q*Bert lives, they are enemies because they change Target Colors which you have already made a different color.

Therefore, circumstances allowing, grab these two as quickly as possible. They will first appear on screen four of level one.

Freeze Ball

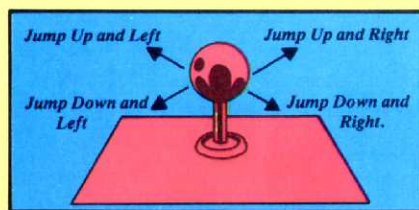
This tiny green "gumball" will drop from the sky and, hopefully, right into your lap — assuming your timing is straight-on. Like the lethal Red Balls, the green Freeze Ball plunks from top to bottom, coming out for the first time on screen three of level one.

Go for the Freeze Ball unless you spot something vicious and deadly plummeting your way. Getting this object is not worth sacrificing a life.

What the Freeze Ball will do for you, if captured, is stop all the action on the screen for several exhilarating moments, at the same time allowing Q*Bert to continue jumping the cubes including those on which there are Red Balls, Coily, Ugg, or Wrong-Way!

Use this time wisely, going after unchanged cubes or heading toward a Disc that can be jumped when the action starts — thus decoying Coily to its death.

Parker Brothers has acquired the rights to do a Q*Bert home videogame. Tentative plans call for a late summer or early fall release. Further details next issue.



Jumping Twice

As the screens progress, you'll find that Q*Bert must jump each cube more than once to hit the Target Color. For example, the Target Color may be tan, but when our ambitious hero jumps the cube may go from yellow to blue. You must leave the cube and jump back onto it. The next time Q*Bert does so, the blue will go tan.

On screens three and four of each level, Q*Bert will have to make three jumps on each cube to change it to its Target Color.

But beware!

Recall that Slick and Sam (though worth three hundred points if you nab them) will change a cube's color back as they jump down the Pyramid. That means you have to go back and patch things up.

Patterns

These are the most successful patterns you can use.

The first, Diagram A, applies to screens one, two, and four. The second, Diagram B, applies to screen three.

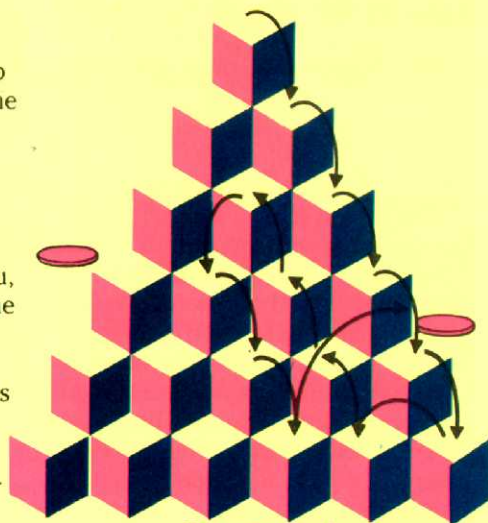


Diagram A

Then ... reverse the pattern and travel down the other side.

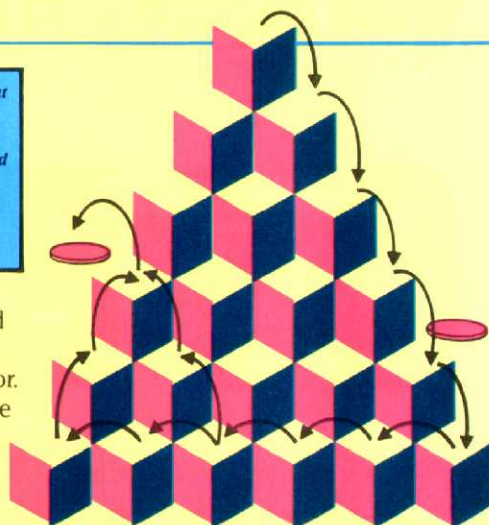


Diagram B

Part One: Come down either side and jump across the bottom. At point C, you will most likely have to move up to board a Disc and lure Coily to certain doom (as shown). At any Point D, wait for Ugg and/or Wrong-Way to bypass you.

Part Two: Return trip, back the way you came, to change to Target Colors. If you want to wait for Coily, change cubes in your area so that you'll be close to a Disc when the serpent arrives.

On the fourth screen of any level, pause toward the top center, toward the right or left — usually right — and you will be able to capture Slick or Sam. On the third screen, pausing at this point will allow you to nab the Freeze Ball.

Additional Strategies

Don't panic when Coily is springing toward Q*Bert. Even if there are no Discs left, a screen can still be completed and the killer defeated in that way. Remember, Coily is just a follower.

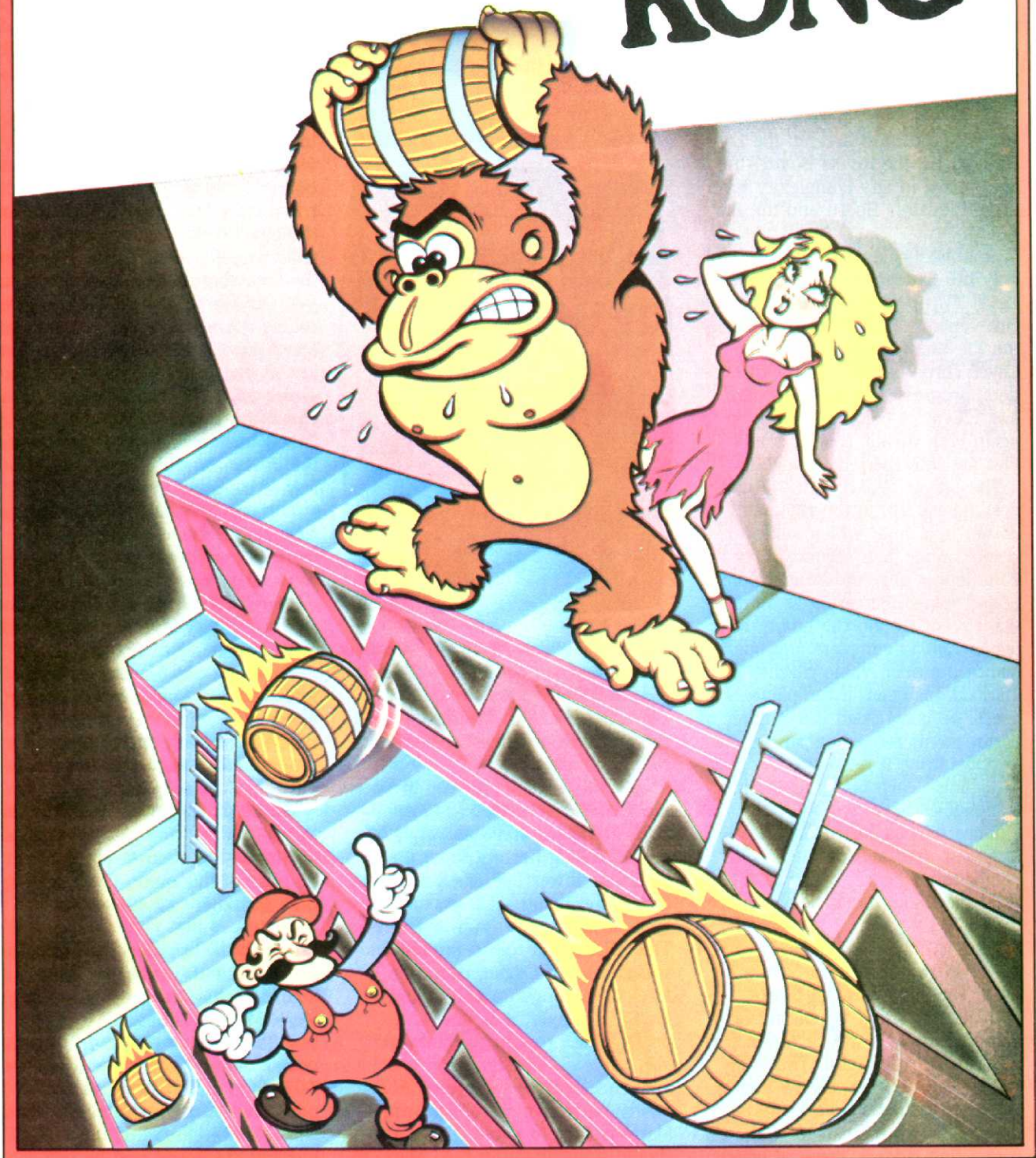
Remember, too, that you get no additional points for re-changing cubes tampered-with by Slick and Sam.

Although there are strategic patterns to follow, you may find yourself abandoning them when Sam and Slick come bouncing down the board. Go after them *only* if you can capture them in one jump. Otherwise, your tendency to follow them for capture will upset the Target Colors you have already attained.



conquering!

DONKEY KONG



In theory, *Donkey Kong* should not be a frustrating game to play. It has only two controls—a four-directional joystick and a Jump button—and the premise is relatively simple: maneuver a character named Mario up and around various boards to reach a certain plateau and save the lovely Nell from Kong's clutches.

Yet *Donkey Kong* is usually quite frustrating, especially for beginners. Playing it successfully requires an elusive "third" control—a sense of timing.

Timing. Knowing *when* to move and *when* to jump is what separates good players from mediocre ones.

There are four different screens which Mario must ascend: the Ladders Board, the Rivets Board—the final board in any complexity level—the Elevators Board and the Pie Board.

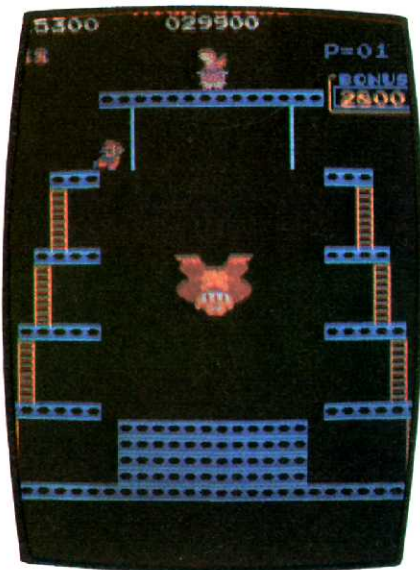
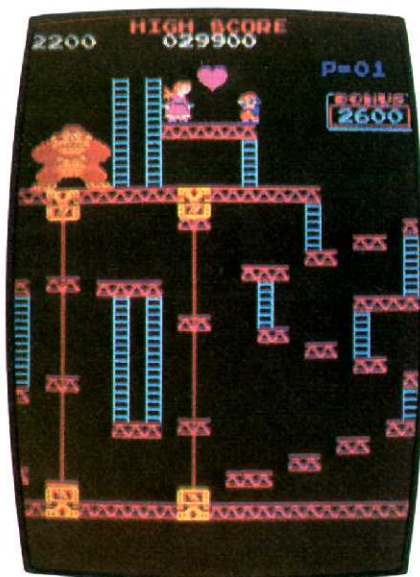
Complexity Level One consists of only the Ladders and Rivets Boards. Level Two begins with a more difficult version of Ladders, followed by the Elevators Board and Rivets; Level Three begins again with Ladders, progresses to the Pie Board and Elevators before finishing up again with Rivets. Elevators and Pies are interspersed throughout.

The player begins with the Ladders Board. In the top righthand corner is a timer which tallies points rather than seconds. Play commences at five thousand points, bonus points decreasing as Mario maneuvers around the board. If a player fails to complete any board before the point value reaches zero, Mario drops dead. If the player succeeds, he is awarded the number of bonus points remaining on the timer. Obviously, it behooves the player to finish each board as quickly as possible.

(More difficult boards in Complexity Levels Two and up begin with higher timer figures, from six-to-eight thousand, though never more than that.)

Time is only one of Mario's enemies. He can also perish if he's hit by or runs into a rolling Barrel, Fireball, Pie, Anvil, or Oilcan; or if he accidentally jumps or tumbles into a hole in the board. This is *always* a fault of the player's timing.

On the Ladders Board, Mario must climb from beam to beam via connecting ladders, some of which



Can you rescue Nell—and make a monkey out of Donkey Kong?

are broken, until he reaches the short beam on which the helpless Nell is standing.

As soon as gameplay commences, move Mario immediately to the right. Kong will have already started rolling Barrels down the beams to thwart Mario's ascent, the first Barrel being a Direct, thrown straight to the bottom of the screen. That Direct will roll to the left and smash into an Oilcan, causing a Fireball to dance up and follow Mario. However, it is slow and poses little threat to the stalwart player. Chalk it up to a touch of ambience, sort of *videogame noir*.

Any Barrel which rolls toward Mario is easy to avoid. The player should simultaneously hold Mario in

place—leave the joystick vertically neutral—and press Jump as the Barrel approaches. This simple maneuver earns one hundred points.

Sometimes Barrels come in twos or threes. Don't fret; let Mario run toward the Barrels, jumping at the appropriate time. This constitutes a Running Jump; Mario can make it over a Double Barrel and, if your timing is spot-on, over a Triple Barrel. The player receives three hundred points for jumping a Double, eight hundred for a Triple.

Whatever you do, don't make Mario flee oncoming Barrels. Either he'll be squashed while running or, if you initiate a Jump while he's heading away, Mario will land on top of a Barrel and suffer a spill.

Donkey Kong's Barrels not only bounce from girder to girder, but roll rapidly and unpredictably down the ladders. Although many machines have been "adjusted" so that the following trick no longer works, you can try to prevent Barrels from rolling down the rungs by moving Mario up a ladder and stopping him just as one of his hands grips the girder above. On an unadjusted machine, the Barrel will roll past; on a "fixed" machine, Barrels roll down the ladder, crushing Mario regardless of his position on the ladder.

The only effective strategy in a situation like this is to keep away from ladders if you see Barrels approaching from the beam above. If a Barrel *does* drop, you'll have time to press Jump, save Mario's life, and score one hundred points.

There are two Hammers which Mario uses to bust Barrels, scoring either three, five, or eight hundred points depending on the machine's programming. Hammers are plucked from the air by pressing Jump when Mario is beneath one. He can then move left or right, but he cannot move up or down a ladder. Because of this quirk, it's best to ignore Hammer One (the lower Hammer).

Due to the approaching Fireball, concentrate on getting up the beams to the one just below Kong's. Here, Mario will have to jump a few Barrels after which, as soon as possible, move him left to Hammer Two. Stop and wait for an approaching Barrel and jump it. Mario will score one hundred points for hurtling the Barrel *and* he will con-

nect with the Hammer. Continue moving to the right, halting at the point just beyond the ladder that connects to the gorilla's beam; then give the joystick a tap to the left so that Mario is facing it. Let Mario continue destroying Barrels.

As soon as the Hammer disappears, move Mario up the ladder to the next beam and go left. Jump Barrels until you reach the final ladder, then ascend. You're now ready for the Rivets Board.

Rivets is actually easier to complete than the second stage Ladders Board. Dancing Fireballs will pursue Mario around the screen, but they are easily outfoxed.

The object of this board is to cause the structure to collapse by removing the eight Rivets (also known as Bridges). Mario automatically removes Rivets by walking or jumping over them.

There are also objects—the girl's purse, an umbrella, etc.—scattered around the board. These earn the player points as Mario walks over them.

Once a Rivet is removed, a Fireball cannot roll over the gap. Mario can pass by making "running jumps," moving the joystick in the direction of a gap and pressing Jump just before he reaches it. If Mario is poised on the edge of a gap and the player jumps, our hero will only move up and down. As for jumping too early, that will send Mario plunging to his death.

By removing Rivets, Mario will trap the Fireballs in isolated spots. To make certain they are cornered, immediately move Mario to the right and grab points for running over Nell's purse. A Fireball will emerge from the left or right: after Mario has crossed the purse, move him to the ladder on the far right if the Fireball originates on the left. If it hops out from the right, pursue a mirror-image course to the left.

Upon completing the Rivets Board, the player will be faced with another more difficult Ladders Board. This begins Complexity Level Two. More Direct Barrels will be tossed by Kong; in fact, the very first will be thrown diagonally, crushing Mario on the spot if he reaches the first ladder without having paused somewhere along the bottom girder. The player must

wait, let the barrel hit the girder, then Jump as it rolls toward Mario.

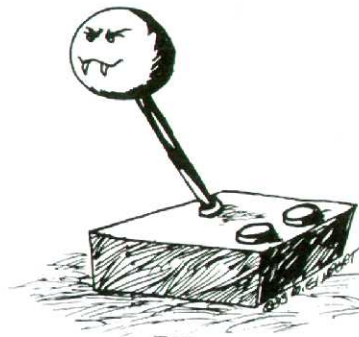
Although the Ladders Board gets progressively more difficult at higher levels, the best route to follow is the same one prescribed for the first Ladders screen. The player must obviously be more cautious, keeping an eye peeled for Directs, and adapting to the faster pace set by the machine.

The Elevator Board first appears as the second screen of Complexity Level Two. It is the most difficult board to conquer. There is really only *one* sensible path to the top. The route is simple; the tricky part is getting on and off the Elevators without killing Mario.

Mario begins his journey at a point close to the middle of the Elevator Board. As soon as an up elevator appears, the player must move Mario onto that elevator. He cannot be walked; he must be jumped while the player holds the joystick in the appropriate position (to the right at this point in the game).

Once the elevator has taken Mario to the level of the girl's umbrella (along the left side of the board), the player must get Mario off the elevator by holding the joystick left and pressing Jump. Don't simply hold the joystick without signaling for a jump, or Mario will walk right off the elevator to his death; nor should you allow the elevator to take Mario any *higher* than this point: if the fellow hits the top of his head on the rigid block into which the elevators disappear, he'll die.

Once Mario has walked over the umbrella, he must descend by way of the ladders directly beneath it. Once he reaches his original starting point, jump Mario onto another ascending elevator then again to the right, landing him on the dou-



ble-ladder structure. There he can retrieve the hat, earning more points. You'll notice that once Mario is on the doubleladder structure, the Fireball on the beam above will begin descending toward him. Waste no time moving Mario *up* the opposite ladder to the top of the beam. Walking to the right, jump onto the descending elevator as soon as possible. By this time the Fireball will realize its mistake and start climbing, but if you can get Mario onto a departing elevator quickly enough he'll be safe.

As Mario descends, jump right from the elevator, landing at the point where he began the Board. Climb the short ladder and jump right to the foot of the ladder hanging from the extreme right-hand side of Kong's girder. The falling anvils will be dropping just to the right of Mario. Don't worry about them *or* the purse at the extreme right hand side of the board; it's not worth the risk!

Ascend the ladder to Kong's level, and between anvils—watch out, they bounce!—rush to the left. Climb the last ladder and head for the girl.

The Pie Factor is next, and in this board the player should begin by moving Mario right, crossing the base to grab the purse, then backtracking to climb the second ladder from the left. Mario will find himself on a conveyor belt that periodically brings out Pies—which are, of course, lethal to Mario. Mario can jump the Pies, though it's best to avoid them when possible because they're so wide.

Ignore both Hammers on this board. The one under the Oilcan is difficult to grab (the conveyor belt will cause Mario to slip and slide) and wastes precious moments while the timer ticks points away. The other Hammer is simply useless, since Mario cannot climb while holding a Hammer.

Use the left ladder to go up, then move right, pick up the hat, and climb the next ladder. Mario will reach another conveyor belt which brings out yet more Pies. Worse, a Fireball will flare from the Oilcan to pursue poor Mario.

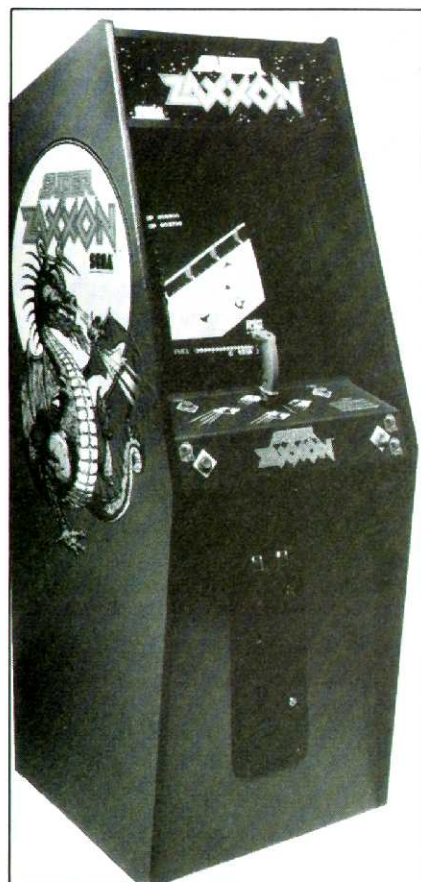
However, if the player is quick Mario can avoid the Fireball *and* any pies. Move him right, jumping

Continued on page 55

ZAXXON

How to survive the most realistic space game of them all.

By Randy Palmer



State-of-the-art computer technology provides videogamers with new, vivid graphics in *Zaxxon*, the incredible 3D space game.

The player's ship is seen from a vantage point slightly to one side and above the craft itself. Using only an outsized joystick—which is

equipped with a missile-firing trigger that we suggest you ignore (see below), the player must attempt to maneuver the ship up, down, left, right, across, and through an enemy landscape. This is not your harsh but tame Apollo VIII vista, but one brimming with futuristic cannons, aircraft, and stone walls topped by electrical force fields. Surviving that, the player must soar through space itself, where any aircraft not destroyed at ground level will pursue your ship. Then it's back to the airstrip where battle commences against a giant robot.

The joystick moves the pilot's ship left and right as well as up and down. To ascend, pull back; to descend, push forward. It's best to think of the joystick as gliding in "arcs" rather than in two-dimensional movements, since you're playing in a spatial setting. The quicker you realize that your *Zaxxon* ship is flying rather than simply dodging, the better you'll do.

Assume that the joystick describes a circle. The top half or "forward arc" is used to move the ship left and right close to the ground, while the "rear arc" shifts you from side to side high in the air. Leaving the stick in a central position will fly you at a constant, medium altitude.

Always remember that the joystick in this videogame requires a light, deft touch—not sudden and jerky movements such as those useful in *Pac-Man* and similar joystick

games.

The trigger on the stick can be used to fire missiles. However, it is best to ignore it and use, instead, the left or right "fire buttons" on the control panel. They perform the same function but can be pressed at a faster rate. Obviously, it's better to have more rather than fewer projectiles headed the enemy's way!

Flight in *Zaxxon* can be gauged by three factors:

1. The altimeter on the extreme left of the videoscreen. This isn't much help because you should be too busy following the action to glance over.

2. The shadow your ship throws on the terrain of the enemy fortress. This shrinks as you rise, an accurate indicator of how high or low you're flying. Obviously, the shadow is useless while you're jetting through space.

3. Using your missiles as yardsticks. They're being fired straight ahead: where they strike tells you your altitude exactly.

Remaining in flight is slightly more difficult than determining your height.

One everpresent problem is fuel. You run out of it rather quickly, and the only way to replenish it is by raiding the storage tanks of your opponent. Do this by blasting the large red containers—taking care not to collide with them. Though these are sizeable targets, they are low to the ground and the ship will

have to fly in quite low over the Fortress. An even greater danger is getting caught in the blast; make certain you pull up before the concussion hits.

Blasting a half-dozen fuel drums will ensure enough energy to propel your ship through the relatively brief jaunt into space. Should you begin to run short, the computer will sound a warning; assuming that you survive the battle, make the oil depots your first targets upon reencountering the flying Fortress. But—we get ahead of ourselves.

Zaxxon begins by sending your ship toward the enemy Fortress. A few orientational taps on the fire button will show you exactly where the ship is headed. If the missiles explode on the wall, move the joystick so that they pass through the gap. This will ensure that you do the same.

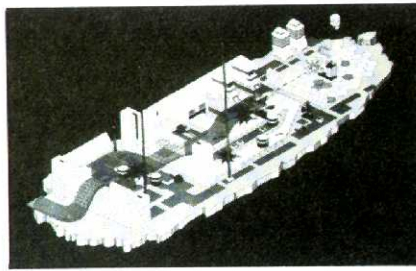
Watching your shadow, descend immediately after you clear the wall and start firing by tapping the button repeatedly. (Holding it down will get off only one shot; there's no "rapid fire" mode in *Zaxxon*.)

The green Turrets pointing across the Fortress won't fire during round one, although they will have a go at you in succeeding rounds.

Shoot continuously while you navigate. It's advantageous to do away with as many enemy aircraft as possible, since the number destroyed means that many *less* you'll have to confront during the space battle stage of the game. You will increase your score for each ship downed as well. Only when you get the hang of the game should you defer shooting at enemy Shuttles for the high-point but non-lethal radar towers.

Zaxxon's manufacturer, Sega/Gremlin, suggests in their "Combat Ace" cards which are distributed to arcade operators that it isn't a good idea to fly at a constant level. This simply isn't so in the Fortress screen. The only benefit to be derived is from flying low, when your enemy won't fire Homing Missiles your way. But there are collisions to even the score. In all, constantly ascending and diving or swerving is your best tack.

There are, of course, times when you *must* alter your pattern. Laser fields must be flown over, as well as Missiles taking off from their



silos. You should try to destroy these, but if you can't you must evade them. Care should be taken to avoid the fire spewing from the rockets' tails as they launch, since the player's ship can be scorched.

Since the player cannot control the ship's forward speed, the vessel will automatically reach the end of the Fortress before long. At this point, you will encounter the final wall and soar into space. Enemy aircraft will begin their attack while an occasional fuel tank satellite will zoom past. If you're well-stocked, avoid these: best to concentrate on the Shuttles. If you're low on fuel, strike the fuel tanks by positioning your craft at its highest level.

As in the Fortress mode, fire constantly during the space duel, moving out of the way if an enemy aircraft gets the jump and draws a bead on your ship. *Zaxxon* will warn the player when this situation has arisen: a "beep" sounds and a small "x" flashes on at the nose of your ship. Shoot if you have the chance, but if there's *any* doubt get out of the way. Otherwise, *here* you can fly at a constant level, waiting for attacking Shuttles to reach your level and blowing them out of the skies when they take the bait. The second Fortress you approach will throw up several new laser barriers to block your flight path. These cannot be flown over. Instead, you must fly through the empty space between the wall and the force field. To accomplish this, fire missiles at the barrier to ascertain your height, then fire until they pass through the gap. Hold your joystick steady at this level.

After passing through the laser impasse, there will be several targets at which to fire. However, almost immediately a second laser field will force you to reposition your ship to pass through *its* gap. Until you've gotten very good, don't bother with the targets: concentrate on the wall, or you'll lose your ship.

After successfully negotiating a third laser barrier on the second Fortress, your ship will suddenly stop. The *Zaxxon* robot will approach, a monstrous machine with the uncanny ability to move from your line of fire.

You will be able to move as before with every advantage save forward motion. Do so as you try to strike *not* the robot but its guided missile. Six direct hits are required to neutralize the missile. Fire continuously as soon as the robot appears, even before the projectile leaves its hulking form. When you score a hit, the robot will jitter and flash red. Keep plowing it with fire no matter what histrionics ensue.

Unless you are extremely lucky—or extremely sharp—the guided missile will leave the robot's metallic hide to seek you out. Luckily, the missile is slow, which allows you to hit at it; but because the missile can evade your fire, it'll take quite a bit of hand-eye coordination to tag it in flight. *Hold your ground rather than try to dodge the missile!* Your chances of striking it are better than your chances of avoiding it.

If you manage to neutralize the missile, it will turn green. If you don't, your ship will turn red and fly into a glittering rain of debris.

Once the player has managed to destroy the missile, *Zaxxon* moves on to the next difficulty level. It returns you to the first Fortress, with the exception that the Interceptor Missiles lift off more quickly, the Turrets are now active, and the enemy Shuttles will fire at you even before lifting off from the Fortress.

As if this were not trying enough, the space through which your ship can safely pass the laser barriers becomes progressively smaller, and fuel is consumed at a faster rate.

In short: always keep shooting, always be prepared to dodge, and always keep enough quarters on hand in case all else fails.

Zaxxon scoring

Enemy Shuttle on runway: 50 pts.
Enemy Shuttle in space: 50 pts.
Interceptor Missile: 150 pts.
Gun Emplacement: 200 or 500 pts.
Homing Missile: 200 pts.
Fuel Tank: 300 points.
All Shuttles destroyed: 1000 pts.
Radar Tower: 1000 pts.
Robot: 1000 pts.

PITFALL

Help Harry hurtle his heroic heart out!

Object

Pitfall Harry is an adventurer without peer. He's also an adventurer who doesn't know the meaning of the word exhaustion. If you're game, he will run, leap, and swing through 256 different screens in search of danger and, of course, treasure—the Lost Treasure of Enarc!

Variations

There is only the one game, a continuing quest from screen to screen.

(Note: you can create your own variations by playing *Pitfall* backwards; that is, begin by going left rather than right. This, of course, is cheating, but it will satisfy two needs. First, just in case you don't get that far on your own, you will get to see the screens which are 256th, 255th, 254th, etc. Second, if you're finding it difficult to get over, say, the alligators, should you fall in this version you get a new Harry on the *other* side of the swamp.)

Scoring

Harry begins his trek with 2,000 points. His tally changes swiftly once you engage the game.

The only way to win points is to snatch up treasure as you find it. This takes various forms, and accounts for different point values. For example, the diamond ring earns you 5,000 points, the bag of money 2,000, the gold ring 5,000, the bar of silver 3,000, the bar of gold bullion 3,000, and so forth.

Jumping is a matter of timing and a light touch. Don't press down on the action button and, that done, push the joystick. This will give you a lumbering, doomed Harry.

There are plenty of ways to lose points, however. Every time you are struck by a rolling log you surrender twenty-two points *maximum*. If you jump a log—rolling or otherwise—and nick it on the way down, you lose only a handful of your total.

Falling into a pit costs you 100

points. Ironically, killing one of your three Harrys does not cost you any points.

While all of the point-scoring is being totalled by the computer, it is also keeping track of your time. The game ends after twenty minutes, though it will keep on going if you're down to zero points. The object, naturally, is to make the best time with the greatest score.

Control

Harry is maneuvered with the joystick. The action button causes him to jump; when pressed in conjunction with the stick being moved in any direction, Harry will jump in that direction. When only the stick is shifted, Harry runs either left or right.

Patterns

The treasure is always located on the right of the screen, and new Harrys replace dead ones by dropping from the trees on the left side of the screen.

Strategies

The best way to win *Pitfall* is by learning to jump. If you can master that, everything else is secondary.

If you can jump the logs, you won't lose points there.

If you can jump the alligators with precision, from head-to-head, you'll lose no Harrys in the swamp.

If you can jump the pits, you won't find yourself facing the scorpions which lurk in the subterranean passageways (unless you *choose* to go down there; see below).

If you can jump to the vines which dangle over the water, quicksand, earthquakes, and other disasters, you won't fall short of the rope and perish.

If you can jump the campfires, cobras, and scorpions, you won't be burned, bitten, or stung to death.

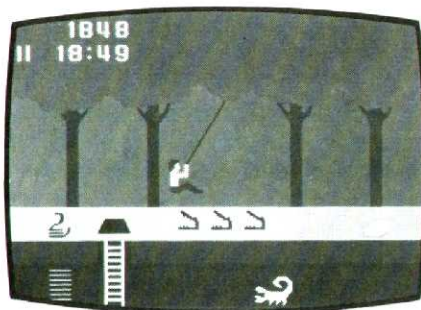
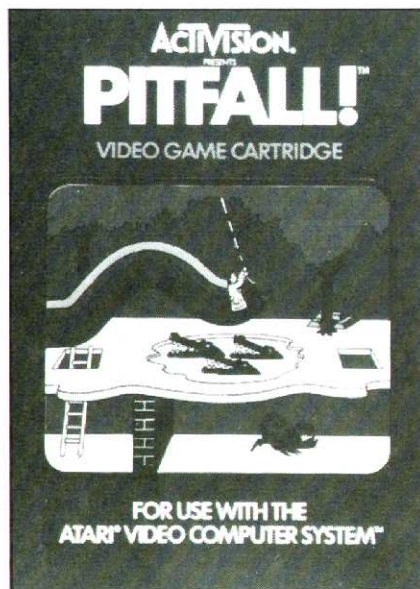
Jumping is a matter of timing and a light touch. Don't *press* down on the action button and, that done, *push* the joystick. This will give you a lumbering, doomed Harry. Rather, flick your wrist so that the joystick is jerked over, at the same time jabbing the action button with your thumb, and then releasing.

As for specifics of play, here are some valuable pointers:

1. If, when you enter a screen, the ground is free of obstacles save for a log or two, *stop!* It will split momentarily. Wait until it closes before you dash across. Further, it's a good idea always to leap the last leg of your crossing, so that you'll be in the air should the earth crack beneath you.

2. The alligators' mouths stay open for 2.1 seconds, and shut for just as long. As it will take you a fraction of a second to leap from the swampbank to the first alligator, do so after the mouth has been open for nearly the full time. By the time you land, it will have shut. This gives you more time to cross. In any case, make it a practice to land on the head rather than mouth of the animals, since that part is always solid. If the mouth opens when you're on the alligator, it's so long Harry.

3. In most cases, whenever there's an option to travel by vine or run across a vista, use the former. It's quicker and safer. If you miss the vine, you can always step back and



Activision's Pitfall—hard to avoid.

wait for it to return. Having said that, if the earth is just closing up and the vine is on the opposite side of the screen, make a run for it rather than wait. Remember, you're also racing the clock!

4. Speaking of waiting for the vine, don't leap haphazardly at a tendril which is starting to swing away from you. Chances are you won't catch it but will plummet into the quicksand, crevasse, etc.

5. The logs come in ones, twos, or threes. The single logs are easiest to jump, as you can keep running while you do so. If you try to take the trios at a run, you'll stumble over the second and probably the third. Best to stop and hop them. The doubles can be taken in one mighty leap. Needless to say, after completing one wave of logs, anticipate the one which follows. In any given screen, the number of logs will always be the same. Note

that a new Harry fallen from the trees is immediately vulnerable to rolling logs.

6. If you're jumping a pit *and* logs at the same time, jump the trios before taking the pit, as you'll find it virtually impossible to negotiate four impasses; with doubles, wait until the center of the logs is over the midpoint of the pit and you'll clear both; with singles, take them as they arrive.

7. Whatever you do, try not to be knocked over by a log while crossing a vanishing obstacle. By the time you rise, the fissure or marsh will usually have returned, swallowing you up. The logs are not affected by any obstacle.

Playing the overground is a matter of timing. Playing the underground is a question of nerve. For one thing, the scorpions are difficult to leap. Their coiled stingers make them a tall target. Best to jump as close to the arachnids as possible, even later than your instincts dictate.

You will lose one hundred points for descending to the underground, but there is often a good reason to do so: you can *save* a good deal of time. For each underground screen you negotiate, that's *three* above-ground panels you don't have to cross. One drawback, apart from the scorpions, is if you encounter a brick wall between tunnels. At these blockades, you have no option but to turn around. Otherwise, go as far as you want until there's a ladder to descend.

Another negative aspect of subterranean travel is that if there's treasure above, you won't be able to get it except by using the next available ladder and backtracking. Not terribly efficient. In all: stay on rather than in the earth.

Comment

This Activision game is full of surprises. Not only has it packed a staggering amount of danger and therefore player-challenge into an Atari-compatible format, but it offers several *pleasant* surprises—such as Harry's Tarzanlike yell as he swings on his vine.

ROBOTRON

*The survival of humankind
depends upon how far you can stretch your quarter.*

By Randy Palmer

When Williams Electronics first unveiled *Robotron*, it did so with a press release which made the following announcement:

"It has all come down to this. The last chance for civilization as we know it. The last gasp of humanity. We have gone too far. There is no way back.

"Our technological sophistication and quest for a better world has led us to perfect the ultimate robot. A species of robot that can think and act for itself. A species that no longer needs its creator. The robots have organized and revolted. They have turned against their masters, their makers, and the whole human race is threatened. Their mission is simple: to reprogram the remaining few hundred humans into their own image or, failing this, to wipe any trace of humanity from the face of the earth.

"You alone, through a malfunction in genetic engineering, cannot be reprogrammed into one of them. You alone have the unique powers of the optic shield to prevent the final destruction of mankind."

The year is 2084, and a science fiction nightmare is truly upon us!

The player, represented by a Supermanoid, must protect survivors

in the image of Mommy, Daddy, and Mikey. This is done by firing lethal bullets in eight directions via manipulation of the game's right-hand joystick, and by moving in those same eight directions using the left-hand joystick.

These are the only two controls at the player's disposal, though complete and competent control ensures total maneuverability. Players must get used to shooting on the run, especially firing in the direction from which you are fleeing. With practice, escape from and simultaneous fire at Robots becomes second nature.

Unlike in *Berserk* or other games of its hit-and-run ilk, the player's figure doesn't have to stop moving to shoot. Nor does it have to physically point in the direction it wants to fire. The player handles this simply by shifting the joystick.

Five different Robots populate the game: Grunts, Indestructible Hulks, Enforcers, Brains, and Tanks. There are also Electrodes, small geometrical blocks which must be circled or shot; when a Supermanoid bumps an Electrode, both vaporize. Electrodes become more numerous in succeeding waves.

There are also Spheroids and Cuboids, deadly breeders of the En-

forcers and Tanks; there are Cruise Missiles dispatched by the Brains; and finally there are Progs, humans which have been dehumanized by Brains.

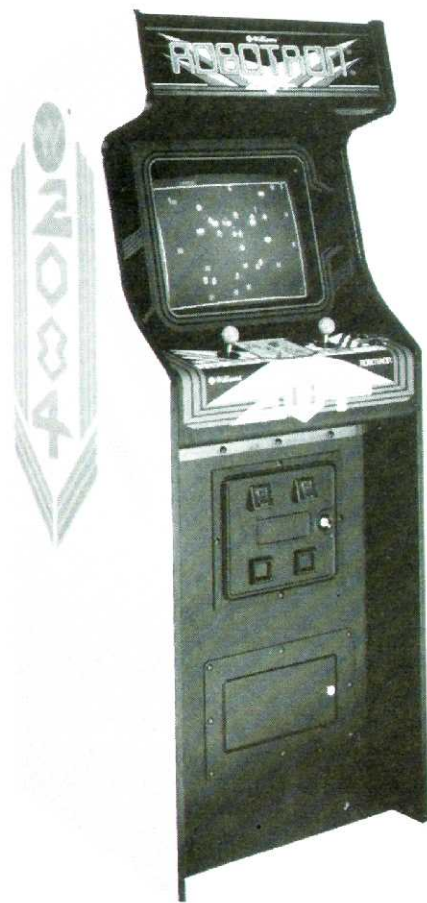
Points are awarded as follows:

Sparks: 25 points
Tank Shell: 50 points
Cruise Missile: 75 points
Prog: 100 points
Grunt: 100 points
Enforcer: 200 points
Tank: 300 points
Brain: 500 points
Spheroid: 1,000 points
Cuboid: 1,000 points

An extra Supermanoid is awarded to the player for each twenty or twenty-five thousand points tallied during play, depending upon how the operator has set the game.

Although there are only three humans identified to the player, many more will appear onscreen after Wave Three. The player saves humans simply by walking across them.

For the first human saved, the player is awarded 1,000 points. The second salvation is worth 2,000 points and so on to a maximum of 5,000 points for the fifth and all subsequent rescues.



emerge from the aftermath of a colorful implosion of lines and sparks. Regardless of the wave, the Supermanoid will always accrete in the center of the screen.

The basic strategy to pursue for the early waves (One through Five) is to keep moving away from clusters of enemies while shooting toward them. In later waves (Six and up) it's usually better to stand still, fire into the crowd of Robots to clear a path, *then* move. This is especially true when Cuboids and Tanks appear in Wave Seven.

The least threatening villains in the game are the Grunts. They have no weapons of their own, but the immensity of their force—which increases with each succeeding wave—is something which causes even *Robotron* masters to quiver.

Grunts waste no time pursuing the player's Supermanoid up, down, and around the screen. Their mission is, of course, to dispose of you as quickly and efficiently as possible which they do simply by walking into you. However, they are easily deactivated by a lone blast from your Anti-Robot Laser Gun. Of course, while it only takes one shot, the sheer number of Grunts which inhabit the world of *Robotron* forces you to fire rapidly, in many directions and without pause.

Grunts are also annihilated by Electrodes.

Avoid getting trapped in the corners. Surrounding hordes of Grunts will move in; the closer they come, the less time you will have to reposition and fire.

Since Grunts are the least menacing of the Robots, get rid of other foes first unless you are on the verge of being corner-trapped or overwhelmed. In any case, remember to allow at least one Grunt to remain alive whenever there are humans left in a wave. Letting the Robot live will give you to opportunity to pick up points for saving humans.

Occasionally the player will have to sacrifice such points; for example, if most of the Grunts have been destroyed but Enforcers are being bred by Spheroids at an alarming rate. Supermanoid survival is best served by sacrificing remaining humans and leaving the wave behind.

The Hulk Robots are slightly more intimidating than the Grunts.

They are slow but don't vanish or explode when they're shot; as advertised, they're "indestructible." Your laser bullets will merely move them back a step.

Since Hulks are constantly, mindlessly walking forward, hitting these Robots repeatedly will simply cause them to stay in the same place. Although there are no points awarded for holding a Hulk at bay, doing so prevents them from destroying humans, which they do by crossing their path—a skull-and-crossbones appearing where the mortals perished.

To save a human from an approaching Hulk, face the enemy head-on, deterring it with rapid fire while you move in to snatch up the person.

The Enforcers are considerably more dangerous. They are bred at an alarming rate by floating, pulsating Spheroids (see below), heading directly for the Supermanoid and emitting showers of "pinwheel bombs." These discharges can be destroyed by a laser bullet, though they bestow no points and are quite difficult to hit.

Enforcers are swift and crafty creatures, and though they are vulnerable to your laser fire a half-dozen may appear at one time. Thus, it's sometimes impossible to put them all away. In addition, the Hulks have a tendency to get in front of Enforcers, thereby protecting them from your bullets. Best to maintain your fire against the Hulks and, when an Enforcer tries to get around, plug it. Needless to say, the nagging pinwheel bombs pass right through the Hulks, other Robots, and Electrodes.

Many times an Enforcer will sneak away from the main group, speeding to the side or corner of the screen to hide, hoping that in the heat of combat the player will forget about it. Then, when the player has destroyed the Enforcers in the main group, the corner dweller will hurl a pinwheel. Keep the beggars together by picking off strays at once.

The best way to avoid dealing with Enforcers at all is to destroy the holes from which they climb—that is, the Spheroids. The pulsating, fiery-orange nemeses appear at the beginning of a wave, materializing anywhere on the screen and rapidly

Each new wave or the loss of one of your Supermanoids returns the award for rescuing humans to 1,000, from which you must work back up to 5,000.

If you accidentally shoot a human when aiming at a Robot, don't worry: the laser bullet will pass through your unintended victim without harming him. Hopefully, it will press on and destroy the Robot.

Many times you'll find humans walking alongside the walls of the screen. Don't worry about walking into a wall when you try to rescue them or dodge an adversary: the walls are among the few things in *Robotron 2084* which aren't electrified.

If you watch closely when each wave begins, you can spot where your humans are about to locate. Each individual figure on the screen materializes rather than just "popping on."

Humans appear a split-second before the Robots; if you've a sharp eye, you'll be able to note the direction in which to move before combat commences.

Immediately after the Robots appear, the player's Supermanoid will

floating to the corners. If you can blast them as they go by, so much the better. But watch out: they travel perilously close to the center of the screen, where your Supermanoid will be perched at the beginning of each wave.

The player should move at once in a direction which will allow the saving of as many humans as quickly as possible. That tack gets you out of the center and keeps victims from the Robots; it should be abandoned the instant the Spheroids appear. Dispatch them as quickly as possible, before they can generate many Enforcers. It takes two, sometimes three shots to do in a Spheroid.

Never leave Spheroids until last. If you do, they are sure to *outlast* you!

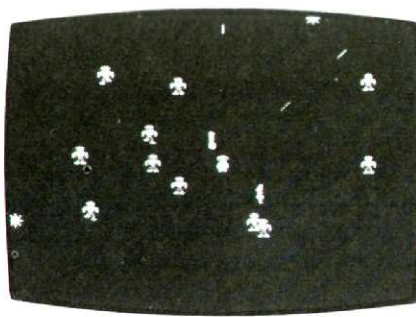
In Wave Five and multiples thereof, the hideous Brains make their presence known. In each Brain Wave there are no Hulks but more humans to save, thus helping the player to gather points. On the other hand, Brains can turn humans into deadly Progs (more on those poor souls later) unless the player's Supermanoid manages to save them all. That's extremely difficult for pros, let alone novices, since the humans will be spread all over the screen. Nonetheless, you should give it a go; here's how.

Fire at Brains as you move around picking up humans. There will be a sprinkling of Grunts and Spheroids/Enforcers to deal with, and you should blast them as possible.

Brains emit Cruise Missiles to track the player's movements. These worm-like energy beams sling and slide all over the place and will strike your Supermanoid without warning. Make it a practice of moving and avoiding them if higher-point targets are available; if not, wipe them from sight. If there are several in your vicinity, destroying them obviously takes top priority.

The Brains themselves attack humans, turning them into ghost-like Progs. Progs travel in vertical and horizontal paths and, like the Cruise Missiles, don't automatically head for the Supermanoid. Instead, they move around the screen in various obstructive patterns.

Progs and Brains are both easily dispatched with a laser blast.



Again, try to gun down the Spheroids early during Brain Waves, before you are forced to deal with a newly-hatched batch of Enforcers.

With the start of Wave Seven, *Robotron* introduces a new enemy, the formidable Tanks. These are offspring of the fast-moving, difficult-to-see Cuboids. Tanks are to Cuboids what Enforcers are to Spheroids. Because Tanks are pumped from Cuboids much faster than Enforcers from Spheroids, it's important to obliterate as many Cuboids as possible and as quickly as possible. What's difficult about bringing this off, however, is that the Cuboids shrink and lose luminance as they move about the screen. Obviously, hitting them can become an exercise in futility.

It's best, therefore, to shoot in all eight directions at once. The odds are you'll hit a goodly amount. This strategy actually works better than aiming, since you can get the shots off more quickly and strike the objects before they dwindle. Naturally, the fewer Cuboids there are, the fewer Tanks will burst forth upon the screen—and upon you.

Shoot as accurately as possible as long as you do so as swiftly as possible.

Once the Cuboids have been vanquished or escaped, you are besieged by an army of Tanks. These are capable of "blowing their stacks" with lethal "popcorn bombs" called Sparks. These bombs bounce off the border of the screen, moving faster each time they bounce. Although the bombs can be destroyed by a laser bullet, chances are good that one of them will "pop" your Supermanoid. Since you can't dodge the bombs forever, nor shoot them all unless you've the experience of a Han Solo, dispatching the Tanks themselves is the only answer.

Tanks are large, move slowly, and are easy targets. However,

Hulks tend to group around them, displacing your shots. Moving in a semi-circle will draw the Hulks and allow you to dart to the resultant opening for a clear shot at a Tank—though players must simultaneously avoid the popcorn bombs, which may force you to move before you can shoot through an opening.

Don't stand your ground at the expense of a Supermanoid; you'll get another shot at the Tank, but to do so you must survive!

Following the Tanks, *Robotron* gives the players a brief respite. Wave Eight is "just" Grunts, Hulks, Spheroids and Enforcers.

With Wave Nine, the border of the screen vanishes, and the field is literally packed with Grunts. The player has more room to move with the border gone, but the Grunts can just as easily corner you since there are more of them than before.

In these waves, use the same plans outlined above. Don't worry about picking up the humans in Wave Nine and onward. They're there of course, but your concentration must be on survival.

Make a "hole" in the Grunt pack, step into it, and shoot your way to the side of the screen. Once there, push the right (firepower) joystick toward the opposite side as you move the Supermanoid up and down. This maneuver will rid the place of Grunts and give you more room to move. When you can do so, drop to the bottom of the screen, firing upward. You'll be able to blast at a wider area, will have a barrier protecting your back, and will have more room in which to maneuver.

Reaching Wave Ten, the player will have survived to the year 2084. You'll know this by the "signposts" plastered all over the screen. Be wary of these; they're disguised Electrodes and must be shot away.

You are welcomed to 2084 by another Brain wave, chock full of everything except Tanks. Dozens of humans, mostly Daddies, litter this wave, and many are foredoomed to be transformed into Progs. It is, of course, up to the player how many will be saved by risking Supermanoids: by now, the Brains are sending out Cruise Missiles faster than ever.

Again, if you can clear a path to a human, go for the points. More important, however, is staying alive.

Robotron does not end here, but moves onward to Wave Eleven, Twelve, and so forth. You'll have to play for some time before you see these later levels. However, chances are you'll have the skills down pat by the time our robots really do revolt. □

DONKEY KONG

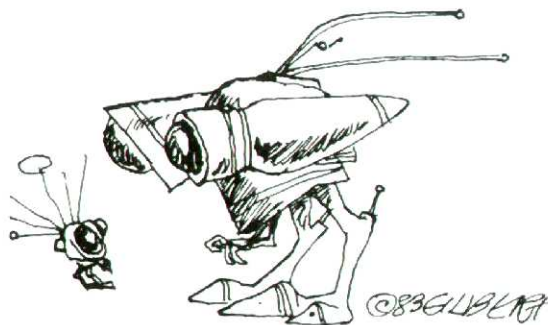
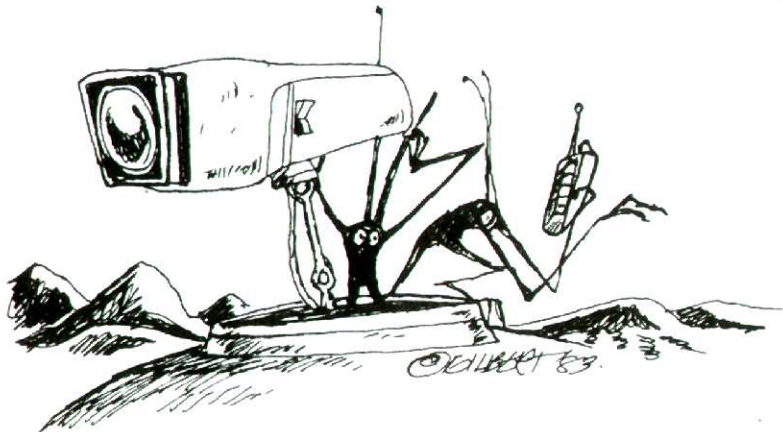
Continued from page 47

Pies and, as soon as possible, let Mario get a grip on the topmost ladder on the left. Climb it to avoid any additional Pies.

Once Mario reaches the gorilla's level—not that of Nell, who is higher—the board is completed. But beware: the final ladders on both sides

periodically disconnect from the ape's beam. Don't move Mario until the ladder reconnects, which it will do after a few moments.

These are the moves to make on each of the boards. Use the same moves on the later versions, even though their speeds make them progressively more difficult. Above all, don't become frustrated! Remember, Nell is counting on you. □



meet the original... ZAXXON

The alien entrenchments loom ahead, you dive your ship toward them. Blasting away, you destroy ships and missiles, performing an Immelmann to avoid return fire.

You could be playing *Zaxxon* or, on the home front, Intellivision's *Star Strike* or *Astrocade's Star Battle*.

Or you could be watching your videotape of the climactic assault on the Death Star from *Star Wars*.

Or you could be enjoying any number of science fiction tales which use awesome, rootless extraterrestrial bases as a prop.

Unlike the theme of gorillas vs. women, surveyed in our last issue's *Meet the Original ... Donkey Kong*, the notion of interstellar or floating cities does not appear much before this century. Mythology offered the Greek Olympus, poised atop a cloud-piercing mountain, and the Norse Asgard, the city of the gods floating on Hvergelmir, a celestial spring running from Niflheim, the land of mist.

In Jonathan Swift's satiric 1726 masterpiece *Gulliver's Travels*, our hero encounters the flying island of Laputa, on which a city has been raised. The isle

is guided by its denizens, who block the sunlight from and hurl projectiles at earthbound villages until tribute is tendered.

The first bonafide city-fortress in space was put there in 1869 by Edward Everett Hale in *The Brick Moon*. The author/clergyman — best known for his classic *The Man Without a Country* — told of a city prematurely hurled into space, bearing the builders and their families nine thousand miles from the earth where they live ever after.

Cities have been situated on other worlds, a popular theme in turn-of-the-century science fiction novels. Readers found them rooted to the Moon in H.G. Wells' *First Men in the Moon* and Edgar Rice Burroughs' *A Princess of Mars*, among many other works. However, cities hovering or drifting through space really came into their own with the boom in science fiction prose precipitated by the appearance of *Amazing Stories* in 1926. The success of that magazine spawned countless other SF publications, most of which featured spacefaring cities at some time or other.

Most prominent were Edmond

Hamilton's *Cities in the Air*; James Blish's epic *Cities in Flight*, in which antigravity devices known as "spindizzies" lift cities like New York into space — where, remarkably, the inhabitants look for employment among the stars; Clifford D. Simak's *Limiting Factor*, about a giant metal world in space; Larry Niven's novels about Ringworld, an awesome wheel-like settlement orbiting a distant sun; and Arthur C. Clarke's *Rendezvous with Rama*, wherein a world-sized city pays us a visit from a distant solar system.

Comic strips and comic books have likewise featured space cities, the most famous of which is the sky-settlement of King Vultan in the comic strip and motion picture versions of Alex Raymond's *Flash Gordon*.

With the success of our nation's space shuttle, and with Russian activity in space moving toward permanent settlements, it is only a matter of time before there are *Zaxxon*-like fortresses in earth orbit and sailing starward. Let's learn from the dire vision of Swift, Raymond, et al and work to ensure that the similarity between life and videogames ends there ... !

meet the original...

DONKEY KONG

The arcade ape comes from a long line of monkeys who can't keep their hands to themselves.

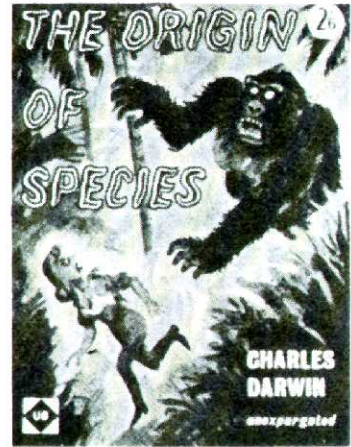
Darwin would have argued that while there are simians in our ancestry, modern-day chimps, capuchins, macaques and their ilk have no interest in humans. Who can blame them? Apart from biological incompatibility, our species are social opposites. According to ecologist Peter Veit of the American Museum of Natural History, even the mighty gorilla is a "gentle animal who roams the rain forest in peace and tranquility."

Ah, but ask videogamers about gorillas and you'll get a *different* tale. The shaggy brutes are anything *but* gentle. They don't hesitate to snatch up defenseless women, make a shambles of our proudest buildings, and pitch flam-

ing debris at anyone who tries to stop them.

Yes, *Donkey Kong* proves that there is a darker side to monkeydom than scientists have suspected. However, the world's most popular arcade game — now a Coleco home game — is not the first hint we've had of simian malevolence.

Hindustan, the world's oldest living religion, tells the ancient tale of Hanuman, the monkey general. When the wife of the demigod Rama is kidnapped, the warrior ape marches on the city where she is held. His tail is set ablaze with oily rags and — shades of *Donkey Kong* — he scoops up the woman, setting fires in his wake to



Britain's humor magazine, Punch, had fun with Darwin in this issue.

thwart pursuit.

Scheherazade tells us of "The King's Daughter and the Ape" in *The Arabian Nights Entertainment*, but that little escapade is not entirely the fault of the titular baboon: "It chanced that a great ape passed under the lattice of the princess, so she unveiled her face and signed to him with her eyes, whereupon he climbed up and night and day abode there, eating and drinking. Her father heard this and would have killed her had she not fled to Cairo with the ape." There, a butcher loyal to the king follows the princess to her palace where he uses his knife to disembowel the baboon.

Eleventh century Europe produced a folktale in which the wife of Count Gulielmus of Liguria falls in love with a monkey. The feeling is mutual and, in a jealous tantrum, the ape slays his rival. Records show that the aggressive ape theme surfaced again in 1589 in a play about Divinity who, personified as a woman, is abducted and ravaged by a gorilla, representing Hell.

A better-known incident occurred in Voltaire's *Candide*, published in 1759. Lost in the jungles of the Amazon, *Candide* stumbles upon two women be-



An evocative sketch from the pages of Weird Tales, a fantasy publication which flourished in the 1930s.

ing pursued by apes. Grabbing his musket, our hero plugs the monkeys.

Tales such as these turned many goodhearted souls against apedom, including no less a personage than one of our nation's founders. In *Notes on Virginia* Thomas Jefferson observed "the Oran-utan prefers (human) women over those of his own species." Artists such as Fremiet and Picasso didn't improve simian public relations with their myth-perpetrating "Gorilla and Woman" and "Girl with Monkey," respectively.

Inarguably, the most visible of Donkey Kong's predecessors is King Kong and his movie kin.

King Kong, filmed in 1933 and hor-

rendously remade in 1976, is the saga of a giant ape who tears up the streets and edifices of New York in search of his unwilling bride. Finding her with another man, he wrests the girl from bed and carries her to the top of the Empire State Building. There, Kong swats away attacking airplanes while the lady's lover races up the skyscraper to be by her side.

Like King Kong, movie apes who have had an affinity for women include *White Pongo*, *Mighty Joe Young*, and the robust simian of *Murders in the Rue Morgue*.

Nor have other media been spared

such monkey business. In comic books, Superman has frequently had to rescue Lois Lane from the clutches of Titano, the giant super-ape who scales tall buildings in a single bound. Likewise, Tarzan, the Phantom, the Flash, Conan the Barbarian and others have had run-ins with power-crazed apes.

So much for the misconception that apes are harmless. Indeed, it's clear that while scientists continue to praise the pacifism of the breed, they knew it was in the nature of the beast to be a video-game villain. After all, is there any other reason for zoologists to have given apes the scientific name of *Pongidae*? □



A clutch of hostile apes: Conan pummels a simian adversary, while Superman is pestered by Titano the superape, who was irradiated while on a space flight. King Kong tears up the town in a poster from the original motion picture, while a novel based upon the adventures of a rampaging gorilla graced a British magazine of the 1930s.



Edgar Rice Burroughs' Tarzan of the Apes was himself raised by monkeys, but fought more than a few of them in his day.

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DEFENDER

No longer will the popular arcade game blast you to atoms!

In the first two years after *Defender* made its debut, it took in more money than any arcade game with the exception of *Pac-Man*. *Defender* was Williams Electronics' first entry into the videogame sweepstakes, and it barely made it to the marketplace. The company had been producing pinball for decades, and the specialists who test these games before they're released tried to convince Williams that *Defender* was too complicated to win a following. They were only partially correct: *Defender* is complicated. Eugene Jarvis, who invented *Defender*, thought the public was ready for a more complex videogame and he was right. The very complexity of play is what brings people back to the game!

Conceptually, *Defender* is simple enough. The player is the "Defender." He or she controls a spaceship which is capable of shooting deadly laser rays and exploding invisible "Smart Bombs." The ship flies above an alien planetoid on which 12 tiny "Humanoids" are hiding. Using various weapons, the Defender must protect these Humanoids from an alien invasion.

"Landers" are the most numerous of the six different aliens you'll find—or who'll find you—in *Defender*. They look like green tri-pods with a ball on top, and their sole function is to kidnap Humanoids. Landers do this simply by descending to the planetoid's surface

and swiping Humanoids, who stand stationary and emit a shrill scream as they are being abducted. The Defender must either blast Landers before they steal a Humanoid, or take careful aim and shoot the Lander as it is ascending with a Humanoid. You don't want to shoot your Humanoids: They're your buddies. If a Lander succeeds in abducting a Humanoid and lifting it to the very top of the video-screen, the Humanoid is "eaten" and the Lander immediately metamorphoses into a buzzing, hornet-voiced "Mutant."

Mutants are extremely difficult adversaries. They will track your ship as it flies around the planetoid, hidden from view, then suddenly attack you from above or below. It is, therefore, not a particularly bright idea to hover near the top or bottom edge of the screen. The best way to destroy a Mutant is to lead it into the middle of the videoscreen where you can reverse the direction of your ship and blast the alien with a laser ray. However, Mutants (as well as Landers) are quite adept at hurling tiny white "bombs" at your ship from any direction, and you must be able to dodge these bombs. The Mutants' bombs are as difficult to avoid as most of the other aliens' bombs. They can either fire a bomb at the player's ship with deadly speed and accuracy, or deposit a bomb almost at a standstill beside them, hoping the player

will run into them.

What many players don't know, however, is that the Defender ship can *outrun* any bombs—whether they're thrown by a Mutant, Lander, or what-have-you. Keeping that in mind, lure the Mutant into the middle of the screen simply by flying there. While the Mutant may be firing bombs, you can easily out-fly and dodge them. Once you've managed to pass the Mutant itself, hit Reverse and fire away. The Mutant, while jiggling and jostling its way toward you rather mindlessly, will run into your line of fire.

For each Lander or Mutant you successfully destroy, the machine awards you 150 points.

Defender's next creature, a "Baiter" looks like a green, flying saucer. These hellbeaters—the most difficult aliens to destroy—will attack the player only when the machine has decided it's taking the player too long to destroy all the other aliens in any given "attack wave." They zip and whip around your ship faster than any other object on the screen. In fact, a Baiter is the only alien which can fly faster than the Defender's ship. As they near your vessel they will discharge a trail of those tiny white bombs. And the longer you take to finish off an Attack Wave, the more Baiters the machine will send in to destroy you.

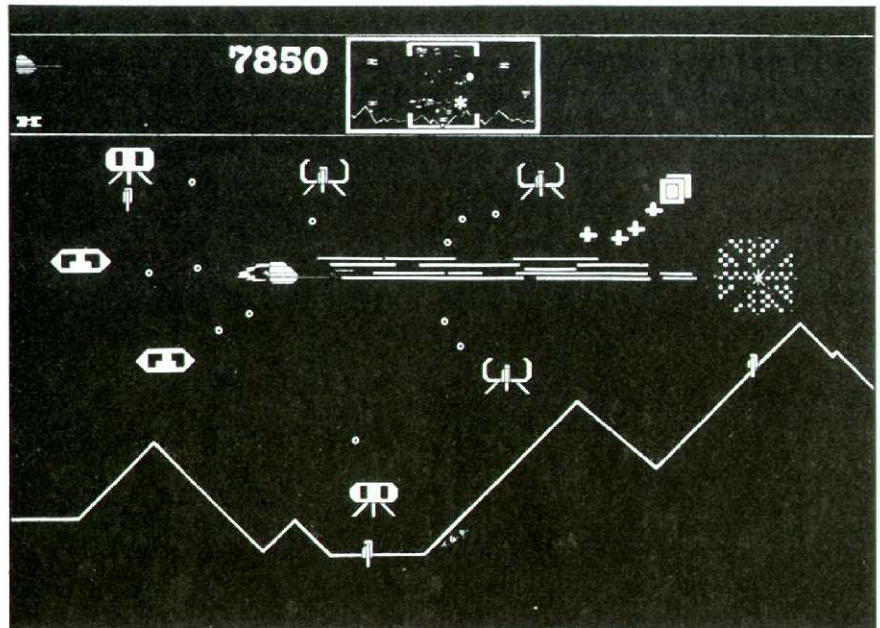
Like any other alien in *Defender*,

Baiters can be destroyed with a quick laser blast. But they are the most difficult objects to hit because of their quick, unpredictable movements. When players are unlucky enough to have a Baiter on their tail, the best thing to do is get out of the way *fast!* Baiters will come in one at a time (the player will first hear a distinct "warning" that sounds like "Zzziiiiiiipp!"). The Baiter will come from *behind* the ship but quickly surpass it, meanwhile firing shots in all directions. The Baiter hesitates, or "hovers," around the ship. Its bombs are not very accurate, but it fires so many of them that the player stands a good chance of running into one accidentally. Additionally, if the player stops thrusting completely the Baiter will automatically ram it.

If you find yourself the object of Baiter pursuit, wait until it gets in front of your ship, then press the Reverse button twice. This will momentarily confuse the Baiter, leave it hovering in space not doing much of anything. However, this behavior will *not* last long. Seize that fleeting moment to zap the Baiter with the Fire button, then proceed to destroy whatever is remaining in the current Attack Wave.

If you don't manage to destroy the first Baiter, or if you destroy it but don't finish off the wave right away, a second Baiter will come into play, and sometimes a third. When the ship is surrounded by Baiters, it's highly likely one of their not-very-accurate bombs *will* hit your ship. You can take a chance and jump into Hyperspace, but you might blow up on re-entry. It's best at this point to Smart Bomb the clutch of Baiters.

One last word on Baiters: If a Baiter comes in when you have your final alien or two of a wave in sight—that is, they're on the main screen—*ignore* the Baiter and concentrate on blasting the last alien(s). *You don't have to destroy a Baiter to finish off an Attack Wave.*



Before entering battle, do as any good commander does. Study the lay of the land and learn to recognize your enemy!

Each Baiter you do manage to destroy will garner you 200 points. "Bombers" are worth 250 points, but they're a lot easier to hit than most of the other alien creatures. They simply drift up and down diagonally and it is fairly easy to match their flight path, draw a bead, and dispose of them with a laser blast. Bombers look like dark-blue boxes, travel in threes (or multiples thereof in later stages of the game), and *don't* shoot bombs at you. What they *do* is deposit a string of mines in their wake as your ship approaches. These "x" shaped mines fade after a few seconds, but in the interim the Defender must maneuver around them. Running into a Bomber's mine will destroy the ship.

For a cool 1,000 points, blast a "Pod"—but be ready to deal with anywhere from two-to-twelve "Swarms" which will be hiding inside the Pod. The Swarms are tiny orange saucers which fire even tinier white bombs at your ship. Each Swarmer is worth 150 points, but because of their size they're difficult to hit.

In order to defend yourself and the Humanoids against this bevy

of alien invaders, *Defender* provides you with no fewer than six different controls.

The player's left hand must control both the joystick and the Reverse button, while the right hand must control Thrust, Fire, and the Smart Bomb. The Hyperspace button, as you can see, is oddly misplaced. It's completely out of reach, and to use it you must remove a hand from one set of controls. It's usually better to let go of the joystick and Reverse controls but, as will be explained in a moment, the better *Defender* players ignore the Hyperspace control anyway.

Despite the large number of controls in *Defender*, working them quickly becomes second nature. With patience and practice, supported by quick thinking and good hand-eye coordination, just about anyone can begin racking up respectable scores on the machine.

Constant pressure on the Thrust button will propel your ship forward at a steady speed. Lift up on Thrust and the ship will slow to a halt (it won't stop dead in its tracks). Short taps on Thrust will lurch the ship forward in jumps. There is no "best way" to fly the

The Aliens

as they appear
on the videoscreen!



LANDER

It always drops from the planet's sky.



MUTANT

The hybrid formed by Lander and Humanoid.



BAITER

It appears if a wave stays too long.



BOMBER

Slow; but its discharge could kill you.



POD

When shot, it showers you with Swarms.



SWARMER

A red peril that goes right after you.



DYNAMO

A checkerboard that fires Space Hums.



SPACE HUM

A mini-Dynamo which tracks your ship.



SPACE GUPPY

Fires long needles that are lethal.



FIREBOMBER

Vertically mobile, shoots Fireballs.



FIREBALL

Destructive red and yellow bombs.



PHRED

White and violet munchie-hoarder.



BIG RED

Yellow and red, same duties as Phred.



MUNCHIE

One of the green babies of Phred.

ship; all depends on circumstance, which constantly changes during play. If, for example, a Humanoid is suddenly snatched by a greedy Lander, you'll want to get to the scene as quickly as possible; uninterrupted pressure on the Thrust button seems ideal. However, there may be a hidden Mutant or two and you chance running smack into them flying at top speed. Many *Defender* players therefore find it helpful to hit the Thrust and Fire buttons simultaneously in quick taps. The ship will move forward at a swift but not reckless speed, with a laser ray as its deadly "headlights."

The Fire button fires a horizontal beam approximately 1/8" thick from the bow of the Defender's ship. Thus, your target must be located at the same fore or aft level as the ship. The laser is not a continuous-action device; one press on the Fire button releases one laser beam. However, *Defender* does give the player an advantage over some of the other videogames: You can press Fire as many times as you like and as rapidly as you like without running out of firepower.

At the beginning of the game, the player has one Smart Bomb for each ship. For most machines this means three ships and three Smart Bombs, but some *Defender* machines start out with four or even five ships and Smart Bombs. When a player's ship is destroyed, that ship's Smart Bomb survives and can be used at some point later in the game. Whenever possible, Smart Bombs should be saved for stressful situations such as the difficult Attack Waves or assault by a tangle of Pods. When the Smart Bomb button is pressed, all the aliens in view on the main screen are automatically destroyed. (Scanner aliens are not affected; see below.) The Smart Bomb won't hurt the Defender's ship, but neither will it destroy any bombs the aliens might have ejected prior to being obliterated by a Smart Bomb.

Players are awarded one additional Smart Bomb and an additional ship for each 10,000 points reached during gameplay. A player can stockpile any number of

Smart Bombs or ships, though no more than five ships and Smart Bombs will be displayed alongside the player's score. Any above that total are retained in the game's computer-memory.

While the Thrust Button controls the Defender's lateral speed and movement, the joystick dictates the ship's vertical movement. The instruments enable you to move the ship up or down without moving horizontally at the same time (not an especially profitable maneuver) and the joystick will even let you guide the ship below the planetoid's surface. Combining the Thrust and joystick controls, you can steer your ship virtually anywhere on the videoscreen.

The Reverse control button is an all-important device that allows you to fly in the opposite direction without a moment's hesitation. However, when Reverse is activated, the ship automatically moves slightly *backwards* at the same time it "flips over." Be careful! If you see an alien approaching from the rear and decide to flip and face it, the ship's brief backsliding motion might sled it right into the alien!

Hyperspace, as mentioned earlier, has more going against it than for it. This difficult-to-reach control will "dematerialize" your ship and "rematerialize" it somewhere else on the alien planetoid. This trick can be helpful if you are surrounded by buzzing Mutants or Baiters, but the ship may just as well incorporate *on* the alien, and you'll have the dubious privilege of seeing your ship splatter into 128 different pieces! Even the machine's instructions tack a strongly worded warning onto the explanation of the Hyperspace button. Because of the blind collision risk, experienced *Defender* players use this control only in the most *extreme* circumstances.

Above the main screen is a small display screen called the Scanner. The Scanner is a glorified radar which reveals the planetoid's terrain in its entirety. The display portrays the large videoscreen as a bracketed panel in the center, the rest of the Scanner revealing the landscape and objects which are in front of your ship as well as behind it. Humanoids are repre-

sented by light blue "chips" sprinkled about the planetoid's surface; the location of every alien and its movements are likewise shown on the Scanner, each alien represented by its own colored shape or symbol. The function of the Scanner is twofold: it alerts you to the presence of aliens beyond your immediate field of view, and it permits you to see exactly where the Landers are abducting your precious Humanoids. It's important to maintain a constant watch on the Scanner, but keep in mind that this device does *not* show any of the small white bombs ejected by aliens, nor any of the "mines" left behind by floating Bombers.

At the end of each Attack Wave—that is, after the destruction of all the aliens in any wave, excluding Baiters—the player is awarded bonus points. You have already earned five hundred points per Humanoid rescued, plus five hundred for each you get safely to the ground; in addition, you've scored points for blasting aliens. Now you receive bonus points, calculated by multiplying the wave number first by one hundred, then by the number of surviving Humanoids. Thus, if at the conclusion of Attack Wave one you have nine Humanoids left, you'll receive 900 points (1 x 100 x 9). If you have six Humanoids left after the third Attack Wave, you'll receive 1,800 points (3 x 100 x 6).

With each succeeding Attack Wave, play becomes more difficult. There are greater numbers of each alien to destroy, and the Landers attempt to steal your Humanoids at an ever-faster pace. If the player is unlucky enough to lose *all* the Humanoids before any Attack Wave through wave four is concluded, the player will be faced with the most horrendous situation in *Defender*: the "Alien Wave"! When the last Humanoid is eaten by a Lander, the planetoid blows up and the player's ship is suddenly, frighteningly alone in deep space—alone, that is, except for the aliens which remain from the current wave. They attack the player with terrifying ferocity, which means that the Defender faces Pods, Bombers, Swarms, and up to twenty Mutants all at once.

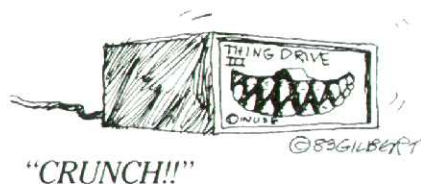
Players stand a fair chance of

surviving an Alien Wave if, before the planetoid explodes, there aren't many aliens still alive. A glance at the Scanner will show you how many aliens—mostly Mutants—are massing and moving toward the ship.

If there aren't many aliens, and your aim is sharp, you can survive the Alien Wave by picking off the aliens one by one. If there are many, you can divide them into two groups by pressing the Reverse button a couple of times. Then try your luck at one group.

When a crowd of Mutants surrounds your ship—you can't help noticing, it'll sound like you walked into a beehive—the only thing to do is Smart Bomb the mutant mass. You'll never gun them all. If you're out of Smart Bombs, all you can do is Hyperspace away and pray for safety! Another trick is to fly across the bottom of the screen during an Alien Wave. You'll avoid the Mutants, though at some point you've *got* to surface and blast some aliens. Baiters might also enter the Alien Wave Arena if (a) you don't finish off the Alien Wave, or (b) the aliens don't finish *you* off first.

Since an Alien Wave will only take place when your final Humanoid is kidnapped and eaten by a Lander, you can postpone or entirely avoid this nerveracking wave by catching your last Humanoid and continuing around the planetoid, wiping out aliens, while the Humanoid hangs onto your ship. Your Humanoid will not be destroyed by any alien or alien bombs; they pass through it. Further, if your ship is blown up by an alien or bomb, the Humanoid survives. It will show up back on the planetoid's surface as the machine gives you your next ship. You can catch as many falling Humanoids as you like before depositing them on the surface of the planetoid or carrying them around with you. You'll only actually *see* one hanging onto the ship, but any others you catch *are* there. The major



drawback to this policy is that if your ship is destroyed before you return Humanoid cargo to the planet, you do not get the points that maneuver would have earned you.

Of course, Alien Waves *can* be avoided. If you protect your Humanoids—even if there's only *one* left—and manage to finish Attack Wave four, *Defender* begins the fifth Attack Wave with a new set of twelve Humanoids to defend. (One of the game's few charities.) Another, less risky way to skip the Alien Wave is, again, by holding onto a Humanoid until the wave is completed. To do that, you must first become adept at *catching* Humanoids when they fall.

Humanoids plunge planetward when you blast any Lander which has abducted one. The Lander will explode and the Humanoid drops rather slowly to the ground. Immediately move your ship to beneath the drifting Humanoid; the figure will "jump onto" your ship. You can then lower your precious cargo safely to the surface—even while thrusting your ship forward. Once your ship touches the terrain the Humanoid will hop off, allowing you to continue battling the remaining aliens. This entire episode will garner you a neat 1,150 points: 150 for destroying the Lander, 500 for catching the Humanoid, and 500 for getting the poor creature back to the surface in one piece! There's another way to save a Humanoid if you're quick enough, even though this particular maneuver will award you only 250 points. If you are able to blast a Lander just as it is taking off with a Humanoid, the Humanoid will usually fall safely to the ground by itself. You must be a good judge of distances to make this play work: if you allow the Humanoid to drop from a blasted Lander that's more than one inch above the planetoid's surface, that tumbling Humanoid will explode when it hits the ground! If in doubt, it's usually best to go for the catch-and-return maneuver.

If you're just beginning to play *Defender*, you may become frustrated pretty quickly at the machine's capacity to dispose of your ships rather rapidly. As with all videogames, practice will inevitably increase your skills. □

How to turn your videogame **into** super-gaming center!

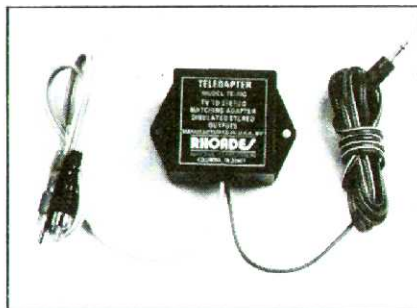
Videogame manufacturers have been busy trying to out-do each other for years. One will emphasize a hot license, another pitches their realistic gameplay. Atari, Odyssey², and Coleco are striving to beat the graphic excellence of Intellivision; even Intellivision is looking to one-up itself with a new \$700 Home Entertainment Computer. But subject matter, complexity of play, and true-to-life visuals are only a few of the factors which affect player enjoyment of videogames. They are the most *convenient* from the consumer's point-of-view: it's up to the manufacturer to build them right into the cartridge or console. As a result they are also extremely limited, nothing so flamboyant as to drive up the cost of the system. It is therefore up to the user to enrich videogaming with accoutrements which, when experienced in totality, will stagger the senses. Some of these embellishments can be made for a few dollars; others are considerably more expensive. Try one or try them all, they are guaranteed to transform your modest master component, homely and small, into the brain of an arcade unequalled for videogaming sights and sounds.

SuperSound

This issue's topic is enhancing the sound generated by your videogame. That does *not* mean just turning up the volume, mind you, but

adding tone and dimension to the output itself. This is one of the least costly forms of videogaming enhancement, yet at the same time one which produces some of the most spectacular results.

The basic equipment you will need are an amplifier and two speakers, plus an inexpensive TV-to-stereo adapter. There are a number of manufacturers who produce such units, but *Videogaming Illustrated* recommends any of the three *Teledapters* made by Rhoades National. The model TE-100 makes the connection for under \$20, while for twice the price the TE-200 gives you some measure of control over the level and tone of the output. Both plug directly from the earphone jack of the TV to the "phono left-right" jacks of your amplifier. And what do you do if your TV *hasn't* an earphone jack? No problem. The *Teledapters* are



An inexpensive unit like this can make gamesounds more exciting.

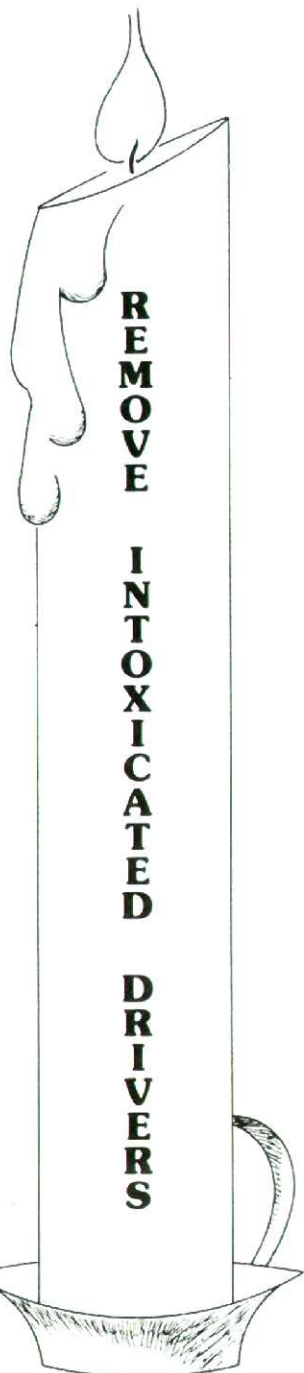
made to alligator-clip right onto the speaker terminals of the television. If, however, you're not electronically gifted, or are simply disinclined to remove the back of your TV, Rhoades offers a third alternative: the brand new TE-150X *Teledapter*. Priced at less than \$30, this device is positioned directly in front of your TV speaker and transmits the sound to your stereo amplifier.

All of these units contain matrix circuitry, which allows them to produce two channels of sound—in other words, simulated stereo. The first two units will, incidentally, *shut* the TV speaker, though the television volume will continue to control what is fed through the *Teledapter*.

If two sound sources fail to satisfy you, almost all amplifiers permit for the hookup of another pair of speakers. Even cheap speakers, used to accent the main output, can flavor the sound enormously. There is, of course, no need to stop with the four speaker combination. With the addition of one other piece of equipment, you can add a minimum of two more speakers.

There is, in the back of your amplifier, a pair of jacks marked "tape out," one jack for each speaker. For approximately \$100, you can fill these openings with a connection leading to TeleSound's *TeleStereo*, or any similar unit. This is a two-speaker device which, in plugging into the

"It is better to light one candle, than to curse the darkness."



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More costly than its companion, this Teledapter allows the videogamer greater control over the tone and pitch of videogame sound effects.

amplifier, does *not* automatically block the other sound sources. Thus, you end up with a total of six speakers. Running the *TeleStereo* to yet another amplifier/speakers setup can boost that sum to ten.

TeleStereo has one other advantage. If you like, you can plug it through the *Teledapter* directly into your TV earphone jack, doing away with the amplifier and its speakers altogether. The sound will not be as fullbodied, owing to the small size of the *TeleStereo* speakers, but it may be just enough for you. Or, you can wire your amplifier (at its "phono left-right" jacks) to the *TeleStereo*, hooking it to the free jack beside the *Teledapter* link. The sound feed will thus come through the *TeleStereo* to the amplifier rather than vice versa. The simulated stereo is sacrificed, but the sound from your stereo speakers will be considerably more crisp. Try them both and suit your own taste. The one breathtaking advantage of the amplifier hookup is if your equipment has a booster for low and high frequencies. Throw the switch to "on": the bass roar of the game will literally cause the windows to rattle! One asset to *either* system is that if your TV *hasn't* an earphone jack, you can plug phones into the *TeleStereo* or amplifier and play videogames as loud as you want even if the rest of the household has gone to bed. Furthermore, wearing phones during the space conflict videogames in particular adds enormously to the ambiance of the contests.

For those of you who prefer to watch rather than play with your TV, these connections also work for off-the-air or videocassette/videodisc viewing.

The *TeleStereo* unit has one other extraordinary virtue for the more flamboyant videogamers. Run the *Teledapter* from the TV to the *TeleStereo* mono input. Hook your stereo turntable to the amplifier. Plug your earphones into the *TeleStereo*: you can now listen to the videogame sounds *and* the music being piped into the phones, one layered atop the other. A drama created by having these sounds come from one source, as opposed to TV and stereo system independently, must be heard to be appreciated. *Asteroids* tends to play with much more self-importance accompanied by the music from *Star Wars*; *Pac-Man* is just a little nuttier supported by *The Minute Waltz*.

Sadly, there is no way to improve the basic gamesounds in the cartridges themselves. You *can* rig an external component to the joystick or paddle to create extravagant "firing" sounds; we'll be exploring this in a future column about dressing up the controls. Game impulses can also be used to trigger other sound and special effects, which will likewise be examined at a later date. For now, you'll have to content yourself with the raising to symphonic grandeur the electronic sounds the programmers have given us.

In our next installment of *Supergaming*, we will take a look at what you can do to make the videogame image itself far, far more imposing. Until then, we welcome your thoughts on the present column, as well as tips you'd care to share with the editors and fellow videogamers on how you turn *your* videogame into a Supergaming Center! □

*Researched by Samuel Lawrence,
written by Michael Alexander.*

THE MAKING OF VIDEO- GAMES

*How and Why Games
Are Manufactured*
by Richard Meyers

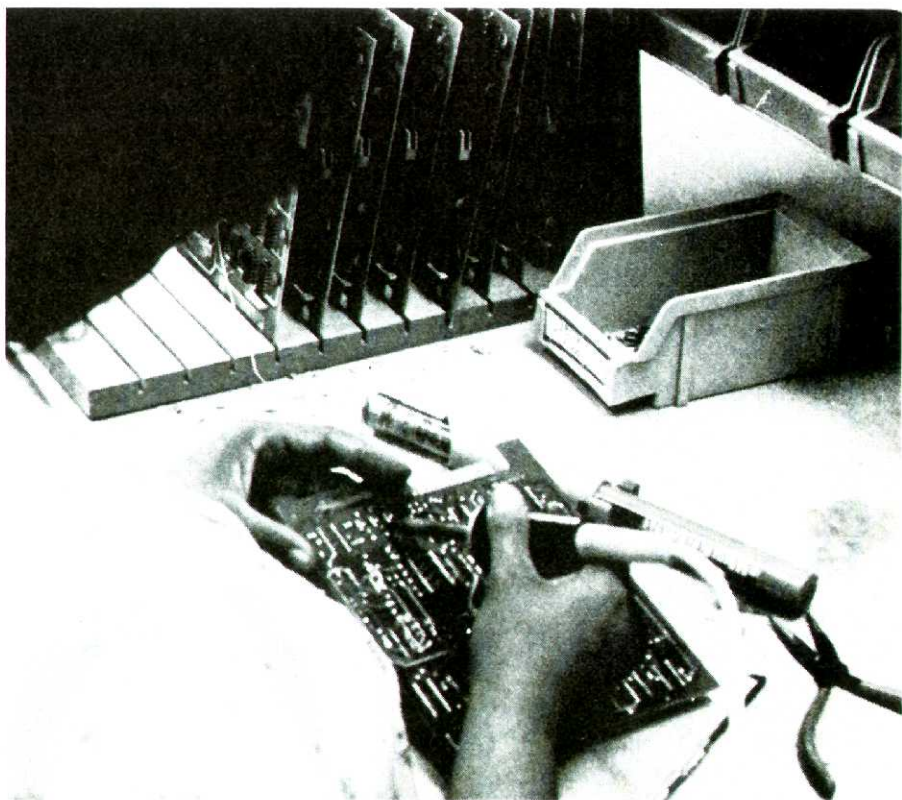
You've just sent your twenty-fourth idea to a videogame company after receiving your twenty-third polite form-rejection letter. Did you every stop and wonder *why* the manufacturers can't afford to work on every idea that comes their way?

"The companies are deluged with ideas," chuckles Joe Cicak, the chief of Gamexxx, an independent game designing company. "They have drawers full of ideas. Everybody in the world has an idea for a videogame. What they need to know is that the person can carry the idea out from start to finish."

It seems as if the video industry is the same as any other business. Everyone has ideas. The trick is making them reality — and, more importantly, from a business point of view, a practical and economically feasible reality. The idea is important, of course, but it's just the first step in the lengthy process of video creation.

"It is vitally important to have contacts within the industry," Cicak points out. "Whether you are an 'in house' designer or an independent, there has to be someone receptive to whom you can present your ideas. There has to be someone you can approach with ideas *and* with questions, questions like, 'Is it possible? Is it too expensive? Am I crazy?'"

Contacts within the companies are even more important. Most manufacturers won't even listen to ideas for



The process of assembling videogames for home or arcade is long and arduous. Here, at Exidy, a technician solders a printed circuit board. Other boards, stacked in a rack to her left, await the woman's attention.

videogames for fear of lawsuits if a finished game is similar to an unsolicited idea which came from an avid video enthusiast. They will return the idea unread and untouched rather than run the risk of coincidentally or inadvertently "borrowing" a concept from an eager writer.

Once the reception of an idea is positive, there's a lot of work the designer has to do before his or her contact can even approach other people in the company. Cicak starts his homework with extensive storyboards.

"The storyboard is the standard way of presenting any moving picture," he explains. "If you want to give someone an idea of how something is going to look you draw it in storyboard form — showing action that occurs every five or ten seconds ... or every key event."

A storyboard looks like a series of comic strips. Beneath each uniformly-sized drawing is an explanation of what is going on. "I have all the possibilities included," Cicak describes,

"what would happen is *this* gizmo attacks *that* watchamacallit. The whole thing is plotted out from beginning to end."

Assuming you can get in the front door, a basic, very amorphous idea is not enough for videogame companies even to consider. It's not enough to tell them that *Star Trek* would make a great videogame. The manufacturers need to know what the starship Enterprise can do, what the Klingons will do, what Mr. Spock would do, and so on. Just as importantly, as Cicak points out, the designer has to know what he or she *can't* do.

"It is not only a matter of what has to be included," he says, "but what has to be cut out. You have to look critically at your concept and inherently know what is or isn't going to work from both a technical and aesthetic standpoint. That takes a knowledge of technology as well as common sense."

The common sense comes in handy when a designer is trying to figure out



After the boards are assembled, technicians check them under conditions which simulate actual operation. The TV screen informs the operator whether or not all systems are functioning smoothly.

what each aspect of the game has to do in order to make the whole thing a success. But the scientific approach is even more important. The greatest gimmick in the world is useless if existing equipment can't make it work.

Cicak gets around the question mark of developing technology in a clever and effective way. "I storyboard it all out in the sense of what may be possible for present systems. Then I do some storyboards that are based on what will be possible a year or two in the future."

If an intrepid new designer has gotten this far, hit upon a million dollar game idea, storyboarded it out to perfection and convinced a manufacturer that it can be mass produced at a decent cost — what then? Joe Cicak has the answer, and as usual it's anything but simple.

"Once everyone has agreed that you've got a good idea, the company gives you authorization to set up a 'design team.' If you are off on your own somewhere, say Kansas or Melbourne you can set up a design team too, only you'll probably run into a lot more problems working outside the facilities of the manufacturers. Things that would take you months, maybe years to figure out have already been perfected by the majors.

"In my case, since I have a decent track record," Cicak elaborates, "they feel confident enough to provide the vital financial and technological support I'll need to get my machines off the ground. There is an awful lot of trust involved here because you are

privity to their methods and they are privy to your ideas."

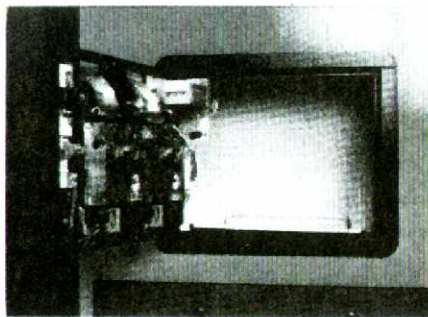
These "methods" are the stuff on which success or failure is based. These methods are what make *Pac-Man*, *Dig Dug*, and the *Stargate* ships do their things on the small screens.

Cicak explains, "You have to spend months and months programming on one of the companies' or on your own graphic video animation devices, units which are controlled by microprocessors. What we're doing is computer animation, just like the stuff you saw in *Tron*. In fact, *Tron* is a motion picture which exemplifies what video design is all about. We're playing around inside a video cartoon."

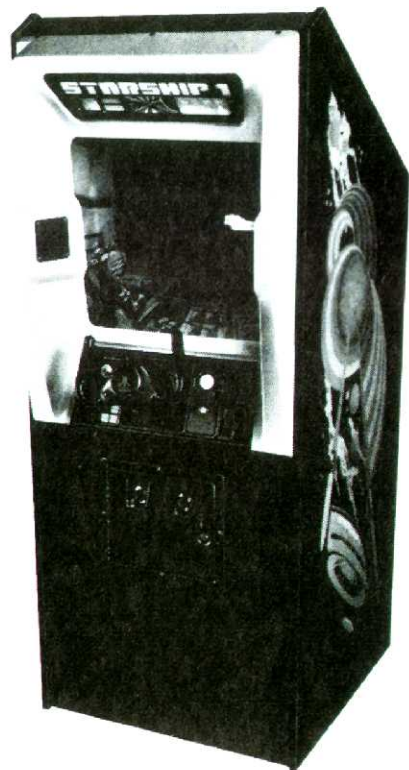
Utilizing a computer language which controls the electrical charges that serve as the computer's thinking process (see "Close Up" in our October issue) programmers translate concepts by Cicak and other designers into technological existence. "Half the time we're programming," Cicak reports, "the rest of the time we're 'de-bugging' what we've done. You have to make everything go the way you want it without creating kinks or loopholes that can certainly be exploited by a clever player."

To make it work requires the all-out efforts of the design team. At its most basic, this team consists of personnel in three departments, hardware, software, and what Cicak calls "conceptualization."

"The hardware is the brains, the body, the guts, of the arcade machine," Cicak defines. "That means the wires, the chips, and almost everything that goes into the machine. The software is the computer program that someone has written which will function within



A look inside Midway's Kickman. Everything you see on-screen, all the graphics and every bit of the player's input, is controlled by this small compartment laden with wires and circuits.



Unusual control panels, as in Atari's Starship 1 arcade attraction, may require some extra testing. Rough, down-to-business play sessions in actual arcades are required to iron out the kinks in any new design. These are the kinds of discoveries designers can't make in their cool, easy workshops.

that hardware system. That's what makes the pictures appear."

In non-technological, perhaps more understandable terms: the hardware is the brain and the organs. The software is the collection of thoughts that make the whole thing work. "The intricacy and look of the software depends on whether you are using the company's computer system, whether you're using a satellite (ie, comparable) system, or whether you are using a system totally independent," Cicak adds.

The conceptualizer is basically the idea person — in this case, Joe Cicak himself. "I think of video game design like a movie," he says. "A movie is the result of many minds working to realize the images of a few. The best results come as a result of a solid team toiling toward a single person's inspiration. They all work toward a striking look, great action and a good story.

"Since video games are smaller than movies, one person can take on several jobs. I would be considered the director and scenic designer. The programmers would be my camera, lighting and sound personnel. The hardware people would be everyone else."

While the design team toils, the company is taking care of business. They want to make sure that everything is ready on their end when the conceptualizer arrives with the finished machine. "The companies usually handle the cabinet and the various 'interfaces,'" Cicak maintains, "meaning the control stick and that sort of thing. They look at it from a manufacturer's point of view. They have to be sure that they can mass produce it efficiently which is why they handle all the peripheral things like the outward appearance of the cabinet. The designers handle everything on the screen."

It all comes together at this point. The team sticks their hardware and software into the company's cabinet and thus a videogame is born.

One, lone machine that has hopefully lived up to all the creators' expectations.

But the process does not stop there. Manufacturers have learned the hard way not to be content with their own tastes. The final judge has to be the player — the person with the coin. In other words, you.

"The company makes a few machines and puts them on test in various secret locations all over the country," Cicak reveals. "Sometimes they don't even reveal the name, to make it more mysterious. After all that time, effort, and money, they don't want their competitors to steal any thunder."

All the secrecy is understandable given just how expensive that thunder can be. Cicak says that a minimum price tag for the development of a single new videogame is a half-million dollars. There have been cases on record where the cost has gone as high as three million dollars. And if new technologies are researched and forged, new kinds of chips or controls, the expense may soar ever higher.

"The company will watch the prototype games in the field, and keep records of the two 'M's,'" Cicak continues, "money and maintenance. Depending



For reasons explained by game designer Joe Cicak, the cabinets and artwork which adorn them are standardized for a very good reason: they must be mass-produced as quickly and as inexpensively as possible.

on that they will make their final decision, which is usually one of three. One: it's ready to go. Two: it needs changes. Three: it's a worthless idea."

Thankfully, Cicak has never had many worthless ideas.

Although he and his contemporaries work well under the present conditions, Cicak is looking forward to a future of even greater accomplishment and challenge.

"The systems we're working on now will become more and more flexible until even someone with no programming experience and only a basic understanding of the equipment — like me — will be able to sit down and make it almost all work. That is some years away yet, but not as many as people seem to think. You'll be able to invent arcade games at home before long."

So, hopeful designers you have a choice. Either start making your company contacts now or sit tight and wait for the fast-approaching future. It will be glorious, it will be invigorating, and it will *never* be boring. □

Next time you finish a roll of bathroom tissue, take the roll and cut it to a height of approximately 2 1/2". Slice it in half, lengthwise. Take a 3" x 3" sheet



The wiring inside the Power Unit.

of aluminum foil and lay it inside the makeshift dish, using tape to fasten it in back. Use one of the "super glues" to cement the dish to the lamp base.

Obviously, you can experiment with the size of the roll until you get the maximum flash; this was the only one we had time to build.

In any event, this dish is much more fun to create than simply pulling apart a flashlight, and is more of a conversation piece when one of your fellow videogamers asks how you did it.

What we have done to date is given you instructions on how to enhance the sound of your videogaming (*Videogaming Illustrated #1*) and add some flair to the explosions via stroblasting.

Next issue, we'll be taking you in a new direction entirely as we tinker with the hardware to make gameplay easier. □



Triple Play

focus on

A Field Guide to

Videogame E.T.s

Videogame extraterrestrials are less kindly than the E.T. featured in that popular film. Play it safe: learn to recognize the dastards on sight.



ET PHONES YOUR HOME

The phenomenally popular film *E.T.* is about to become a home videogame from Atari.

The announcement comes as a surprise to absolutely no one, though *E.T.*'s videogame home is a surprise.

The object of the game will be to get *E.T.* home by maneuvering the alien through a variety of impasses similar to those used in the motion picture.

The game is being touted as more than just a challenging cartridge. Atari promises that it's going to be the first "emotionally oriented" videogame.

Atari expects that, like the *Star Wars* videogames being manufactured by Parker Brothers, this *E.T.* game will be the first of many, and will be as much of a commercial success as their *Pac-Man* cartridge.

As noted elsewhere in our pages, Atari also has the videogame version of another popular film, *Raiders of the Lost Ark*, ready for shipping.

The *E.T.* game will be on sale early in December.

The obvious question is why Universal Pictures elected to license *E.T.* to an outside company rather than give the enormously lucrative property to their own newly created videogame wing.

The answer is twofold: licensing discussions with videogame companies commenced before Universal formed its

With all the publicity that pug-nosed, mud-colored alien from *E.T.* has been getting, it's easy to forget that most videogame aliens want to devour or blast you, not help you ride through the air on a bicycle.

Just in case you happen to be eating Reese's Pieces and an otherworldly denizen levitates your way, we've gathered a "Most Wanted" list of home videogaming's most wicked aliens, those who would sooner eat Mr. Reese than his pieces.

The following file is as complete as present knowledge allows. These intergalactic malfeasants are decidedly difficult to interview.

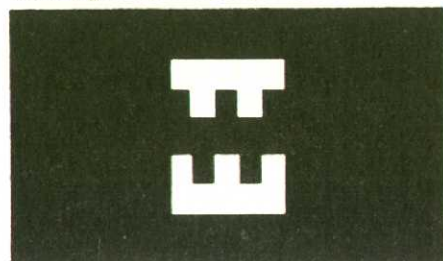


videogame division — which is why *King Kong* went to Tigervision — and that there is no way the new company could have gotten out the cartridges as effectively as Atari, certainly not in time for the Christmas season.

Ironically, Atari is owned by Universal Pictures' moviemaking rival Warner Communications.

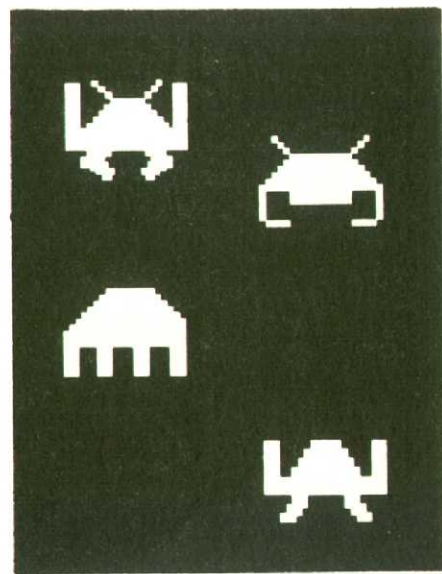
Alien Invasion

Their only calling-cards are the deadly projectiles they loose while heading earthward in rows.



Astro Battle

More nameless terrors, descending in a phalanx and dropping bombs upon earthpersons.



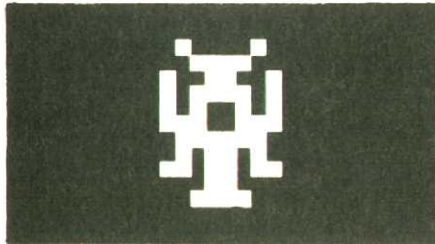
Alien Invaders-Plus

The villain here is a killer by name of Merciless Monstroth. This being is part mechanical, part biological. Its head is a domed city, its body the juncture of five twining serpents. The underbelly of the creature is an opening which emits robots, proxies which do battle for the invader. Monstroth is approximately forty feet tall and eighty feet across.



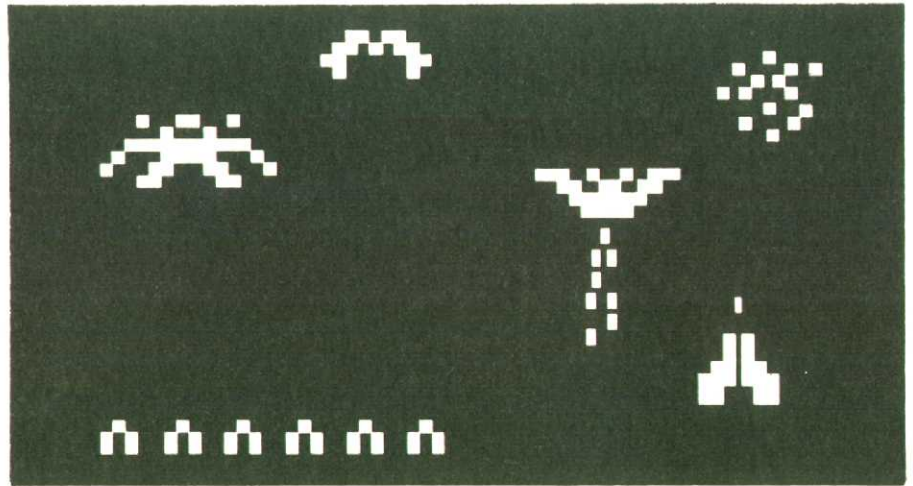
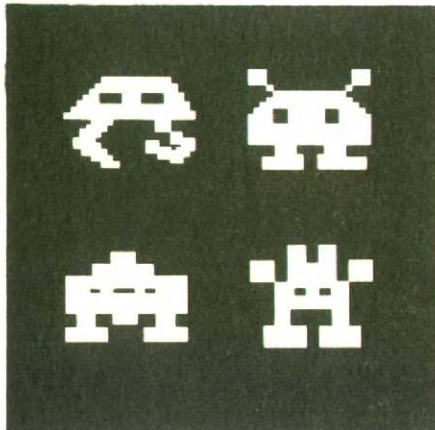
Yar's Revenge

Yars dwell on the third, fourth, and fifth planets of the Razak solar system. They are descended from house flies which were borne accidentally into space onboard an interstellar craft. Mutated by radioactive dust from the crash of said vessel, they can eat anything and convert matter into powerful energy missiles. Their enemies are not humankind but the Qotile, invaders from a nearby moon. As these invaders never leave their shields, no one knows what they look like.



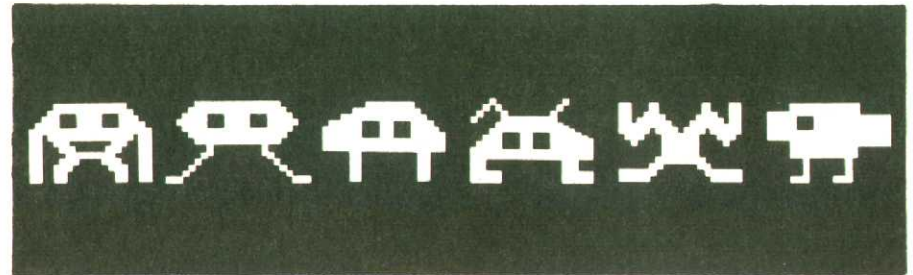
Space Armada

Like the monsters of *Space Invaders*, these creatures descend in rows and have no names. Also like their sinister brethren, they discharge projectiles and can become invisible.



Demon Attack

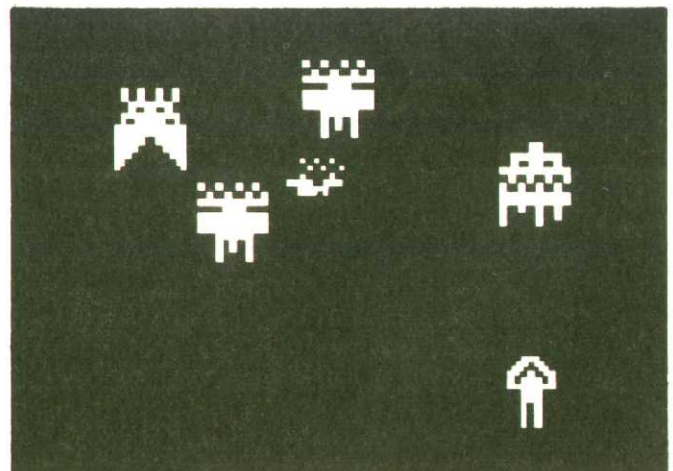
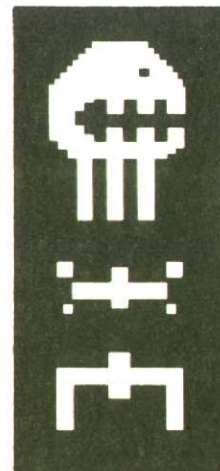
Winged predators who fly in devastating waves. Known only as "cosmic creatures," these merciless extraterrestrials unload destructive eggs in a display of unabashed hostility.



Space Invaders

The multicolored creatures move in orderly ranks, speeding up as their fellow aliens are disintegrated. They spit out bombs and, upon landing, consume laser cannons. The creatures can become invisible under certain circumstances, though all light up when one is slain.

These gravity-defying entities have no names.



Space Cavern

As identified last issue, there are six inhabitants of an uncharted world in deep space. There are five kinds of Electrosauri and they come in two sizes, three large and two small. All of them are airborne and inclined to unleash concentrated — and lethal — charges of electro-molecular energy, which cause objects to dematerialize. The Marsupods are planetbound. Covered with a fine coat of hair, they live in caves and enjoy using their six massive teeth to eat earthpeople. □

computer eyes

SPECIAL "K'S"

What's a "K" and how does it determine which computer you buy?

by Martin Levitan

People are always talking about it, slinging the letter around in conversation.

"Oh, this little number has 32K."

"I can upgrade *my* computer to 48K."

You sit there, nodding, acting impressed, afraid to admit the truth — that they might as well be addressing you in Aramaic, since all you know about a "K" is that it has something to do with the inside of a computer.

Then again, maybe it doesn't.

Then again, you wish someone would just take you by the hand and explain the whole bloody thing from the very beginning.

Which is exactly what we're going to do.

What is a "K"? How did it set into the computer, and what's it doing in there?

It all goes back to the fact that human beings possess ten fingers.

When people began to use numbers, they knew only one way to work with them: to count. The most forthright and therefore most common

approach was to use the fingers. Expanding this capacity by employing the toes did not gain favor, shoes having been a factor. It was a bother taking them off. Thus, we came to deal with numbers in parts or multiples of ten fingers.

Little by little, people discovered how to add, subtract, and multiply; but this was slow work using ten digits. By the time he multiplied eight melons by seventeen shekels, a merchant might well see his produce rot. Thus, in some countries, special devices were invented to make computation easier, especially in dealing with large numbers.

The Romans used a counting table, or abacus, in which units — fives, tens, and so on — were represented by beads. These could be moved in such a way that when you had accumulated ten beads in one column, you jumped to the next column where *one* bead represented those ten.

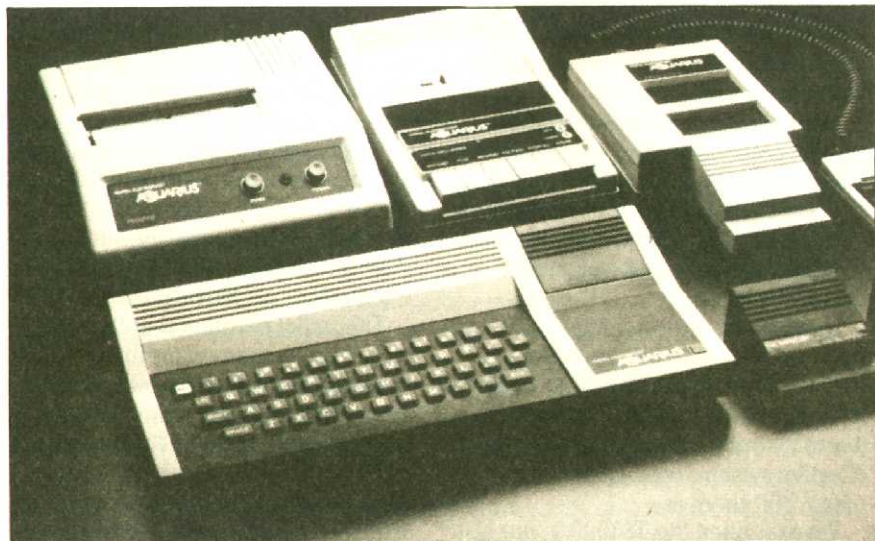
Seventeen would thus be a "ten" bead and seven "one" beads. Repeating that eight times — shifting to the

"ten" column each time you accumulate ten "ones," and sliding a bead to the "hundred" column when there are ten "tens" — gives us one "hundred", three "tens" and six "ones." One hundred and thirty-six. How convenient!

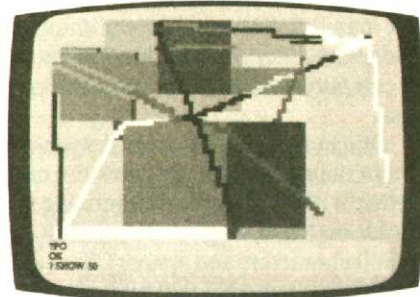
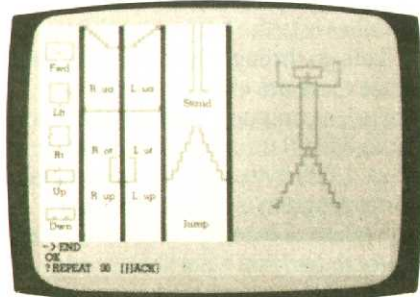
Jumping through time, the Industrial Revolution saw many attempts at mechanical computation machines, most using the base of ten. As recently as the late 1940s and early 1950s, the first primitive "electronic" computers attempted to use decimal base arithmetic — i.e., fractions or multiples of "ten" — for their computations.

However, these old electron tube devices needed too much memory to deal with the number ten. That is, there were too many "beads" to move around electronically (the columns of beads, in this case, being columns of switches). The solution was to change number systems to take advantage of the fact that machines exist in two natural states: on and off. This numbering system is called binary, for two.

The smallest amount of information



Mattel has ambitions of grabbing a portion of the home computer market. Shown here is their new Aquarius computer with its expandables: a printer, data recorder, computergame unit, and memory expanders.



a computer could handle was a "bit" or binary integer; a "one" (switch open) or a "zero" (switch closed). To represent larger numbers more bits were needed. What we know as the numbers 0,1,2,3,4 in finger notation became 0,1,10, 11,100 in binary.

Why those particular combinations? Obviously, you can't have "three" and "four" both represented by "11". So, if we're limited to ones and zeros, the arrangements cited above are the simplest next-step-up from the one before it.

Switch closed: zero.

Switch open: one.

Open-shut combination: two. And so on.

All lightning-fast.

Being the smallest piece of information a computer can handle, a bit by itself isn't too useful. However, eight bits combined into one "byte" can be used to represent any number, the letters of the alphabet, punctuation, and even graphic characters.

These strings of eight bits are used to arrange groups of circuits inside the computer. Hence, when you put in your cartridge or disk on which the arrangement of bits is stored, the computer circuits read the road map, snap-to, and flash the information of the screen.

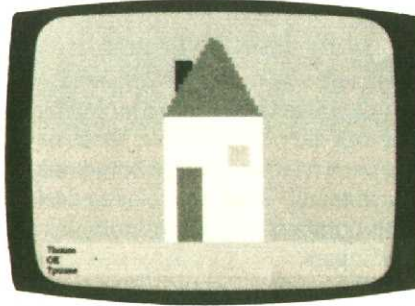
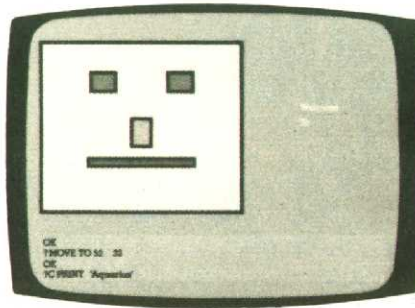
Each location can store a certain number of bytes. The number of bytes which can be stored defines the computer's power or "memory." If your machine can hold 64,000 bytes — give or take a few hundred — this is referred to as 64K bytes of memory.

"K" is simply a scientific notation that tells you to multiply whatever number is to the left by one thousand.

Let's go through that one more time: since there are eight bits for one "byte", a computer memory that can store 8,000 bits can also be said to store 1,000 bytes, or 1K byte. A computer program is, again, merely a collection of bytes which cause a computer to perform a particular task.

It is not necessary to know more than a few simple facts about all this bit manipulation and byte-counting to judge the amount of working memory a computer will need for your home use.

One byte (eight bits) of disk space or main memory is required to store one letter or symbol. A typewritten page holds on the average of 250 words (1500 characters and spaces). It would take 1,500 bytes (12,000 bits) of com-



Software programs for children for the Aquarius computer include tutorials in math and spelling. For the present, adult-oriented programs are concerned with home management, including Hints From Heloise.

puter space to store one page as computer code; therefore, it takes 1.5K bytes of computer space to hold one typewritten page in main memory, 30K bytes of computer space to hold twenty typewritten pages.

As we discussed at greater length in issue two, the working memory of the computer is called RAM — random access memory. That means you can influence what happens on the screen, as opposed to read only memory, or ROM.

RAM is measured in thousands of bytes or K bytes. The amount of RAM you need depends upon the programs you plan to run.

Most game programs, even the sophisticated chess and adventure games, will run comfortably with 16K bytes of RAM. Many simple utility programs, such as personal finance, and meal planners are also designed to run on 16K bytes.

In choosing or designing a computer system, whether for home or office, the most important consideration is the human interface. If a system doesn't work for the user, it's not an effective system, regardless of how many "Ks" there are.

We examined the TS1000 in our last issue and found it a good if simple beginner's tool. Now that you've met the elusive K, we continue our look at

"user friendly" personal computers with two other new units now on the market. Both boast more "K" than the TS1000; let's see what that means for you in a practical sense.

From Mattel, the folks who brought us Intellivision and M Network, comes a new entrant to the home computer race. Using the same marketing approach that revolutionized the toy industry and has been copied by every manufacturer since, Mattel will field the Aquarius home computer.

What marketing approach is that? The add-on philosophy! First, there was Barbie, then clothes for Barbie, then Ken for Barbie, then clothes for Ken, then a house for both.

For three years Mattel had been planning to bring out a computer keyboard for its Intellivision console. It finally test marketed a keyboard last spring. The perfected unit, and other peripherals, will be on the market soon. In the meantime, however, Mattel developed another product to which peripherals could be added: the Aquarius basic unit.

The retail price for that basic unit is approximately two-hundred dollars. Only some of the popular Intellivision videogames will be made available in the Aquarius format; the cartridges will not be interchangeable with other systems.

You can purchase the .13 x 6 inch Aquarius "starter" unit, complete with the forty-nine digit moving-key keyboard — as opposed to the flat "membrane" surface of the TS1000 — without buying any other attachments.

As you become more familiar with the keyboard and the various functions of the basic unit, you can then decide which peripherals to add to the system.

The basic unit features 256 different graphic characters — numbers, letters, etc. — as well as sixteen colors. It has a built-in 4K byte capacity, but has a variety of different expanders that permit an eventual byte capacity of 52K.

The initial peripheral units being placed on the market for this system consist of the Aquarius data recorder for program storage, which is essentially a matching audiocassette player.

Then there's the Aquarius printer, which is capable of printing 256 characters — including upper and lower case letters, numerals and special graphic characters. Like the recorder, the printer is attached directly to the

Aquarius console without requiring additional interfaces. An extremely quiet unit, the printer allows "screen dumps," the reproduction of graphics — not just text but pictures — in the exact configuration they appear on the television screen.

The Aquarius Mini-Expander allows simultaneous use of both a videogame cartridge and an Aquarius memory expander cartridge. It plugs directly into the cartridge port and, once in place, provides the user with instant entertainment in the form of game cartridges in Aquarius format.

The Mini-Expander comes with two hand controllers, each boasting a sixteen position disc and six action buttons.

Four basic types of software are available for Aquarius:

Entertainment

The Intellivision game themes which are being duplicated in the Aquarius format include: *Astrosplash*, *Snafu*, *Tron: Deadly Discs*, *Football*, *Lock N' Chase*, and *Advanced Dungeons & Dragons*. There will be more, since videogames remain a strong selling point for computers.

Education

The educational programs for children will include *Math and Mazes* and *Spelling and Space*.

Home Management

These programs include *Finform*, an electronic sheet to keep track of household finances and serve as a forecasting tool; and *Fileform*, which allows users to perform a multitude of text-oriented tasks in the home, from maintaining lists to compiling information.

Self-Improvement

Programs in this category include such subjects as a guide to personal nutrition, a course in speed-reading, music composing and appreciation, and a typing tutor.

The financial community has said of Mattel that they must shift from being a toy company to being a company which specializes in sophisticated electronics.

Mattel has come up with a friendly and inexpensive entry into the home computer race. While there is nothing particularly *innovative* about this Mattel product, it's a solid tool for the purposes described above.

Speaking of inexpensive, Timex is still the uncontested ruler of lowcost computing. Their latest effort is the



The Timex Sinclair 2000 and the 2040 thermal printer, which boasts full graphics and text capability, thirty-two column width, and a printing speed of two lines per second.

Timex Sinclair 2000, which is designed to replace their blockbusting TS1000 (see last issue).

This 48K computer carries a suggested retail price of under \$200 and features high resolution color graphics, programmable sound, and a movable key typewriter-format keyboard.

A 16K version of the computer will have a suggested retail price of \$149.95.

At those prices, Timex and their British partners will sell a lot of hardware, just as they did the TS1000.

With more memory and different styling, the TS2000 will win it a wide following. Also in its favor: the machine is compact and lightweight, measuring $9\frac{1}{8} \times 5\frac{5}{8} \times 1\frac{1}{4}$ inches and tipping the scales at an ethereal twenty ounces.

On the debit side, it may be just a *bit* too compact for adult-sized fingers to comfortably use the typewriter-style keyboard.

In one area, however, the manufacturers must have been listening to the collective user muse: their software comes in the form of mini-cartridges. Small enough to fit in the palm of the hand, they plug directly into the computer. This does away with the need for a cassette tape recorder as an input device.

The suggested retail price for the cartridges will be under twenty-five dollars.

The home cassette route is still available for storing and loading your own programs and data, to which end Timex has also addressed the earlier problem of sluggish tape loading. The TS2000 allows the user to load and save up to 16K of memory in approxi-

mately one hundred seconds. That may not be quick by Apple/IBM standards, but it's not bad for one-tenth the pricetag.

Timex has also announced a thirty-two column dot matrix printer. Compatible with both the TS1000 and TS2000 personal computers, it will retail for \$99.95.

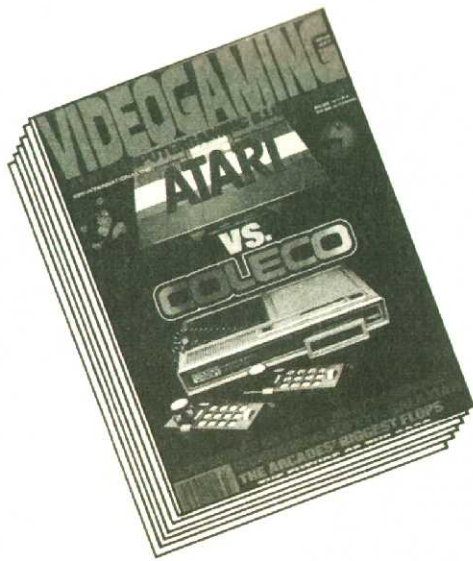
And hark, computer music lovers: Timex hasn't forgotten you either. The fully-programmable sound capability of the TS2000 is provided by a built-in loudspeaker with a range of ten octaves and 130 semi-tones. A "beep" command capability permits the user to set variable pitch and duration, making it possible to compose music with each keyboard stroke.

Initially, over forty Timex software programs will be available for the TS2000, offering users convenient application from business and personal financial management to education and entertainment.

Timex plans a number of add-on peripherals in coming months, including a communications interface device or "modem" which will allow users to plug Timex computers into standard telephone equipment for direct access to computer data banks and telecommunications services the world over. (This will allow computer users to exploit home shopping and banking services as they become available.) Consult your local dealers for further information.

So — that's what all those Ks can do for you. Next issue, we'll take a look at what Atari is doing with *their* Ks, and discuss BASIC plus a few other computer languages you've been hearing — and wondering — about.





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Continued from page 42

many monsters as possible — as long as you remember to move out of the way of the falling rock.

If you do not move from under the rock quickly enough, you may be crushed along with any monsters beneath you. Players receive no extra points for their own death; however, you will still receive points for any monsters that are killed with you under the rock.

The most important aspect to playing *Dig-Dug* is to develop patterns for the many different board configurations. You will find that if you move in a certain direction and kill a couple of monsters under a rock, the tack will work exactly the same way on the next game you play. Because of this predictability, it is a simple matter to develop patterns for even the most highest rounds of the game.

A few patterns for beginners are offered on page 60.

Extra Figures

On most *Dig-Dug* machines three figures are given to you with a bonus life at 10,000, 40,000, and every 40,000 points afterwards. However, some *Dig-Dug* machines are set for free figures every 70,000 points. If you run up against a machine set at that difficult, you probably will not be digging through the dirt for very long unless you are already a skilled player.

If you were to go all the way to 880,000 points without losing a figure, you would have a total of 26 diggers. This is the maximum amount the game allows.

Keep in mind that even though only nine figures will be shown on the bottom of the screen, any extras you have earned during your game will be kept in the computer's memory.

Vegetables

A very important aspect of playing a high scoring game of *Dig-Dug* is to run over the various vegetables that appear in the center of the screen. In order for the vegetable to appear on any given round, you must drop two rocks and then head for the center of the screen for your bonus points.

You receive an ever-increasing amount of bonus points for the vegetables as the rounds progress. It is especially important for *Dig-Dug* to eat his vegetables in the later rounds when you want big points in one easy gulp.

The following chart shows the vege-

tables names, amount of points they are worth, and the rounds in which they appear.

Rounds	Vegetables	Points
1	Carrot	400
2	Rutabaga	600
3	Mushroom	800
4	Cucumber	1,000
5	Cucumber	1,000
6	Egg Plant	2,000
7	Egg Plant	2,000
8	Bell Pepper	3,000
9	Bell Pepper	3,000
10	Tomato	4,000
11	Tomato	4,000
12	Onion	5,000
13	Onion	5,000
14	Watermelon	6,000
15	Watermelon	6,000
16	Galaxian	7,000
17	Galaxian	7,000
18 and above	Pineapple	8,000

Keep in mind that when you drop the second rock on any given round, the vegetable will appear for exactly ten seconds. Try to position yourself so that when you do drop the second rock you will have a reasonable chance of hurrying to center-screen to receive your bonus.

Dropping Rocks

The best and easiest way to kill monsters on any given round is to drop a rock on them. Many of my patterns involve dropping rocks on large amounts of monsters. This technique is very valuable in the later stages of the game.

The chart below shows the amount of bonus points awarded for dropping a rock on various numbers of monsters.

Monsters Devastated	Bonus Points
1	1,000
2	2,500
3	4,000
4	6,000
5	8,000
6	10,000
7	12,000
8	15,000

Some of my more advanced patterns involve dropping a single rock on at least six or seven monsters. This kind of strategy is necessary if you hope to score over 2,000,000 pts. with *Dig-Dug*.

Dirt Layers

There are four different dirt layers on the *Dig-Dug* playfield. These layers of

dirt are directly related to the amount of points you receive when blowing up different monsters from various directions.

The Pookas are worth the same amount of points regardless of the direction from which you blow them up. You will receive a maximum of 500 points for popping a Pooka while it is in the bottom dirt layer. If you blow up a Pooka in the top dirt layer, you will receive 200 points, the second dirt layer 300 points, and the third dirt layer 400 points.

When blowing up Fygars you will find they are worth the same as Pookas, 200-500 points when blown up vertically. Because the Fygars breathe fire, the game awards double scoring for blowing up Fygars horizontally, the direction in which they exhale flame. It is possible to receive anywhere from 400 to 1,000 points for killing Fygars in this manner.

It is best to take advantage of the lower dirt levels whenever you cannot drop a rock on the monsters.

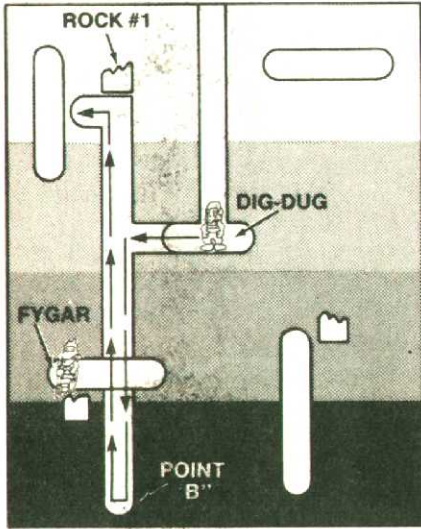
Rounds

In playing a game of *Dig-Dug* the player will be digging through round after round of different board configurations. Starting with round one and traveling to the end of round eleven, you will find that each board is arranged differently. It is necessary to develop patterns for these first boards, a few of which are suggested in the accompanying screens.

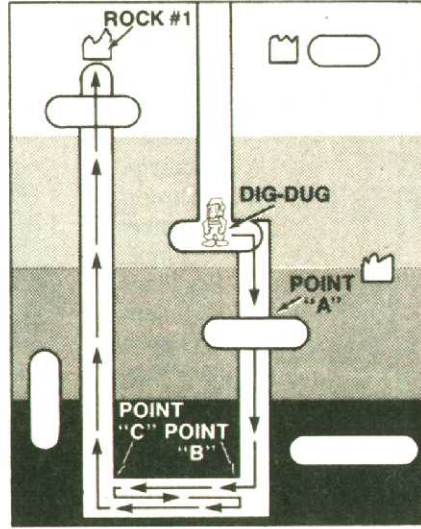
Starting with round twelve *Dig-Dug* becomes slightly easier. The game starts showing a cycle of four different board configurations over and over for the rest of the match. Once patterns are developed for rounds twelve through fifteen you will find that they work the same for the next twenty rounds, at which time the monsters pick up speed and the patterns must be modified to compensate.

Developing patterns is the most important part of playing *Dig-Dug*. Many players, good players, have developed a total of twenty-four patterns which is sufficient to take them over the 100th round.

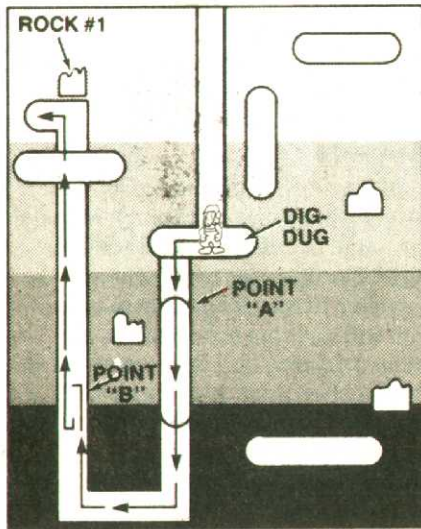
After the 99th round, the round-counter in the lower right-hand corner of the screen goes back to zero. Also, following this round all the flowers you have accumulated at the top of the screen will disappear. When the round-counter is rolled over it does not change



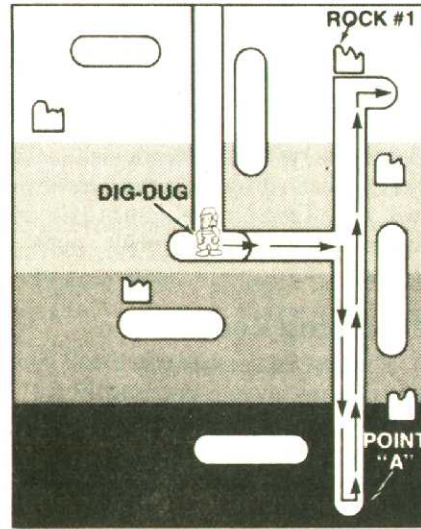
Round 1



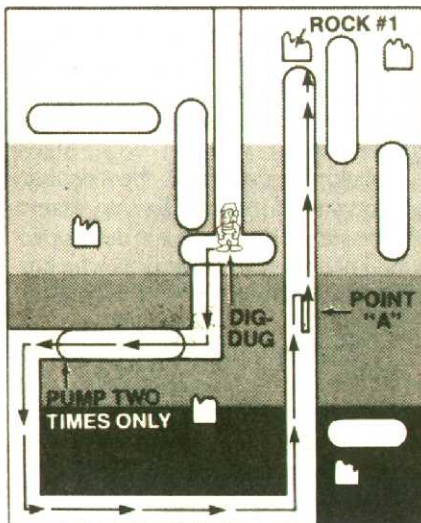
Round 2



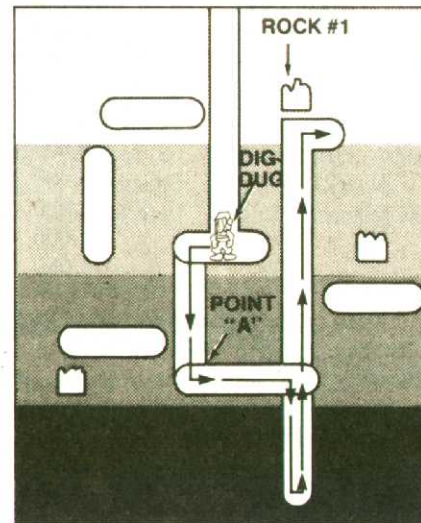
Round 3



Round 4



Round 5



Round 6

your patterns or the difficulty level of the game at that point.

Scoring

Keeping track of your score is important in *Dig-Dug* mainly because of the large variation of ways it is possible to clear off a round.

For instance, on round one it is possible to tunnel up under a rock and kill all the monsters in a single maneuver using just one rock. If this is done properly, a player can receive over 6,000 points on round one — which is obviously much better than simply blowing up the monsters individually and scoring only 2,000-odd points for this round.

In fact, it is possible to score 100,000 points on the first ten rounds if you develop patterns that involve crushing almost all the monsters under one rock. This strategy quickly builds up your stockpile of extra figures as well as adding points to your score.

The scoreboard on *Dig-Dug* is a very interesting part of the machine. It holds a total of five top scores, a record which is always on-display, along with the player's initials and the highest round reached.

The only flaw in the machine is that it does not register scores over 999,990 points. If you have attained a score of 999,990 on a machine you will remain in the number one spot on the scoreboard as long as you were the first one to reach this score or until the owner of the machine erases all the scores.

In playing a game of *DIG-DUG* you will notice that the first eleven rounds are totally different from each other. Because of this, it is necessary to make up individual patterns for each of these rounds.

The following patterns will help beginners take control of the game and will help advanced players score more points in their early rounds.

After the first eleven rounds are cleared, the game starts repeating a cycle of four different board configurations which makes it easier to successfully complete many boards without losing too many men.

Good luck!!!

When using this pattern on the first round, you will smash three to four monsters under rock #1. At the beginning of Round One, move your figure to

Computers in Orbit

*Computer technology is helping
to build our future in outer space*

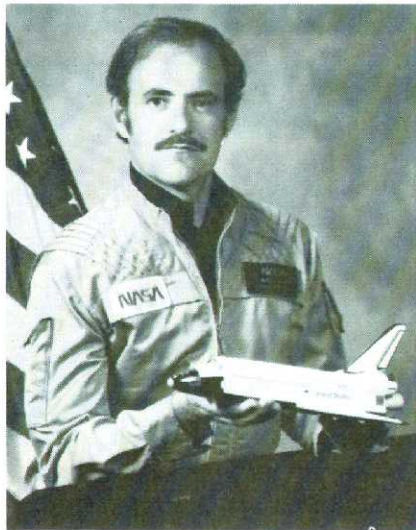
My life's ambition" says John Michael Lounge, "is to be a construction worker."

A worthy goal, certainly, but consider: Mike Lounge was one of nineteen people (of eight thousand who applied) selected for the astronaut program in 1980. Lounge holds six Navy Air Medals, three Navy Commendation Medals, and the JSC Superior Achievement Award. He has a bachelor of science degree in Physics and Mathematics, and a Masters in Astrogeophysics. He is scheduled to fly into space on either the space shuttle Columbia or Challenger for a mission early this year.

Lounge is referring to NASA's goal of building a permanent, manned space station in orbit around the earth, and of his own hopes to be one of its construction engineers. "The space shuttle allows you to build a space station the way it *ought* to be built" says Lounge. "With the shuttle we can carry pieces of the station into space, assemble it there, and end up with a facility that could not be put up there any other way. That is the major reason for having built the space shuttle: so that we can take the next step to the frontier."

While the United States was developing the space shuttle, the Russians sent up a space station a piece at a time by rocket. It has allowed them to keep cosmonauts in space for over 200 days.

Lounge does not underestimate the Russians' accomplishments or capabilities. "If they can keep a person up there full time, they probably will. There are a lot of reasons to do that, in addition to resource management rea-



sons and national security reasons."

Will this lead to deep space dog-fights of the *Star Master* kind?

"Probably not in our lifetime" smiles Lounge. "The radiation involved would wipe out any kind of computer chip that we're depending on. That's the main vulnerability. All the systems that we use in space depend on silicon chips for their control. And if they break down, you have a bunch of junk floating around out there. And there's not much you can do with bailing wire, the way you might fix your car."

Mike Lounge was born in 1946 in Denver, Colorado and grew up in Burlington. After his graduation from the Naval Academy, he spent nine years of active service in the Navy: flight officer training; advanced training as a radar intercept officer in the F-4J Phantom; a nine month Southeast Asia tour aboard the *USS Enterprise* with Fighter Squadron 142, during which he participated in 99

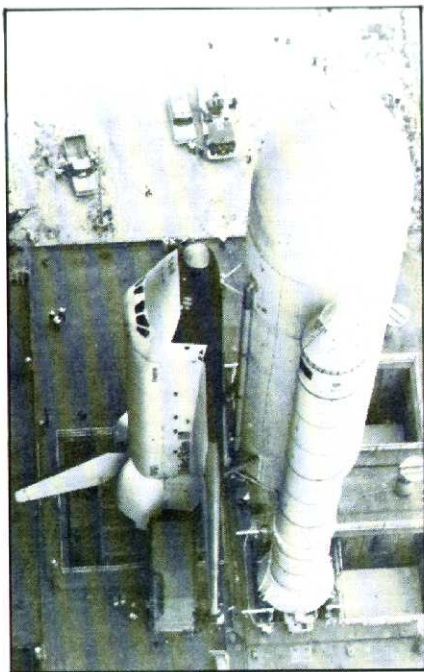
combat missions. He resigned his commission in 1978 to work as an engineer at the Lyndon B. Johnson Space Center.

When Lounge was selected as an astronaut candidate, he underwent a year-long program of training and evaluation before he became eligible for assignment as a mission specialist, someone who concentrates on the mission itself: the payload and its deployment and a space walk, if called for.

Lounge is pleased with the prospects of a space walk, but his enthusiasm is tempered with caution. "Those few that have taken a walk in space have reported a feeling of euphoria. It took a real concentrated effort for them to discipline themselves to the task at hand. It's not a very safe thing to do." Part of the problem is that there is no way to accurately simulate space-walk conditions in training. Computer graphics dish up everything in a shuttle mockup — except that. "The way we train for that" reports Lounge, "is by climbing into a big swimming pool in a space suit that has been modified for water. That's not a very accurate simulation."

In this age of fiscal austerity, NASA has joined with virtually every federal agency in crying poor. But Lounge feels that the problem is more serious than simple underfunding; he feels that the dwindling clout of NASA reflects a crisis in the American spirit.

"In 1961 we made a decision to go to the moon before we had ever put a man in orbit. It was just audacious! Alan Shephard had made his fifteen minute flight, but essentially we had no experience in space and had no



The space shuttle Columbia viewed inside and out. Counterclockwise: the craft attached to its enormous boosters; a closeup glimpse of its powerful thrusters; the craft dwarfing technicians; and pictured with astronauts working at one of its many internal control panels.



idea how we were going to solve all these problems. We just said we were going to do it, and ten years later we landed on the moon. We've lost a good deal of that kind of spirit. Look at the 70's and our decline in leadership in technology in relation to the rest of the world. I think there's a correlation between that decline and the relative stagnancy of the space program in the 70's."

Proponents of the space program are fond of listing the many benefits to civilian life that have sprung directly from NASA's technological achievements. Lounge is aware of those benefits, and proud of them, but he is more interested in the advances yet to be made.

"We need a vital program to stimulate the robotics industry, just as the Apollo program stimulated the computer industry in the 60's. Without that kind of stimulation to the university system and industries, we probably wouldn't be where we are today with computers and miniaturization. The spinoffs have been incredible. The calculator I've got on my wrist cost about \$400 in 1970. I bought this for \$29.95.

Many of our advances in electronics are attributable to space science. Pace-makers, for example, and the kind of technology that allows a patient to go home that would otherwise have to stay in the hospital. These sprung from our development of life support systems that had to be small enough to fit on our backs."

"Communications is also an area that has been greatly enhanced. We're really not far from the Dick Tracy two-way wrist TV. As a matter of fact, it wouldn't be too difficult today to have a TV on your wrist that would receive directly from an existing communication satellite."

No one will deny that NASA has inspired dizzying advances in technology, and so has changed the way we all live, but the joke among officials in the industry is that Atari is five years ahead of NASA in computer technology.

But NASA does not lag far behind Atari in its own field. NASA's space shuttle trainer module uses computer graphics to simulate take-off, landing, and orbiting procedures.

"In terms of the excitement, our

simulator is probably the best videogame I've ever seen" praises Lounge. "I'm not familiar with the programming details, but I imagine the techniques that are used to generate the visuals are very similar to the ones used in the arcade machines."

It is interesting to note that, before computer-generated graphics, NASA employed a system for their trainer-simulator very much like the systems used by John Dykstra and Industrial Light & Magic for such films as *Star Wars*.

"They would build a twenty-by-twenty foot board" reports Lounge, "and, in exquisite detail, construct a miniature model of whatever scene they wanted to use, such as a miniature airport or a simulated Andrews Air Force Base. Then they employed a camera, mounted on a device that would allow it to move anywhere on the board, and shoot the scene from any angle. That camera was controlled by commands from the simulator, and relayed the images back to the trainee."

Trainer-simulators aside, what does Mike Lounge, space shuttle astronaut, think of the videogame craze?

"There are a lot of articles written to the effect that children spend too much time on videogames, that they lose touch with reality. I can't say whether that's true or not. I don't allow my child to do that. I think that they're a very worthwhile recreational device in the following sense: there's no way we can cope with the world we have today and ignore computers. And if videogames help our children accept that, be more comfortable around computers, stimulate curiosity about them and how they work, then it will help them in their life. Anything we can do for our children that will encourage that adjustment is beneficial."

"There are a lot of people that are scared to death of computers, and I think they're going to have a rough time, because they can't avoid them. But people went through the same thing when Henry Ford invented his fancy new machine. I imagine there were people that were terrified of it, that refused to try to understand how there could be an internal combustion system. Today there aren't many people that are afraid of automobiles. They don't understand any better than the people a long time ago how the internal combustion system works, they

just use it. Computers are the same way. Computers don't require that everyone understand how to program. The basics of a computer haven't changed. We've known how to build them for a couple of hundred years."

Whoa, Mike! A couple of *hundred* years?

"The first computers were mechanical machines. Slide rules. The abacus. Mechanical adding machines. Conceptually, a computer is merely an instrument of data storage. The first electronic machines that were

built in the 1940s took the equivalent amount of space of a three bedroom house to store, and they wouldn't do very much. They would add, subtract, divide, and multiply. But we made progress, not because we discovered how to compute and program, but because we figured out how to build the machinery smaller and lighter for greater data storage and faster computation."

If Mike Lounge is enthusiastic about computers, one reason may be that computers made the space shuttle possible. "It could not fly

without computers," he says. "The computers tell you where you are and how fast you're going and what to do with the controls and rocket motors. There's no way that a person could gather enough information or process it fast enough to solve those problems."

Lounge is enthusiastic about the space shuttle, proud of his country's accomplishments.

To explore the frontier. To be a construction worker among the stars—paving an unimagined course. It's videogames. . .for real.



CONQUERING

Continued from page 74

the left until it is in the path of rock #1. Proceed to move down to point A and then stop and inflate the Fygar. When the Fygar is fully inflated, run through it down to point B. At this point you must stop, turn around, and reinflate the Fygar without blowing it up.

A Pooka will be coming straight at you from above the inflated Fygar. It is necessary to quickly inflate the oncoming Pooka and run upwards through the monsters and toward point C. Upon reaching point C move to the left and drop the rock on the monsters.

On Round Two, move Dig-Dug one notch to the right and then down to point A. Here, you should inflate the Pooka and run through it to proceed to point C.

At this time, move back toward point B and inflate any monsters that come near you. Do not blow them up. Now it's time to proceed toward rock #1.

You may also have to inflate a monster in order to head straight up to rock #1.

You will find that this pattern will usually kill all the screen's monsters under one rock.

On round three, move Dig-Dug down to point A. There, you must inflate the monster and run through it while heading downward. When you reach the

bottom of the board, turn left and head up to point B. There you must inflate another monster and proceed to rock #1. At this time, drop the rock on all the pursuing monsters.

A very important part of all these patterns involves the technique of stalling the monsters by inflating those that get in your way.

On round four, move your figure to the right, proceeding down when you are in line with rock #1. At point A you should inflate a Pooka and then start upward. Remember to stall for as long as possible before dropping the rock, which will allow you to kill all the monsters under one rock.

On round five, move your figure one notch to the left and proceed down into the Fygars' cage as shown in the diagram. When you run head-on toward the Fygar, pump it twice and run through the creature to proceed with the pattern.

At point A it will become necessary to back up slightly, then pump and run through a Fygar before reaching rock #1

It is common to kill all but one monster under this rock, which will leave enough time to drop a second rock and reach your bonus Vegetable.

On round six, move Dig-Dug one notch to the left and then turn down to point A. Here, you must stop and inflate the monster so you may pass through it. Turn to the right and go to the end of

the monsters' cage where you must turn down to dig a trench to the bottom of the screen.

At this point turn around and ascend to rock #1.

Try to stall as much as possible on the way up to the rock. When you reach the rock, move to the right in order to keep all the monsters in the path of the falling rock.

Conclusion

It takes a little practice to develop the skill of effectively manipulating your little figure through the ground. One way to gain an understanding of the machine's joystick and pump button is to try and fight off two or three Pookas coming straight at you. If you practice stabbing back and then running forward, you will soon be able to fight several monsters at one time.

When you have developed good patterns and use the techniques described in this article, you will easily conquer even your own high scores on *Dig-Dug*. If not — hop on back to *Kangaroo*. □



THE EXIDY EXPERIMENT

Portrait of a Feisty and Futuristic Independent

By Richard Meyers

In a business dominated by conglomerates, the existence of a small independent is unusual. But when that independent happens to be one of the prime movers in its industry, there has to be something special about it.

This is true of Exidy Inc. And the producers of *Pepper II*, *Mouse Trap*, *Venture*, and other games are working as hard as they can to stay small.

"We are a privately held company," says President Pete Kauffman, "and with good reason. Sales and expansion are nice to have, but to give up control and flexibility isn't worth it. We can have more fun making games *our* way than we could otherwise. As long as we keep our internal controls, we'll get only as big as we have to."

Director of Market Analysis Arlen Grainger quietly agrees. "Not only are we small, we're the only small company that does its own research and development. We don't go to Japan for licenses or new products, we rely on in-house talent." Grainger adds, "Our small size also makes it possible to respond immediately to changes in the market,

right down to making modifications or advancements on models we're about to ship. The fact that we've been around for eleven years is attributable to our ability to capture the vital, inventive people required to keep a small operation alive."

Exidy has had remarkable success capturing a vital percentage of arcade players as well. They did this, in the beginning, with innovative games like *Video Pinball*, *Robot Bowl*, *Circus*, and *Tailgunner 2*. However, their biggest success of the early years was with the controversial *Death Race*, a followup to their *Destruction Derby* romp.

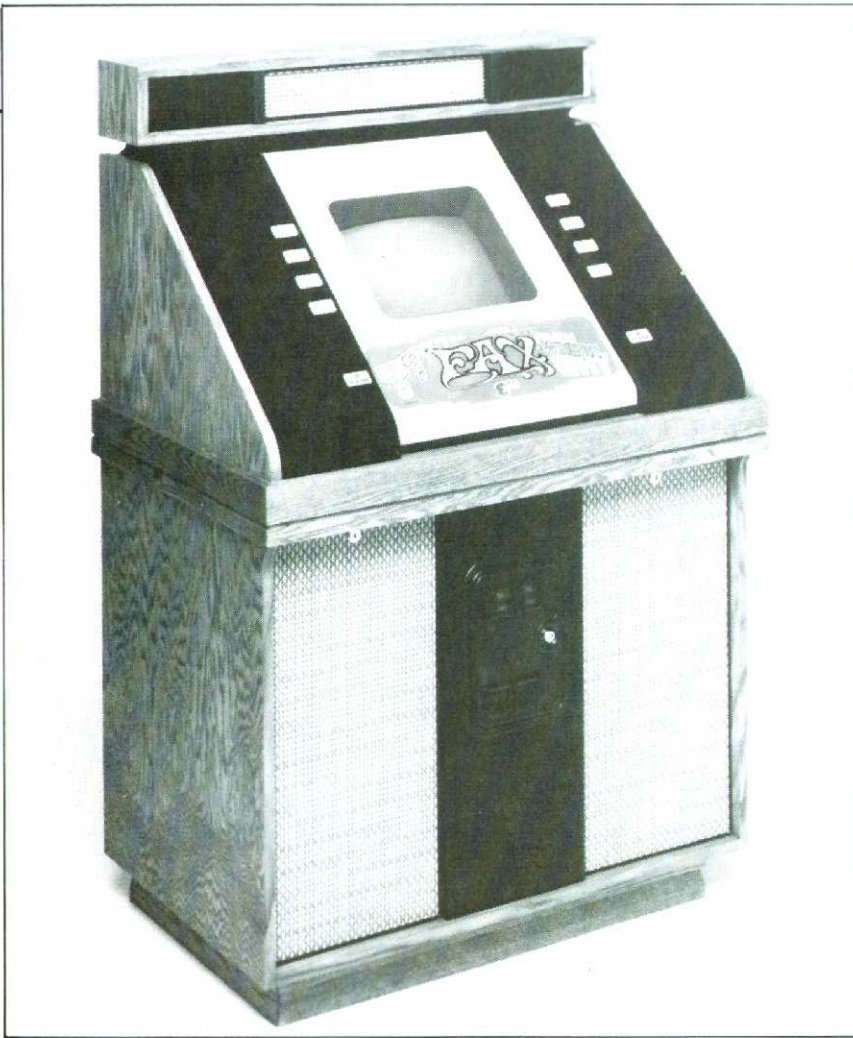
The object of both games was to run things over with your video car. In *Death Race*, the quarry was people.

"It sold a lot of units because of the controversy," Grainger recalls, "but we all thought it was kind of laughable. It was so cartoony we never thought anyone would take it seriously."

Exidy took pains to refer to the figures as "Gremlins," but the dark humor came through in gameplay where, when the player mowed down a pedestrian, it would change

into a cross-marked grave. Gremlin or not, *Death Race* remains the Rabelais of videogaming. Luckily for Exidy's corporate image, *Death Race* wasn't the only high point of their early history. *Star Fire* was one of the first space war games, as well as one of the first sit-down units. More recently the company produced *Targ*, a novel grid-race game in which players try to outrun ominous Spectar rammobiles, and the treasure hunt *Venture*. All of these games offered players something new in gameplay or hardware, reflecting Kaufman's bias toward innovation. His ambitions for the field are evident in the choice of a name for his company: EXcellence In DYnamics.

"It's easy to say that you're going to make the finest games in the field," he admits, "but we've been able to pursue that goal. I think the best way to do that is by establishing the right working conditions for our staff. We challenge our people, of course. But apart from our employees enjoying the work itself, one of the things we do is hold in-house contests to brainstorm new games. There are cash rewards



"It's easy to say that you're going to make the finest games in the field," says Exidy President Pete Kauffman, "but we've been able to pursue that goal." Certainly, Fax is in a class by itself among arcade games, the last computerized quiz game in a sea of slide-and-shoots. It has recently been released for home use, in Apple-compatible format. Hard Hat is a game with an educational bent; to date, players have found it less than riveting.

for creators, money which is often greater than an employee's salary.

"Another program we have is to set aside 'X' number of dollars per game, money which goes into a profit sharing plan to be divided up among the employees." He notes with great satisfaction, "That's one reason we've got people who come to work in the morning and stay until midnight. It's the reason a small company like ours can get a lot done in a short period of time."

Because the company is preoccupied with trailblazing, one is initially surprised to find their much-ballyhooed *Pepper 2* something of a *Pac-Man* variation. There is, however, a good reason for the similarity. Grainger, who was one of the originators of the attraction, walks us through a game.

"Let's begin by noting that it's different from any other game in that you play on the maze rather than inside the walls," he explains. "As your character, a little fellow with a

halo, passes over the path, it's zipped up. If you cross any section you've already traversed, you unzip it. All the while, there are 'Evil Eyes' and a 'Whipper Snapper' chasing you and unzipping your handiwork.

"Then there's the aggressor mode," Grainger continues. "There are territories marked by a pitchfork with a halo around it. If you reach them, you enter an energized state. Your own halo is replaced by horns and the hunted becomes the hunter."

Grainger defends the superficial resemblance to *Pac-Man* by stating that, "Videogames are a technological extension of the human. By responding to what colors, sights, patterns, and sounds affect players, we can begin to make games that will, in essence, *force* people to have fun. Where we adapt some of those qualities, it's only to expand upon them in our own games." He laughs in response to a query about this process being



akin to mind control. "No," he assures *VCI*, "it's all part of a very complicated theory of learning, one which involves sensory input as the key to making one's body and mind work in unison."

Kauffman elaborates. "All good games have some sort of biofeed-

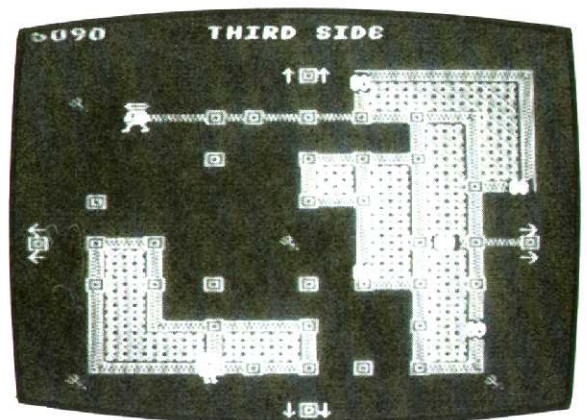
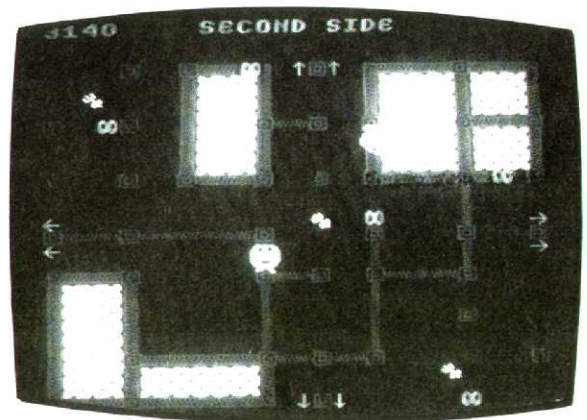
back. We simply shape that, and in the projects we're preparing for the future you won't find anything resembling a 'me too' game."

In terms of the future, Kauffman sees the industry headed in several fascinating directions. "It's going to remain a fairly large industry,

though I see it going through a leveling-out period. So many people jumped in, unprepared, and they're dying out now. Looking ahead a few years solely in terms of technology, there might be electromechanical, 3-D, or more interactive games in the future—in other words, hardware to support the fresh and original ideas which the best of the companies will continue to produce."

"What an arcade game will be," Grainger asserts, "is like dropping into your favorite cartoon. You'll be able to participate more fully and feel more acutely any and all effort, achievement, and reward. It's going to be an extraordinary experience."

Exidy's headquarters in California may be surrounded by the over four dozen buildings which house Atari's operation, but Kauffman's small company is pushing as hard as any to see that the limits of videogame technology are tested to their utmost. Above all, he insists, "I'm convinced that as long as videogame creators have as much fun originating games as others do playing them, there is *no* limit to what the field can do." □



YOU READ IT HERE FIRST!

Suffering and anxiety ... that's what videogames have been about since the craze began. Desperate missions in space, frantic maze chases, the rescue of one in peril, the crossing of a busy thoroughfare.

All well and good ... but who knows more about suffering than artists? And who knows more about great suffering than great artists?

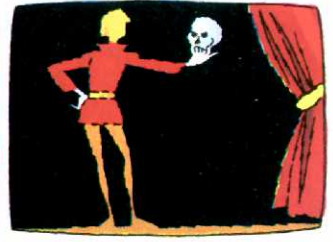
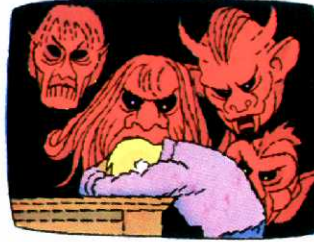
The designers of today's videogames should not forget those who virtually trained our ears to accept western music,

those who defined our aesthetic in form and color, or those who created in literature the very conflicts that serve as the basis of today's games.

We haven't forgotten, and that's why we propose these games to America's designers.

Once again, we've come up with twenty game ideas, submitted them to videogame players across the nation, and asked them to vote on their favorites.

The results are published for your amusement.



EAR TO THE GROUND

You are Vincent Van Gogh, and you must finish six paintings before you go blind or lose all your limbs.

Protected only by your kindly brother, you move across a primitive cityscape to reach peasant cottages or country landscapes. Once there, your Vincent-figure dashes across a canvas, emblazoning it with bold color.

But beware! You are being pursued by creditors and asylum marshals. Each time you are thrown into the sanitarium or debtor's prison, you lose one limb, which makes it more difficult to cope in the city.

Time is also a factor, for as the game continues you gradually lose your eyesight, your paintings become increasingly more bizarre, and even your brother will abandon you.

ACCELERANDO

Also known as the Beethoven game, a contest in which sound is as important as sight and reflex. Using sonic cues, the player must capture notes which zoom across the screen at an ever-increasing speed. The notes must be arranged to form a toccata and fugue.

Difficulties ensue as the sonic cues become increasingly dimmer and are drowned out and confused by those of squalling babies, nagging wives and gossiping servants. Eventually, all sonic cues cease and the toccata and fugue must be completed by memory selection and patterning the notes after the first stanzas.

EMILY ATTACK!

A two-player game. One player takes the role of a painfully shy and reclusive poetess. The other limns the role of an insensitive and loutish literary agent who leads an army of dilettantes, sycophants, and hacks on a siege of the poetess' country cottage.

The two-story cottage contains six windows, two doors and a revolving secret hatchway which must be sealed with chairs, boards and mute pleas. If the cottage is successfully breached, the unfortunate poetess becomes catatonic and the agent is rewarded with fleeting fame.

KUBLAI KHAN

A two-player game that takes place in the mind of an opium-crazed poet.

Player one must move stanzas from the left of the screen to the right and there to assemble them in order. Player two controls the poet's hallucinations, which distract as well as inspire his opponent.

For each stanza that player one escorts from left to right, he uncorks more hallucinations. These fever dreams he must fight off, order, and stuff between the lines of his stanzas. Player two, meanwhile, harries player one and puts his stanzas out of order.

If enough hallucinations are allowed to accumulate outside the poem, no more stanzas can be moved. A pesky neighbor then pounds on the door, the poet awakens, and the game is over.

WHISTLER'S MOTHER

You are painting a portrait of your cranky old mother, but she won't sit still. The object of this game is to finish her portrait before your allotment of light intervals is depleted.

During each interval, the player splashes color on a canvas with his/her joystick, while monitoring mother in the main screen.

Distractions for the errant mother-figure include tea, cushions for her rocker, her afternoon constitutional, and repeated trips to the loo. You must complete these errands for her or accompany her to the loo in the brief moments when the light is imperfect, or start over again.

The game ends when either the mother is put into a home, you run out of paint, or you successfully complete the portrait. Difficulty escalates as mother grows more senile.

TOTE THAT BARD!

A maze game. You are William Shakespeare proudly bringing your latest play to the Globe theater. Dogging your trail are Marlowe and Jonson figures who want to steal your play and take the credit for it.

You consume experiences and become enriched as you run the maze ... or if you're not quick the experiences will whip around and consume you! These include sexual conquests, betrayals, fits of jealousy, doubt, and overweening pride.

Get that play to the Globe or remain a lowly actor! □

On this page, we present an assortment of some of our favorite proposed videogames from our earliest issues. A few of the ideas listed below have, in varying degrees of alteration, actually *become* videogames since we first published them; the best-versed videophiles in the audience should easily be able to spot them. Just remember that...

YOU READ IT HERE FIRST

There Goes \$79.95

A slice of life game.

You've rented a videocassette of the hottest movie around—and your tape machine has decided to chew it up.

The screen looks down at the mess of tape threaded through the tape player's inner mechanisms. Each time you start the game, the tangle has taken a different course. Your job, Mr. Phelps: use the cursor to release gears and switches and get the tape out, unbroken.

A new length of tape is thrust into the machine every sixty seconds. After ten minutes, you're buying the ruined cassette.

Cinema 1, 2, 3

How good a projectionist are you?

You're up in the booth of the latest mini-theater, where you're responsible for running three movies simultaneously.

The view is looking into the projection booth, a cone of light spilling from the projection as the first movie flickers toward its tiny screen. You load the reel onto the second, start it, and move to the third.

By that time, the first reel needs changing and—uh oh! The film has broken on reel three! A timer appears at the bottom of the screen. You've got ten seconds to finish it with reel one and splice three before the broken film hits the film gate.

That's when the bulb starts to flicker on projector number two. And the sound threatens to go off on reel three.

Different problems offer different point values, adding to your score if you repair the breakdown in time, detracting from your score if you fail.

The game ends when tomatoes start flying from the audience.

Santa Claus

Saint Nick is coming to town, though not as he would like. Rudolph and his team have been indulging in a bit too much grog with the elves at the North Pole and, as a result, he races from side to side of the screen at erratic speeds. Your job, as Santa, is to fling bags of toys at the rooftops below, trying to plant them squarely in the chimneys. The action button releases the bundles of happiness, the joystick helps you to compensate somewhat for speed (left, right) and height (up, down). Ho, ho, ho!



Dune

As in the Frank Herbert novels, you are a Freman mining for Melange in the desert. Suddenly, a thousand-foot-long Sandworm comes slithering in your direction. Your associates scatter, leaving you to battle the monster yourself. Somewhere in the desert it is raining, which will prove fatal to the monster. The trick is to survive long enough to lead the worm to the storm. Scattered about the sands are electric weapons which will slow the beast, atomic weapons which can destroy one of its rings per weapon, and smaller worms which will do battle on your behalf. The trick is to get to these artifacts using a radar scanner above the main screen.

Frosty

Your job is to finish building Fros-

ty before time slips away.

Decked out in mittens and snow-suit, your video figure must roll three big balls of snow and, climbing onto a milk crate, stack them one atop the other. That accomplished, you must finish your snow-person by adding charcoal features and a stovepipe hat.

But wait! The sun is rising higher on the horizon, melting the snow. And every now and then, the neighborhood bully sprays your egg crate with a hose. The water freezes, making it too slippery to climb.

The only way to keep your nemesis away is by pelting the turkey with snowballs—though that lessens your supply and makes the task of completing Frosty that much more difficult.

John Henry

You are the legendary American railroad worker, pitting your muscles against a machine. In each hand is a mallet: you must pound in spikes faster than the steam-powered hammer on the other track. You must beat the machine to various junctures where the tracks merge. If it is ahead of you, you can't hammer any spikes and the machine gets all the points. However, if you go too fast you are liable to miss spikes. The tracks pass through dark tunnels and up hills, which make visibility a problem and cause you to slow down, respectively.

B.C.

A prehistoric race game based on the comic strip.

B.C., on his unicycle, must race through various obstacles to reach Wiley's Bar. The impasses include a slow-moving dinosaur, army ants which constantly chew up and narrow the road, the fierce Hurricane Zelda, and road-hogging Dookey Birds.

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