Beta Breakthrough!

VIDEO

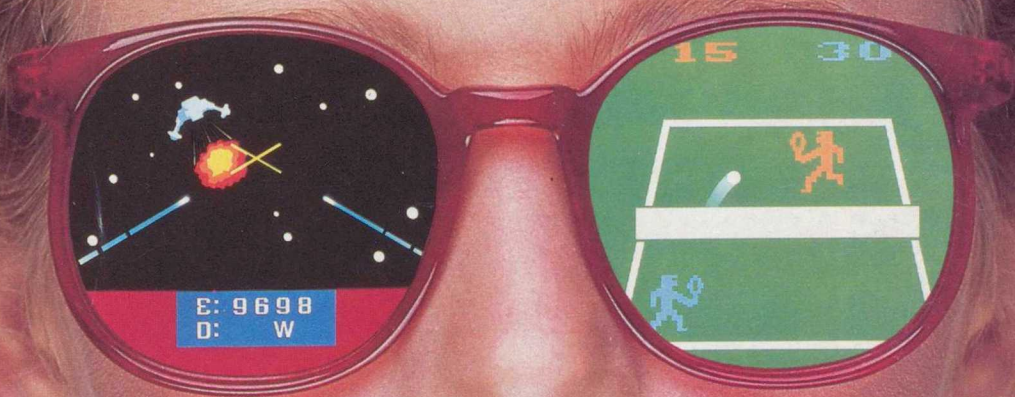The #1 Magazine of Home Video

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Arcade Alley

A Critical Look at Video Games

by Bill Kunkel & Arnie Katz

Beyond Science Fiction—A New Breed of Games

According to the "word on the street" here on "Arcade Alley," it is even possible to get too many hot-fudge sundaes. The year about to end represents the high-water mark of the five-year trend toward science-fiction game themes. By January 1, more than 50 video-game cartridges and up to twice that many computer software programs will be available to space-happy gamers.

The reliance on SF concepts is easy to understand. After all, the synergy between the movie *Star Wars* and the coin-op video game "Space Invaders" had a lot to do with launching the current boom in video-gaming. But now the more alert manufacturers realize that even this seemingly boundless enthusiasm for SF must have some limitation. Companies afraid of becoming the publisher of that profit-killing "one space shootout too many" are encouraging designers to widen their horizons.

Are science fiction games *kaput*? Hardly. There'll be plenty more during the coming year. What we expect to change is their dominance among new releases. Some producers have already introduced several games which, while full of action and excitement, couldn't be further re-moved from the prevailing run of futuristic cartridges. Let's examine three of the newest for use with the Atari VCS (or Sears Tele-Arcade) systems.

Although **Frogger** (Parker Brothers/Atari VCS) never generated the hoopla that "Pac-Man" did in commercial amusement centers, most players have admired its hippityhoppity play-action and charming audiovisual presentation. In light of the mediocre translations that have surfaced in the VCS software market of late, it is refreshing to report that Parker Brothers' designers have conveyed "Frogger" with most of its principal elements firmly intact. The cartridge over-comes the obstacle of the VCS's 4K memory to offer the sights, sounds, and easygoing fun of the original.

The only glaring divergence from the coin-op version is that when the frog is riding a log during its journey across the river, it is possible to scroll off one edge of the screen and reappear safe and sound on the opposite side. The arcade quarter-sucker kills your acrobatic am-phibian when this occurs. This makes the home version easier since the frogger can take several rides past the five landing bays at the top of the screen before at-tempting to jump into one. In the coin-op, the bay at the extreme lefthand edge of the screen can be mighty hard to hit. Those who prefer a perfect copy of the coin-op original, minus the scrolling, need only flip the difficulty switch to the tougher setting.

In the VCS edition, one or two players use joysticks to jump an on-screen frog from lane to lane across a highway, over the center divider, and then across a river into one of the bays. Each time a gamer fills all five bays with frogs, the game au-tomatically moves to a higher level of dif-ficulty at which the frog must avoid denser traffic and cross the river with the aid of sparser floating debris. The six game vari-ations, split between one- and two-player contests, embody three strata of difficulty.

"Frogger" will make fans of its com-mercial counterpart jump for joy.

Towering Inferno (U.S. Games/Atari VCS) achieves a respectable level of ex-citement without having a shot fired in anger. The arcader takes the role of a firefighter who has been dropping by helicopter onto the roof of a burning sky-scraper. The blaze-buster must work his way through the building floor by floor, dousing flames and working against the clock to save residents from a scorching. At times the firefighter simply dodges the dancing flames, but he can also confront them directly with his water hose. Pushing the action button fires a jet of H_2O toward the top or bottom of the playfield, de-pending on which way the on-screen fig-ure points.

The easier difficulty settings leave flames visible on the screen even when they are raging inside the walls (where they cannot be doused, incidentally). The harder version keeps the conflagration out of sight unless it's actually flaring up in the rooms or hallways of the building. Though each floor is a little harder to clear than the last, "Towering Inferno" may be a little too patterned and repetitive for some. Of course, so are "Space Invaders" and "Pac-Man." An above-average, enjoyable cartridge, "Towering Inferno" is a re-freshing change from shoot-shoot-shoot.
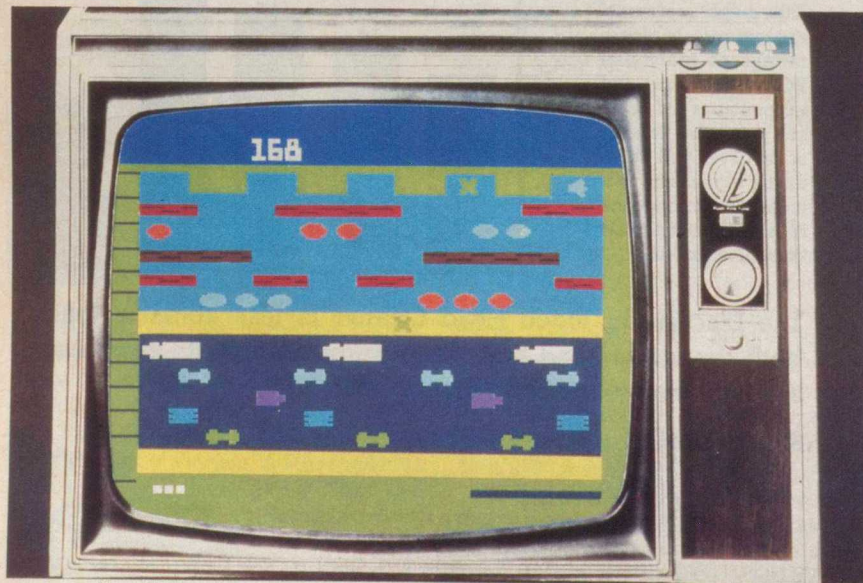
New VCS games include 'Frogger,' transferred in virtually all of its glory.

Lost Luggage (Games by Apollo/Atari VCS) proves that it takes more than a cute concept and a dash of humor to make a top-flight cartridge. While this close relative of Activision's "Kaboom" is moderately entertaining, its play routine is not complex enough to captivate players.

Ever watched baggage tumble off one of those airport conveyor belts? That's the premise. You're a skycap who must roam the essentially featureless screen and catch the bags as they fall. Occasionally, a terrorist satchel pops off the conveyer; if it reaches the bottom of the screen, the round ends immediately. Movement in this solitaire contest is accomplished using the joystick, which is the single biggest difference between "Lost Luggage" and "Kaboom!" There are many other smaller distinctions too, but the two cartridges are in the same genre.

The game has some incredibly cute touches. For instance, a plane taxis up to the luggage conveyor before each wave of bags descends upon the harried skycap, and bags that reach the bottom of the screen burst open to reveal various items of clothing. Yet Apollo might have been wiser to scrimp on the frills in favor of putting some obstacles and barriers on the playfield to impede the skycap's efforts to catch all the bags. This would have added an exciting—and unpredictable—strategic element to a game in need of such fortification.

This is not to say that "Lost Luggage" is bad or unplayable—far from it. It is a decent and somewhat interesting game that just fails to fulfill all of its potential. **V**

DAVIDALLEN 82

An Entertainment Phenomenon

If you're suddenly seeing those beeping, strobing video games everywhere you go, relax. You are not hallucinating. They *are* just about everywhere these days.

People spent more money and time on video games in 1982 than on movies and phonograph records combined. And that doesn't include the more than *20 billion* quarters that players have fed into the slots of coin-operated video-game machines over the same 12-month period.

Even commercial television is starting to feel the competitive heat. After all, when the family is enjoying "Pac-Man" or "Defender," they can't very well be watching TV shows. Hook-to-the-set video games are starting to eat up so much time that would otherwise go to TV watching that some rating services are actually trying to figure an audience share for video games versus broadcast shows.

The most remarkable thing is that

electronic gaming, now this nation's fastest-growing hobby, was born only a decade ago. Although more than 25 million Americans regularly enjoy some form of electronic gaming, only a handful of pioneers had the courage to try the new pastime when it first appeared in 1972.

As with such other notable American inventions as baseball and rock & roll, the origins of electronic gaming are shrouded in conjecture and mystery. Thanks to the ripening of computer technology, so much simultaneous independent investigation went on that it is almost impossible to single out one "father of video gaming."

One of the likeliest candidates, however, is Nolan Bushnell. This computerist-turned-game-designer found there was no interest in his attempts to make use of video and computer technology at Bally Manufacturing Company, the coin-op pinball-machine

maker, so he forged ahead on his own. Working in the garage of his California home, Bushnell put together several prototype machines for a video-tennis game he called "Pong." Although the games Bushnell tried on Bally made excellent use of state-of-the-art computer science, the company felt they were too complex for arcaders of the day. So when Bushnell created a game machine using his own money, he decided to keep everything as simple as possible.

A couple of days after Bushnell had placed a "Pong" unit in a nearby bar, he got a frantic call from the proprietor. The machine, it seemed, had suddenly quit cold. When Bushnell dropped around for a service call he found that the problem, to his delight, was that the coin slot was choked with money. Buoyed by this, Bushnell soon founded the company known as Atari, today the biggest name in video games.

While Bushnell pursued the coin-op market, Magnavox was preparing to enter the home market with its Odyssey programmable video game. (Typical of the confusion surrounding the invention of video games is that Bushnell paid royalties to Magnavox's Ralph Baer for the

VIDEO's Guide to Electronic Games

by Arnie Katz, Bill Kunkel, & the editors of Electronic Games Magazine

video-tennis design.) Odyssey was ahead of its time. Not only was the available technology a bit primitive for what the Magnavox design team had in mind, but many consumers did not understand the idea enough to be interested. Further hampered by the company's distribution setup, Odyssey never quite caught on with the public, at least at first.

Skipping past the parade of increasingly sophisticated "Pong"-derived home and commercial video games brings us to that landmark year, 1978. In Japan, Taito invented "Space Invaders," the first of the great coin-op hits. Meanwhile, Atari and Magnavox got the infant hobby rolling by bringing out programmable home video-game systems selling for under $200.

Since then, video games have gone from strength to strength. There are now four major home systems—Atari VCS, N.A.P. Odyssey², Astrocade, and Mattel's Intellivision—with three more scheduled to make their debuts this holiday season. It is estimated that Americans will buy more than seven million video-game consoles this year plus more than 60 million game cartridges to play them on. Though virtually everyone agrees that true

computers will eventually crowd the less flexible and more limited video games out of the nation's living-rooms, it is likely that more than half of all American families will have such space-age games connected to their TV sets before this comes to pass.

The popularity of video games is no accident. They are both physically and mentally stimulating. Video games have such a marked effect on hand-eye coordination, some therapists are using them in work with handicapped and dyslexic people (see "Putting Video Games to Work," page 58). The mental enrichment derived from the games may be less obvious, but it's no less real. Having the lightning speed of base-stealer Ricky Henderson or running back Tony Dorsett is not enough to score well at most video games. Players must hone their ability to analyze the rapidly shifting situation of the screen and just as quickly formulate sometimes intricate strategies to handle problems as they crop up.

A big part of video games' appeal is that they are intensely interactive. You can't just sit back and watch, as with television. Constant participation is necessary to keep the game going. This leads to a high

degree of involvement, which goes far to explain why electronic arcaders are so unshakably enthusiastic about their favorite hobby.

Then, too, video games are a sneaky way to help people overcome computer phobia or, with younger players, prevent it. Electronic gamers do not quake in their boots at the thought of a world in which computers play a major role. Since they approach the machines in a nonpressurized friendly context, the bogeyman myths surrounding computers never get a chance to take root.

There are plenty of additional high-sounding reasons for the popularity of video games, but they all boil down to one big reason: they're fun. They are quick to learn, hard to master, and thrilling to play.

And if you want to get in on the fun, this section will point you in the right direction. Beginning on the next page is VIDEO's complete guide to what's available in home video games right now, and six months down the road. While the only way to buy a video game is to sample the games for each system to see which best fit your desires, this special section provides a framework for your search for the right system.

The Four Major Systems

Four major home video game systems are sold in this country. In order of current popularity, they are: Atari VCS (Atari), Intellivision (Mattel), Odyssey² (North American Philips), and Astrocade (Astrocade). A fifth system, the Channel F II, is an attempt to revive a machine developed and dropped by Fairchild Electronics, but it is only sold through the mail by Zircon.

The systems can be divided into two main classes. Standard programmables such as the VCS and Odyssey² have up to 4K of ROM (permanent memory), feature low-resolution graphics, and cost under $200. The senior systems boast more than 4K of memory, high-resolution graphics, and steeper prices.

Selecting the right machine from among these four—not to mention the four others that have only just reached stores and will be described later in this section—is no easy task. Our best advice is to study all systems before deciding on one. Then closely study the games available for each of your leading choices. Pick the system that offers the greatest number of cartridges you find enjoyable to play and the chances are good that you will have selected the best video game machine for your needs.

You can kick about its clunky graphics and call it technologically obsolete, but the Atari VCS remains far and away the most popular of all the home video-game systems. Close to four out of every five home arcades sold carry the Atari brand.

The biggest reason for this unit's success is that Atari realized early that the easiest way to sell a system is by producing lots of good games for it. Thus VCS owners have always had the greatest choice of titles. The company's library now runs to over 50 programs, while independent software producers such as Activision, Imagic, Games by Apollo, U.S. Games, Commavid, and Parker Brothers have produced perhaps 100 more.

The rugged construction of the console makes up for its lack of futuristic styling. The VCS may not be the prettiest machine to look at, but it is built to weather many hours of impassioned play. The heavy-duty plastic housing can withstand a lot of hard knocks. All functions are directed from two-position slide switches. Those controlling off/on, color/black & white, game select, and game reset are arrayed across the front panel. Difficulty switches were originally placed there too, but were moved to the back panel of the VCS near
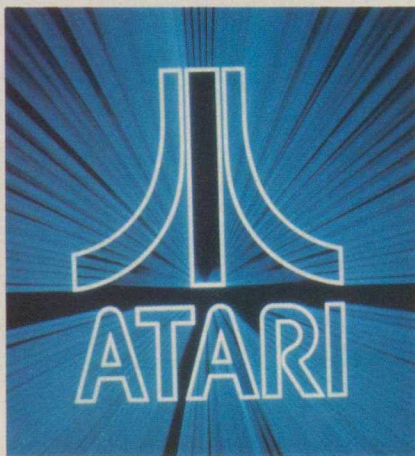
the two controller ports in the revised 2600A model.

The VCS comes with two sets of controllers, joysticks, and paddles packed with the machine. In addition, keypad controllers can be purchased separately to play games like "Star Raiders," and "Indy 500" is packaged with its own custom control device. The ability to switch controllers in an instant gives the VCS more versatility than other machines which must use the same command device for all games.

Visuals rate as this system's biggest weakness. The relatively low power of the VCS precludes anything more than the simplest drawings on the display screen and also causes a disturbing flickering when a program attempts to move too many objects around the screen at the same time.

The recently introduced Supercharger by Arcadia offers some relief. By greatly boosting screen random-access memory (RAM), it enables the Atari VCS to create graphics that rival those of the more expensive senior programmables. The Supercharger plugs into the cartridge slot and is then connected to an ordinary audio-tape recorder. Arcadia, and presumably other suppliers, will offer VCS games on tape for a list price of only $15. The Supercharger plus a game will sell for about $70.

Another point in the VCS's favor is that Atari maintains a pretty decent service network and that minor spare parts such as the RF modulator, joysticks, and AC adapter are readily available in discount and department stores. Nothing is more important to a true electronic gamer than a quick fix when his or her system breaks down.

"The Keyboard is the key" is the current advertising slogan for this machine. Unlike many commercial catchphrases, this one is surprisingly accurate. It is the Odyssey²'s monoplanar keyboard that most clearly distinguishes this standard programmable video-game system from its most direct rival, the VCS.

The Odyssey² (or O²) console is relatively simple. It features a front-mounted on/off button and a pair of internally connected joysticks. (Older O² models have

the same sticks connected via plugs in the manner of the VCS, though the controllers for the two systems are not compatible.) Such factors as difficulty level, game variation, and number of players are input to the system using the keyboard, eliminating the need for a lot of extra switches. The controllers work exceedingly well, almost on a par with the VCS joystick. They are somewhat more fragile, however, and more enthusiastic players may find mechanical breakdown in the stick a nagging problem.

Although the Odyssey² game library is not as extensive as those of some other video games, it is unusually varied. There are fine two-player sports simulations like "Baseball!," arcade raveups such as "UFO," and more thought-provoking contests such as the Master Strategy Series. The latter represents one of Odyssey²'s major innovations. It's a series of board-/video-game hybrids that use clever keyboard overlays to allow players to issue a wide variety of commands with relative ease.

The absence of paddles can prove frustrating at times. Games such as "Blockout/Breakdown" don't quite work when a joystick must be substituted for the more appropriate radial control knob.

It should be mentioned that not many new games are appearing for the Odyssey². N.A.P. can be counted on for six to eight new titles a year, but third-party software publishers have been slow in creating games for the system. Now that the number of O² owners is approaching the one-million mark, look for some activity. Imagic has already announced it will make an O² version of "Demon Attack"—a good sign.

INTELLIVISION

The success of the Intellivision is reminiscent of one of those fluke touchdowns that sometimes occur on the gridiron, the kind of play in which the defensive back intercepts a pass only to bobble it back into the hands of the original intended receiver. Mattel intended its game console, introduced in 1980, as the first module of a multicomponent personal-computer system. Unfortunately, Mattel has failed to put any other components into general distribution since then, though the keyboard continues in its test market. (One peripheral that will actually reach market soon is the Intellivoice, a voice synthesis module that adds the power of speech to certain special cartridges.)

Most owners of the Master Component probably don't mind all that much, since Intellivision has turned out to be an excellent video-game console. This senior programmable system brought top-flight graphics to video gaming for the first time, and its graphics are still without peer among the four major systems in this regard. As George Plimpton never tires of pointing out in its commercials, Intellivision games almost always look better

than competitors' equivalents.

Of course, looks aren't everything. Slow on-screen movement speed has hurt several Intellivision titles, especially those that attempt to provide arcade-style action. Movement is, however, more than sufficient for the sports simulations, which are certainly the finest ever produced in video-game form.

The Intellivision console is sleekly attractive, the best-looking unit of the "big four." The controllers are held in special niches located on the top of the Master Component. Also mounted on top are the on/off slide switch and a game-reset button.

The controllers, wired into the console with spiral telephone cords, are either a

strength or a weakness depending on who's doing the judging. Those who especially like action games perpetually complain that the direction disk is simply no replacement for the good old joystick. Strategy and sports game fans, on the other hand, champion this command device because it allows a lot of varied player input through the touchpad. Each Intellivision cartridge comes with a pair of mylar overlays which slip into slots on the controllers and inform players of the significance of each touch position for the game in use. It should be noted that at least two companies are preparing to market easy-to-use kits which convert the direction disk into a joystick on a Mattel controller.

ASTROCADE

Once known as the Bally Professional Arcade, this senior programmable video-game system reached store shelves before either the Atari VCS or N.A.P Odyssey². The combination of a premium price ($299 list) and Bally's lack of experience in selling to home users proved to be temporarily insurmountable obstacles.

Bally shelved the system and went back to concentrating on the coin-op field. A new company, now known as Astrocade, purchased the rights to the system and its games and has made a strong effort to revive it over the last year. The manufacturer is designing new games, getting ready to introduce the improved ZGrass

keyboard, and generally trying to revitalize the Astrocade.

The Astrocade has many features of a small computer. The most important is full user programmability through its alphanumeric keypad and the separately available Astro BASIC programming cartridge. An interface, also sold separately, lets the operator connect the Astrocade to a standard audio-tape recorder. With this setup it's cheap and easy to record your own programs or feed ones others have created into the machine from an ordinary audio cassette. Hobbyists have created hundreds of games for the Astrocade, which anyone can purchase

from one of several Astro user groups.

Gamers have showered the Astrocade controllers with deserved praise. This combination joystick-paddle-trigger provides a lot of flexibility, and some pretty ingenious control schemes in cartridges like "Football." Another nice touch is that the controller can be used to select a game, choose the difficulty level, and determine the number of participants. No other video-game system has a comparable remote-control option.

Having "resident" (built-in) games is another way in which the Astrocade differs from other systems. Instantly available when you turn on the console are "Checkmate" (a line-building game for up to four), "Gunfight" (a wild-West showdown), "Scribing" (a drawing program), and a calculator. It's like getting several free cartridges, and that takes a lot of the sting out of the over-$200 discount price.
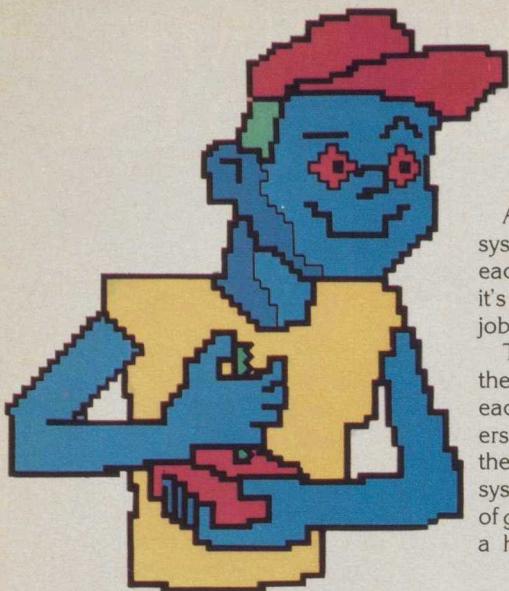
Sizing Up the Games

All the currently popular video-game systems have good hardware. Though each machine has its pluses and minuses, it's hard to find one that doesn't do a good job as a home arcade.

The most important distinction among the various brands is the composition of each unit's cartridge library. Manufacturers naturally try to strike a balance with their game collections, but since each system is most suitable for different kinds of games, each library tends to emphasize a handful of categories while slighting others. For example, the Intellivision roster of cartridges is rich in two-player sports simulations, but somewhat deficient in solitaire-action contests.

What follows is a "software" shopping list for each of the current four leading programmable systems. It is intended to give a general idea of what games are available for the most popular game machines while also providing some specific titles that new and not so new owners will want to check out for possible purchase.

Games: Atari VCS

Exciting action games, both single- and multi-player, are the main attraction of the Atari game catalog. The company is also active in the coin-op field, so there is also an emphasis on translating its own and other companies' commercial-arcade designs into home cartridges. Some of the best titles (with publishers' names in parentheses) are:

Space Invaders (Atari). A superb VCS edition of the game that began the arcade video-game craze. The player moves a horizontally mobile cannon across the bottom of the screen while trying to repel hordes of invaders marching down the screen. The cartridge includes plenty of oddball variations, too.

Missile Command (Atari). This cartridge gets many votes as the best coin-op translation ever done for the VCS. Save your six cities by blasting the waves of enemy missiles which would otherwise destroy them. Players have amazing latitude in selecting the skill level at which they want the action to begin.

Superman (Atari). The solo gamer takes the role of the Man of Steel and attempts to catch Luthor and his gang, repair the Metropolis Bridge, and file the story at the *Daily Planet.* Surprisingly good graphics embellish this electronic superhero romp.

Kaboom! (Activision) A hand/eye challenge pits the arcader's buckets against the terrorist's falling bombs. Miss one and all of them explode in a chain reaction. The graphics are exceptional, and the game plays lightning-quick.
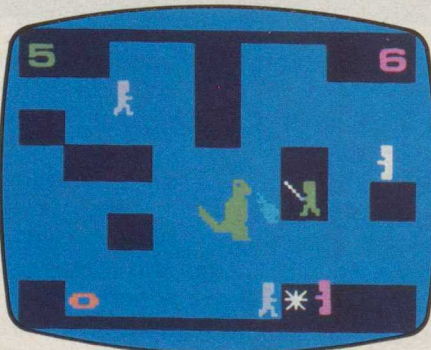
Demon Attack (Imagic). This game's slick graphics are a quantum leap for the VCS. Otherwise, the cartridge is a state-of-the-art invasion game in which the human gunner must destroy a huge variety of alien attackers.
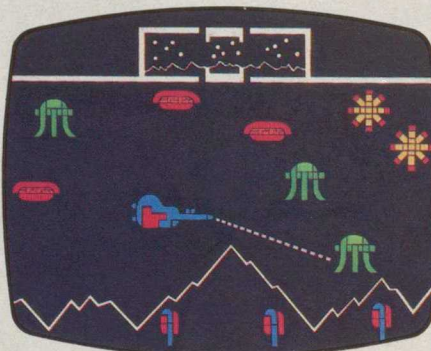
Defender
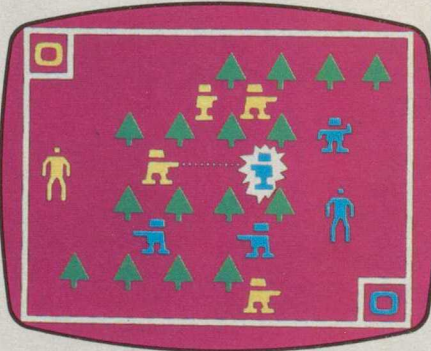
War of Nerves

Quest for the Rings

Tennis (Activision). This is one of the few really good sports games for the Atari VCS. Not terribly complicated, admittedly, but it packs a lot of fun into its easy-to-play program. Best of all, it can be enjoyed solitaire against the computer.

Starmaster (Activision). This is the best space-piloting game cartridge ever created for a programmable video-game system, though Arcadia's "Planet Patrol," on cassette for use with the Supercharger, must be acknowledged as the overall champion. Cruise the galaxy and attempt to save your friendly starbases from interstellar attack.

Defender (Atari). It isn't quite the same as the coin-op original, but it's a fine home screen-scrolling shootout nevertheless. Can you save the survivors of a nuclear attack from further suffering?

Space Caverns (Games by Apollo). Though some may find the control scheme a little unusual, "Space Cavern" offers a stern test of marksmanship and reflexes. It features four aliens flying randomly near the ceiling of a large cave, dropping bombs on the spacesuited astronaut below. Shaggy horrors occasionally erupt from side caves to make things even more interesting.

Games: Odyssey²

If variety is the spice of life, gamers will have to beware of getting a case of heartburn from the Odyssey² game catalog. Although only about 30 cartridges are available now, titles range from sports to space, strategy classics to modern war games. Top-ranked cartridges include:

UFO. As commander of an Earth Fed-

eration saucer in this solitaire action game, the arcader must fight off an endless stream of killer satellites and lethal star ships. One of the best video games on the market, this one promises about 10 minutes of furious action followed by some nice explosions when the aliens finally destroy your ship.

Baseball! This classic two-player simulation balances the most important elements of real-life baseball in a most pleasing mixture. Features include precise pitch selection, movable outfielders, and ability to stretch hits for extra bases if you're daring.

War of Nerves. This electronic war game is packed with strategic possibilities. Each player takes command of a robot army and then tries to eliminate opposition on the way to capturing the other side's general. The play system, though far from difficult to master, is unique among video-game cartridges.

Quest for the Rings. The first game released in the Master Strategy Series blends video-game and board-game action to produce a richly atmospheric fantasy quest in which two gamers can play cooperatively to round up a full set of mystic keys. Each participant may choose a different hero from among a number of different kinds with correspondingly unique powers.

Great Wall Street Fortune Hunt. This is the electronic money game that even the real wheeler-dealers can't resist. And if you don't want to plunge in over your head, there are several difficulty levels in this blend of board game and video game.

Games: Intellivision

There aren't enough one-player contests, and arcade-style action cartridges are sparse, but Intellivision yields to no other system when it comes to sports simulations. If you can corral another gamer to serve as rival coach, this system can furnish the ultimate electronic sports experience. Some of the top games for this system (with manufacturers' names in parentheses) are:

Major League Baseball (Mattel). A system-seller when first introduced, "Major League Baseball" has lost none of its luster. It's all here: pitching, hitting (including bunting), fielding, and running. No baseball cartridge offers more authentic detail.

NFL Football (Mattel). This cartridge may be too complicated for the casual video-gamer, but it is calculated to send a football fan into ecstasy. The scrolling playfield and great number of offensive and defensive play possibilities are without peer in the video-game field.
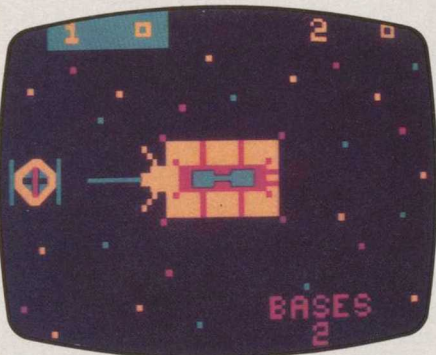
NASL Soccer (Mattel). The three-quarter perspective and the scrolling playfield make this game fascinating even to those who don't care for the real sport. Each human coach controls one player
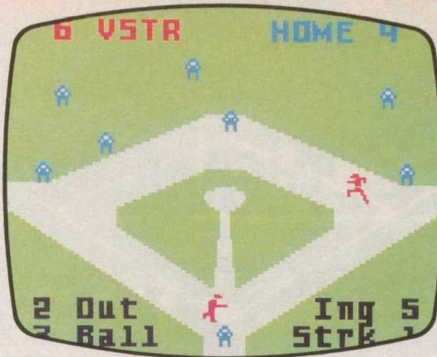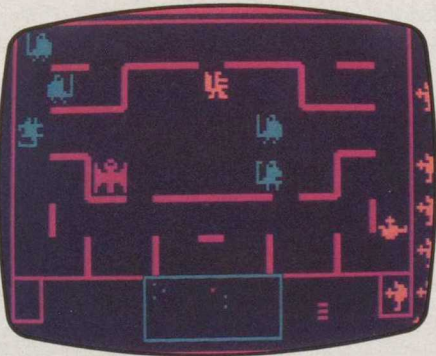

Major League Baseball


Astrosmash

Space Fortress

The Incredible Wizard

(the ball carrier or the opponent guarding him), while the computer keeps the rest of the team in the game.

Space Battle (Mattel). This cartridge blends the strategic and tactical aspects of space combat. Using the long-range scanner, you must watch the advance of alien fleets toward your mothership. You dispatch squadrons to deal with threats and then, when opposing forces meet in deep space, take command of the lead fighter to enjoy the firsthand thrill of eliminating your foes with well-placed laser blasts.

Astrosmash (Mattel). This is probably the most popular action game produced by Mattel for play on the Intellivision. It combines elements of such familiar games as "Space Invaders," "Asteroids," and "Missile Command" as players attempt to shoot various objects falling from the sky before they crash-land at the bottom of the playfield.

Demon Attack (Imagic). The Intellivision version of this invasion game is even more thrilling graphically than the original VCS edition. It still has the same excitement quotient, though, as arcaders try to blast away at a multitude of weird attackers.
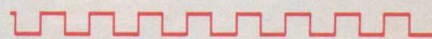
Games: Astrocade

One of the most encouraging things about Astrocade's takeover of the Bally Professional Arcade project is that the new ownership is hip-deep into development of new games. The catalog should be considerably thicker in a year than it is today, although quite a few excellent cartridges are on the list already. Some of the best games (all by Astrocade) are:

Brickyard/Clowns. This two-game cartridge is a bargain. It has not only a good version of the classic brick-bashing contest, but a home edition of the coin-op game in which a pair of clowns bounce up and down on a little teetertotter as they try to puncture the balloons floating along near the top of the screen.

Football. This two-player game strikes a pleasing median between too much and not enough detail. Although there is no lack of play-calling flexibility, the play routine is easy enough for even a casual player to learn without a lot of boring study.

Space Fortress. Test your reflexes to their limit with this no-holds-barred shootout. The arcader commands the space station in the middle of the screen and must shoot the enemies (and their missiles) as they appear randomly at the four edges of the screen and advance toward your position. Action starts slowly and builds to total frenzy.

Galactic Invasion. So far, at least, this is the only home edition of the Midway coin-op sequel to "Space Invaders" and "Galaxian." The opening position is essentially the same in both games, but in "Galaxian" the alien attackers break formation for swooping bombing runs against the defender's cannon.

The Incredible Wizard. Bod Odgon, who designed the coin-op "Wizard of Wor," also created the home version of the quarter-snatcher for Astrocade. It is a near-perfect translation; some arcaders claim it is even more fun than the original. One or two gamers can play competitively or cooperatively to clear successive mazes of menacing creatures, some of which are invisible and can only be seen on the radar scope located at the bottom-center of the main display.

New Systems for 1983

No fewer than four new systems are set to debut for the current Christmas season. It is unlikely that all eight (adding in the current "big four") can survive over the long haul. Yet there are so many cartridges for each system that an owner should get years of enjoyment even if the system he or she buys goes out of business. Any state-of-the-art console should carry you through to your first home-computer purchase, which experts tell us is likely to be within the next three to five years.

Competition within the video-gaming field is so intense that several of the new systems were not ready for a full press preview at presstime—but we were allowed advance peeks. Here's what we learned:

Atari 5200

From the moment Atari showed us its first prototype for this machine, then dubbed "System X," it was clear this is intended to be the company's state-of-the-art system for the mid-'80s. While its $299 list price might be steep for a video game, the 5200 boasts a memory capacity that dwarfs most of the video-game competition—and not a few small computers. It is considerably more powerful than any of the current "big four."

The 5200 is designed to present home games with visual effects on a par with current coin-op machines. Within the limitations imposed by the primitive video technology of the family TV set, the system pretty much delivers on this seemingly grandiose promise. Cartridges for the 5200, which include commercial arcade hits like "Centipede" and "Pac-Man" as well as high-quality sports simulations, do indeed have the fine graphic detail one associates with the pay-per-play devices.

The console is attractive and comes with a pair of multi-function controllers. Interestingly, the 5200 looks much like the housing Atari had planned to use on its announced-but-never-produced remote-control VCS. Although there is no keyboard, the 5200 is in many respects a close cousin to the Atari 400 computer system, albeit considerably more powerful than any 400 not strengthened with a third-party-produced upgrade board to enhance its standard 16K memory capacity. At 48K (many times the memory capacity of Atari's original VCS), the 5200 should hold just about any program Atari game inventors are likely to create.

One piece of bad news for current VCS owners: the two machines are not compatible. That is, you won't be able to use all those game cartridges you bought for the VCS on your new 5200, at least as things stand now. The possibility of a plug-in adapter that would permit use of VCS games on the 5200 is rumored but not confirmed.

ColecoVision

This relative newcomer to electronic gaming has jumped into the field with both feet. It is producing a line of stand-alone mini-arcades, cartridges for the Intellivision and VCS, and a state-of-the-art video-game system of its own with games to match.

The ColecoVision system is one of the two so-called "third generation" systems going into distribution this year. (The other is the Atari 5200.) Such units are intended to fill the gap between standard and senior machines on one hand and low-priced computers on the other. Coleco has designed its console to facilitate connection of add-ons which will permit ColecoVision to be periodically upgraded. The manufacturer hopes by this method to keep its unit up with the leaders for at least the next five years.

It is a beautiful machine, but the real excitement is on the inside. By providing more than 7000 bytes of screen random-access memory (RAM), ColecoVision's designers have endowed the system with graphics that would even make the folks over at Mattel jealous. Not only are the visuals more detailed, but more objects can be in motion at the same time than is possible on competing systems without telltale flickering of the on-screen images.

Coleco is also striking a blow for compatibility. The first peripheral the company plans to produce is an adapter that allows the ColecoVision to play any cartridge originally designed for use with the VCS. You can even use your Atari-compatible joysticks! This may be an extra bonus since there is some question about how responsive ColecoVision's multifunction command devices are. A similar adapter to handle Intellivision

ColecoVision: striking blows for detailed visuals and compatibility.

games and a full keyboard are other peripherals Coleco plans to produce in the near future.

The software is pretty exciting too. Coleco will have an extensive cartridge library right from the beginning thanks to an aggressive policy of licensing coin-op hits for home translation. "Gorf," "Zaxxon," "Venture," and "Turbo" are four of the promised titles. There will also be adventure games based on the Smurfs and the nonelectronic "Tunnels & Trolls" as well as a set of sports contests that will carry Coleco's familiar "Head-to-Head" brand into the video-game field.

Emerson Arcadia 2001

The Arcadia 2001 is a mighty mite of a video-game system. Though physically the smallest currently available home-arcade machine, its 28K of resident memory makes it one of the most powerful. (None of Emerson's initial group of cartridges takes much advantage of this, however—the longest program is roughly 8K in size. Heftier games will come in time.) This is the first portable system. It works from any 12-volt DC power source, making it a potential take-along in boat or camper. And when pint-size color TV becomes available in a year or so—watch out!

The controllers are very similar to those on Mattel's Intellivision. The Emerson version features a dozen touch-sensitive buttons, a pair of side-mounted action buttons (versus four on the Intellivision), and a direction disk for steering. The manufacturer has earned the loyalty of disk-haters everywhere by including a pair of screw-on joystick handles which convert the circular direction control to standard joystick operation.

One hardware limitation worth noting is that the Arcadia 2001 does not automatically blank the screen after two minutes of inaction or otherwise protect the TV picture tube from overwork. The manufacturer intends to correct this flaw, but owners of this unit will have to be careful about leaving it on while unattended.

Emerson Arcadia: a first—the first portable video-game system.

Among the cartridges already available for this system are "Baseball," "Breakaway" (brick-bashing), "Cat Trax" (maze chase), and "Jungler" (maze chase).

GCE Vectrex

General Consumer Electronics (GCE), until now best known for its line of game-playing watches, has created something utterly new and different in programmable video games. The Vectrex is built around a nine-inch diagonal black-and-white monitor, thus forever unhooking it from the family set.

And it's not just an ordinary monitor. GCE has used a vertical graphics tube rather than the usual horizontal monitor found in every TV. This produces graphics featuring finely etched white lines with a lot of three-dimensional simulation. If you liked the way "Asteroids" looked in the commercial arcades—it was in black-and-white quadrascan—you're bound to love the Vectrex.

The absence of color is little problem. Each cartridge comes with a heavy plastic overlay which slips easily into slots that frame the screen. To say these are well-executed would be an understatement. At times, it's almost possible to forget that you're playing in monochrome. If you simply must have true color, you may have to wait until late 1983 when GCE is expected to introduce a color version.

The controllers are first-class. Each features a row of four buttons and a small metal joystick. Despite its size, this command stick is very responsive, providing the fluid movement so necessary for space-themed shoot-'em-ups. Each game uses a different combination of stick and/or buttons. A summary of each game's control system appears at the bottom of the appropriate overlay in case the player needs a midgame reminder.

The first group of cartridges is very good, with science-fiction themes dominating. The most entertaining are "Star Trek" (a space-combat game), "Hyperchase" (a super-detailed multi-scenario driving game), and "Scramble" (a home version of the popular coin-op scrolling shootout).

What's Next for Video Games

So much has happened in the video-gaming world during 1982 that it's hard to make too many predictions about what's going to happen in the field in 1983. The debut of four new systems is sure to generate enough excitement to keep the whole hobby bubbling for at least the next six months. One thing's for sure: we haven't seen the last system introduction. Several are slated to make their first appearances in the U.S. in 1983, such as the machine Tomy showcased at a recent Japanese trade show. Others likely to be worth a look-see include:

Max (Commodore). This system, originally called Ultramax when first mentioned by Commodore last year, is set to roll out under this shortened moniker. Listing for $149.95, it is expected to be positioned as a small game-playing device one step down from the VIC-20 (with
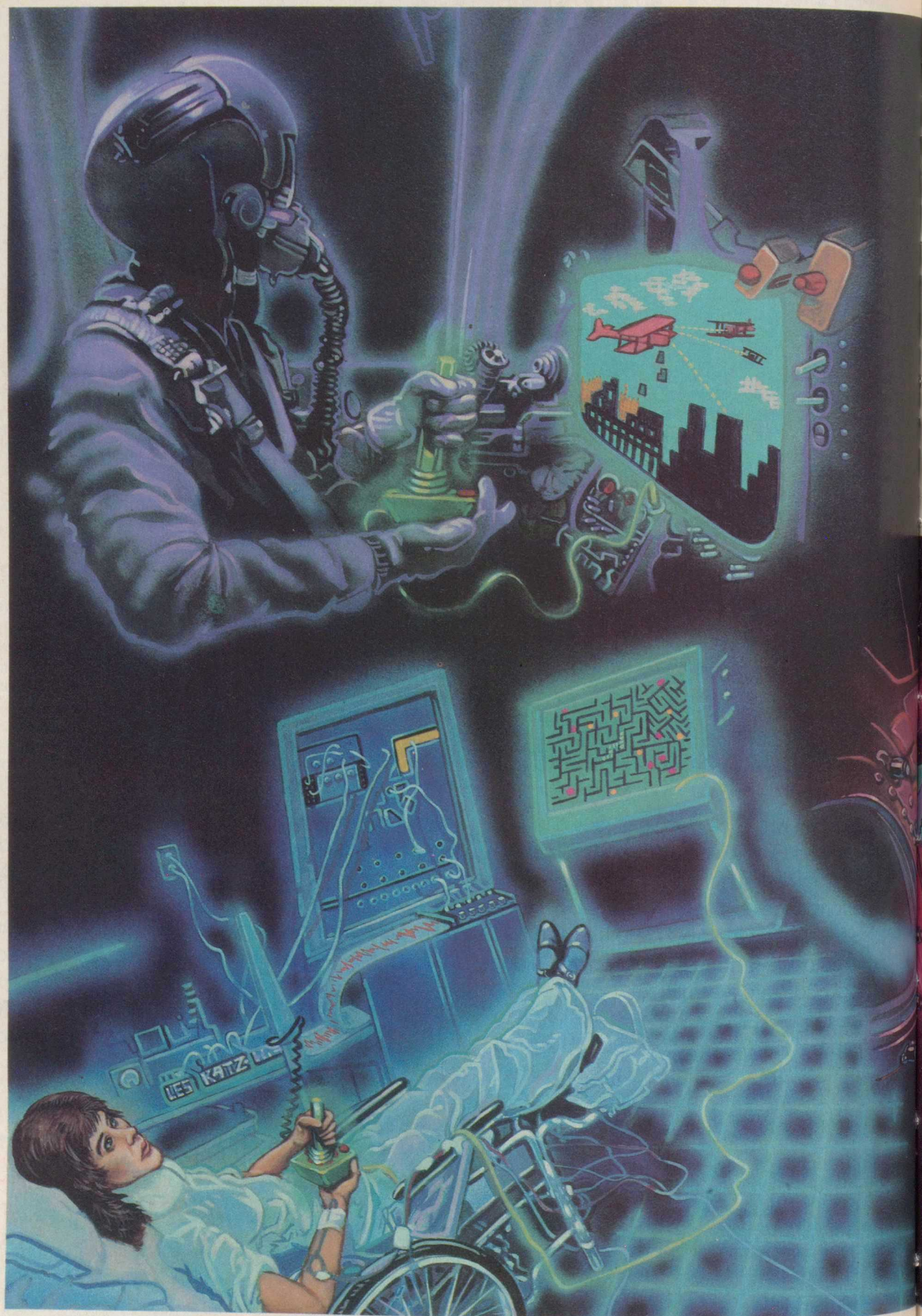
The best thing being said today about video games is that they are merely expensive toys—*the* fad of the 80s, appealing mostly to the computer-oriented younger generation. The worst thing said is that those ubiquitous video arcades are tempting young people into drugs, sex, and all sorts of wasteful, expensive, sinful pursuits. Hardly anyone sees the proliferation of video games as a positive force.

Hardly anyone, that is, except a battery of educators, psychologists, physicians, and researchers now excitedly finding a slew of social, medical, even business uses for common video games such as "Pong" and "Pac-Man" and "Space Invaders." These researchers predict that video games and their more complex computerized cousins will become essential tools for learning, for testing human abilities and disabilities, and for retraining the physically injured or mentally handicapped.

In the foreseeable future, you may be asked to pass a video-game test before you can get a job—the games might even become part of your training. If you're in a high-stress profession—isolated on an offshore oil rig, for example—the games might be used as occupational therapy to relieve your stress while also monitoring its intensity.

Someday soon a routine medical exam may include a fast round of "Breakout" to test for neurological disturbances or toxic poisoning or subtle signs of alcohol or drug abuse. Should you have the bad fortune to suffer a stroke or some other severe injury to the brain, your ability to manipulate a joystick may signal your chances for recovery, and video games could become an important element in your rehabilitation.

And that's just the beginning.

Dr. Robert Kennedy, now of the Canyon Research Group in Orlando, Florida, was one of the earliest video-game ex-perimenters. He's been at it since 1978, when he was in the U.S. Navy at the Naval Training Equipment Center in New Orleans. He started using games to test the performance of sailors experiencing motion sickness, then moved on to analyzing use of such game cartridges as Atari's "Air Combat" in training pilots. To date, Kennedy's work has shown that the games use some of the same skills as the cumbersome and expensive full-scale flight simulators. Now he's trying to find out whether practicing on games actually *improves* performance on the simulator and in actual flight.

Like all the other researchers experimenting with video games, Kennedy is enthusiastic about their possible uses in both clinical and practical settings. At a symposium in Houston last spring, he and a few colleagues tried to define the major applications of video-game technology in the behavioral sciences. They came up with three categories: (1) Selection

Putting Video Games to Work

Medical therapy, military training—innovative researchers are finding valuable new uses for electronic games

by Shirley Sealy
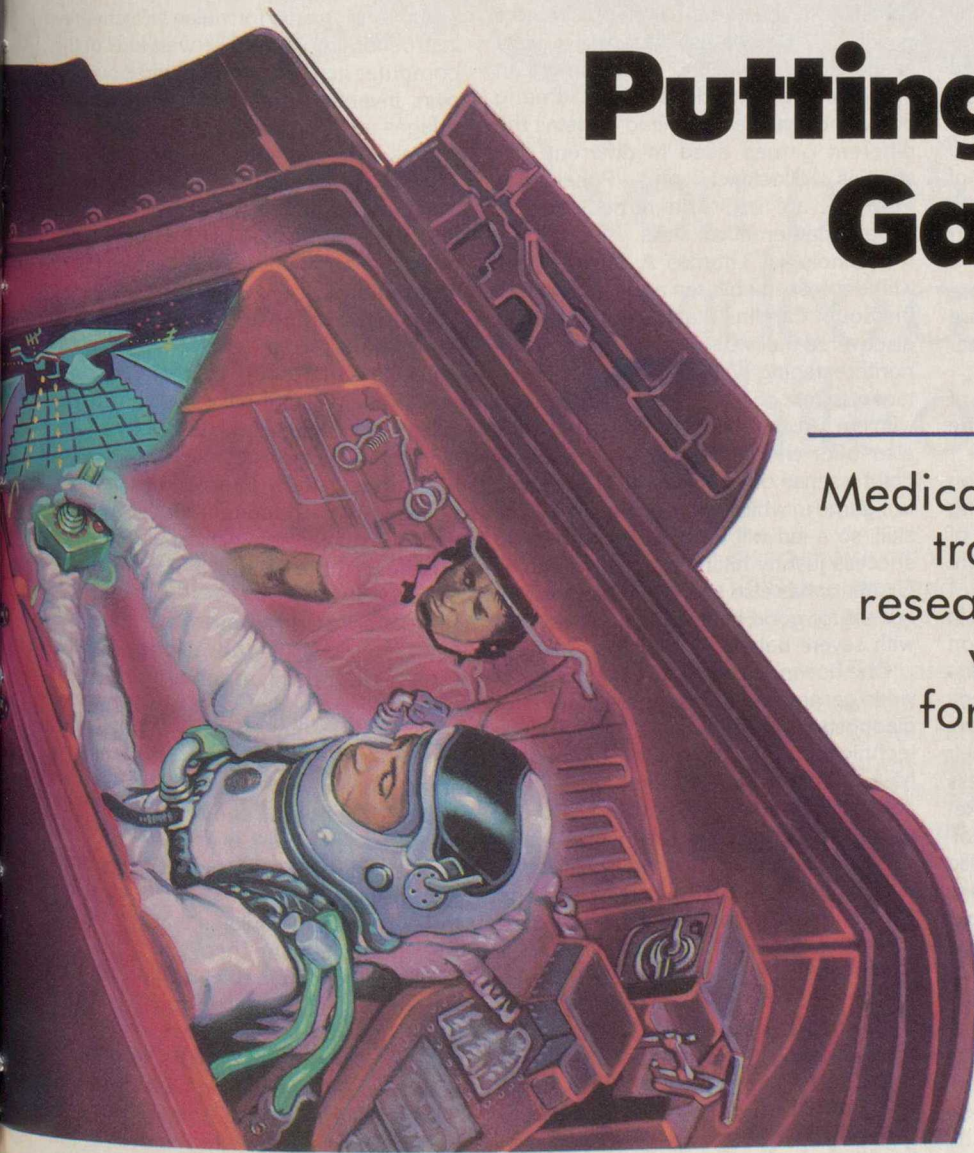
Video Games

which it will *not* be compatible).

Emerson Arcadia. This is rumored to be a stripped-down version of the Arcadia 2001 at an ultra-low price. Emerson, it is believed, intends to sell it in stores for under $100!

Odyssey³ (North American Philips). The reconstituted Odyssey division of N.A.P. is readying a new system to give established devices a run for their money. It will straddle the fence between a video-game player and a personal computer, and undoubtedly put even more stress on the keyboard than does the current O². A library of game cartridges is planned, and there's considerable hope that the Odyssey³ will play programs originally designed for the Odyssey².

This year will see the focus shift from programmable video-game systems to personal computers as the primary focus of electronic home arcading. The discount price of the VIC-20 has dipped to under $200 at some outlets, and the cost of the Atari 400 is nearly as low. This has virtually erased any price differential between top-of-the-line video games and low-end microcomputers—a definite encouragement to those who want to trade up. More powerful personal computers such as the Atari 800 and Apple II can also be expected to play an expanded role. Thanks to the efforts of third-party software vendors, both machines now have huge libraries of game programs, making them attractive to home arcaders in search of more sophisticated challenges.

The first major thrust by Japanese personal-computer companies will probably come in mid-1983. They've been sizing up the market for about the last two years, and they are only waiting for the right moment to take the plunge. Also providing competition for domestic machines will be the Sinclair Spectrum. This is the big brother of the unit now sold in this country as the Timex TS1000. The Spectrum, however, is a 48K machine with a large calculator-style keyboard intended to compete with the Atari 800 and Apple II. At a suggested list price of under $400 ($300 for the 16K version), it should compete with the established brands.

But don't worry, video-gamers: plenty of new cartridges will come out for existing systems next year. More thematic variety will be the watchword as companies seek a way to make their cartridges stand out from the hundreds of titles on the market. Less emphasis on science fiction is a likely trend, since space contests dominate the 1982 crop.

Many companies will seek to create unique games in 1983. One company intends to produce a line of adult, perhaps even X-rated, cartridges while several others will be bringing out games aimed at young children. Atari VCS owners can look forward to companies moving in to capitalize on the possibilities of Arcadia's Supercharger.

Peripherals and accessories will continue to grow in importance next year. WICO expects to have its full line of gourmet joysticks in stores by the end of 1982, and rival companies are making plans to get their versions out soon afterward. Whether you want a control device with a handle so long that the base can be set on the floor or a complete multicontroller panel, odds are excellent that it will be available by winter 1983. Other gadgets heading toward us include all manner of storage cases, extension cords for joysticks to enable players to sit farther from the screen, and cables for connecting your video game to your stereo system.

Although some worry about flooding the market with new cartridges, the video-game boom will probably go on for at least the next year or so. Though some game producers may fall by the wayside in the coming months, the successful ones will easily fill any gaps with extensive selections of new games. **V**

Video games are proving to be successful diagnostic and theraputic tools. . .

devices—if a game can isolate skills needed in certain occupations, it could be used to screen job applicants. (2) Training devices—as in the flight training, or rehabilitation of the physically or mentally handicapped. (3) Performance testing devices—which would use the games to explore, in Kennedy's words, "whether anything untoward has happened to the individual."

The third area of research is the most active. Here's a random selection of current projects:

● An astronomer at Stamford is reportedly taking a brace of games and a gaggle of volunteers to an observatory atop a 12,000-foot mountain to find out if the humans' performance is hampered by the altitude—and if it is, to possibly recommend something like a pressurized chamber for workers in lofty observatories. In a related experiment, Dr. Kennedy tells of a colleague who's off to climb the Himalayas with a hand-held game of "Touch Me" to assess the effects of the rarefied air on his short-term memory.

● Other researchers at Stamford are video-game-testing volunteers before and after they use marijuana and other controlled substances.

● NASA may soon employ a battery of electronic-game tests to help determine the effects of space sickness.

● The Federal Aviation Administration (FAA) is devising standard tests using video games "to study the effects of long-term alcohol abuse and how it might damage performance."

The FAA is most interested, naturally, in the performance of those in the aviation industry—pilots and air traffic controllers. "The idea is to apply these tests early enough to be able to start rehabilitation. We want to keep these people at their jobs, performing at maximum," says Jess McKenzie, Chief of the Stress Analysis Research Unit at the FAA's Aviation Physiology Lab in Oklahoma City. McKenzie also notes that video games may have a role in screening applicants for training in air-traffic control. "Atari's 'Combat' cartridge is as good at testing a talent we call 'pursuit tracking' as some specially made devices that can cost up to $5000," he says.

Joystick as Therapist

The same kind of talents also interest medical therapists. "When you look at the games—'Space Invaders,' 'Pac-Man,' 'Breakout'—you see that they require good eye/hand coordination," says Dr.

William P. Lynch, Director of the Brain Rehabilitation Unit at the Veterans Administration Medical Center in Palo Alto, California. He adds: "In playing these games you have to react quickly, but not too quickly as there's a premium on accuracy. And you have to pay attention to keep your mind on the rules of the game." These tasks, Lynch stresses, "are the kinds of things we try to train people to do after a head injury or stroke."

Lynch's work with video games also began in 1978, but then his brain-injured patients just used them recreationally, "to wile away the time." A year later his staff started keeping careful records on patients' performance, then started devising special tests. Last year Lynch presented a paper, "TV Games as Therapeutic Interventions," to a meeting of the American Psychological Association. In it, among other findings, he described in detail the different games used in different disabilities. "Blackjack" and "Poker," for example, are useful in remediation of simple mathematical skills.

Psychologist Thomas A. Minor works with depressed children and teenagers at the South Carolina State Hospital. He has discovered that video games are "a good, nonthreatening way to provoke a spontaneous response and establish rapport with the withdrawn child." The games can also offer the withdrawn or depressed child a sense of self-esteem. " 'Asteroids' is a game in which you don't need a lot of skill, so a kid will have some immediate success just by hitting the firing button." Dr. Minor has also used video games as a reward for good behavior for adolescents with severe behavior problems.

One doesn't need a Ph.D. to guess why video games are proving to be successful diagnostic and therapeutic tools. But, in technical terminology, they happen to have "excellent metric properties," according to Kennedy. "They are highly repeatable, highly reliable, portable, transportable, safe, easily available, comparatively inexpensive, clinically valid—and they maintain the interest of the subjects."

On this last point, Kennedy continues: "One can feel fairly comfortable that performance on the games is not due to lack of motivation, because they are so intrinsically appealing." What Kennedy means is that video games are fun. That's something on which everyone agrees—even the doomsayers who see the video-game craze as the great social scourge of the 20th century.

Fun, of course, is something that the

field of education could use more of. As Plato put it: "In teaching children, train them by a kind of game, and you will be able to see more clearly the natural bent of each." This quote was used by Thomas W. Malone of the Xerox Palo Alto Research Center to introduce his doctoral dissertation, "Toward a Theory of Intrinsically Motivating Instruction," in which he looked at computer games—not the strictly video variety—to find out why they are so captivating and to isolate features that make learning "interesting and enjoyable."

Kids Nowadays

Malone is not alone in attempting to find the electronic formulae to alchemize instruction into play. The whiz kids of the computer generation are doing it on their own, inventing their own computer languages and programs, finding ways to "break into" other computer systems. There have even been reports of impish computer vandalism—like the West Coast teenagers who used a home computer to disrupt phone service in an entire community.

But what of those kids whose parents can't afford an Atari 800 or Apple computer? Are they going to miss out on the revolution in electronic education? Some scientists speculate that the easily affordable home game systems such as Atari's VCS and Mattel's Intellivision could be made more adaptable—with memory and information-retrieval capacities—and therefore more useful as teaching devices.

Others insist, however, that those inventive fellows in the electronic think tanks are pretty much ignoring the home-video market because they have bigger fish to bait. The real money right now is in arcade games—and their designs are growing ever more esoteric in hopes of capturing the restless fancy of the teenage game player.

Among the new wave of games: "Robotron: 2084" from Williams Electronics, which postulates that the end of the world is at hand thanks to a group of evil, intelligent robots. The player is challenged to save the last human family—which brings a heavy dose of human interest to the merely visual challenge of doing away with bleeping ciphers. Out in Silicon Valley, Atari designer Chris Crawford is reportedly working on a more or less "educational" game based on the ancient Arthurian legend—which will

Do It Yourself

Q I have a Sony SL5600 Betamax on which I record about 20 hours of programs per week. Now I am having problems rewinding tapes all the way. Some slow down with a squeaky noise and occasionally stop completely. Also, I lose just about all audio during the first hour of recording. I just had the machine serviced for these problems about three months ago but they're back again. Do you think my tapes are worn out from so much use?

A Start your own diagnosis by testing with new tapes to see if they behave the same. If they don't, your theory about overusing your existing tapes is probably right.

Normally, videotapes can withstand several hundred passes through a machine before problems begin to develop—oxide starts to shed and wear off the binder and the lubricant applied to the back of the tape begins to wear out. These effects can be aggravated by poor cassette handling. If the shells are warped, bent, or misaligned, it won't be possible for the tape to shuttle back and forth between the two reels evenly. That's especially important with Beta machines since the tape runs through a longer path around the video drum inside the machine. **V**

transmit to the player a smattering of history, geography, and art appreciation.

According to video-game expert Michael Schrage, the games may soon acquire dramatic content—with the player himself devising a script. Schrage predicts that Hollywood moguls are getting into video games, spurred on by the astounding fact that in 1981, an estimated $6 billion were spent on all forms of video games, as against $3 billion on movies. When such cinematic geniuses as George Lucas apply their talents to the state of the art, writes Schrage, "soon you won't be playing the game, you'll be *inhabiting* it—it will be a fantastic reality or realistic fantasy."

Meanwhile, at least one behavioral psychologist, Robert Gable—a professor at Claremont College in California who describes his professional viewpoint as "mellow high-tech"—thinks today's video arcades will become "communication centers outside of the school." Gable theorizes that adolescents are flocking to the arcades not so much for love of playing the games, but because the arcades have become the new social centers—replacing the soda fountains, pool halls, pinball parlors, pizza joints, and coffee houses of previous generations. But unlike the time-wasting pursuits indigenous to those bygone places, video arcades at least offer the possibility for youngsters to learn something.

Gable intends to find out how to exploit that possibility by testing coin-operated machines that combine elements of an instructional computer program with today's video games. "I want to get the kids to a terminal in an arcade and I want them to put their quarters in and I want them to learn something." He sees these game/teacher hybrids as an extension of the classroom, with the possibility of a human instructor monitoring and conceivably grading a player/student's performance. Gable admits these ideas have yet to be tested, let alone proven, and ruefully adds, "Somebody else will do it if I don't."

He means there's so much more to come that we can scarcely envision the importance of video games to Futureworld. Meanwhile, it's clear—as Schrage points out—that as a sociological phenomenon, "Pac-Man" is merely the Mickey Mouse of the 1980s. **V**