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The Electric Zoo: Video Game Paratext in American Arcades and Homes

Joseph Hudson Voltz
Lehigh University

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The Electric Zoo:
Video Game Paratext in American Arcades and Homes

by

Joseph Voltz

A Thesis

Presented to the Graduate and Research Committee

of Lehigh University

in Candidacy for the Degree of

Master of Arts

in

History

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Joseph H. Voltz

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The Electric Zoo: Video Game Paratext in American Arcades and Homes

Joseph H. Voltz

Date Approved

John Pettegrew
Thesis Advisor

John Smith
Department Chair Person

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Abstract:

This thesis explores the use of paratext, or the material surrounding a text, in the rise of video games in American arcades and homes. Paratext bridged the gap between the game and the player, inviting players to play and providing context to a game's content. By translating game rules into context players understood, paratext mirrored American culture and common themes players recognized. While arcades were the originating space for video games, home console games became more prevalent in the late 1970s and eclipsed the arcade as innovative space for video games. Atari dominated the game industry and its paratext through the video game market crash in 1982 and 1983. Following that, Nintendo used paratext to create and control its own image to break into the American market. The research shows that material surrounding a game remained as important as gameplay throughout the formative years of the game industry.

Introduction

Games such as Pac-Man and Space Invaders were going into virtually every location in the country, with the exception of maybe funeral parlors, and even a few funeral parlors had video games in the basements. Absolutely true. I believe churches and synagogues were about the only types of locations to escape video games.

Eddie Adlum, publisher of RePlay Magazine¹

All the headlines said, "Video games are dead," and here was this little upstart company that no one had ever heard of called Nintendo that said they were going to bring video games back again. Everybody seemed to think it was a joke.

Herb Weisbaum, consumer affairs correspondent, CBS News²

Video games were once big business in America. Having caught on with simple tennis games such as *PONG* in the late 1970s and fitting in neatly with pinball machines, video games invaded bars, bowling alleys, shopping malls, and nearly every storefront that could squeeze in an arcade cabinet. They entertained crowds and brought in steady profits for the operators, developers, and producers of arcade machines. Video games also moved into the homes of many American families. The demand for games swelled, crashed, and revived within the space of a decade. Many observers considered games to be a fad, another by-product of the rapid development in computer technology. However, video games survived into the next millennium, gathering cultural meaning along the way. Video games became complex entities, going beyond the original intention of a pleasant distraction in a crowded tavern, or a way for bored university students to entertain themselves in a computer lab.

Long after their players left them behind, the meaning of video games lived on through a complicated series of interlocking meanings, symbols and depictions concerning them. This web of meaning extended outward from all games, informing passive observers about the game before, during, and after the game is played. In literary analysis, *paratext* refers to the material surrounding a text, providing a frame for it in practical terms as well as interpretive ones. Gerard Genette originally described paratext as a "threshold", which could influence public perception and consumption of the text. The intention of influence remains in the hands of the publisher and producer of paratext

¹ Steven Kent, *The Ultimate History of Video Games* (New York: Three Rivers Press, 2001), 123

² Kent, *The Ultimate History of Video Games*, 280.

material. Genette cautions that although the paratext was "a fringe on the printed text", it nevertheless "in reality controls one's whole reading of the text."³ Considering all media as texts in analytical terms, video games also have paratext surrounding them, perhaps as important as the game itself.

The rapid rise, fall, and rebirth of the video game industry occurred between 1972 and 1986, an era bookended first by the release of *PONG* in arcades and concluded with the American launch of the Nintendo Entertainment System.⁴ During this time, arcades and arcade games created and expanded the video game industry from humble ping-pong games through the space blasters to the maze running pellet munchers and beyond. The home game consoles developed in tandem to arcade games during this time. While some games remained unique to the home systems, the home games largely drew on arcade games for inspiration, often importing concepts and titles directly to home games. These "ports" made do with the weaker technology of home game consoles, and ran inferior graphics and control schemes as a result. However, the convenience of a video game in the living room became a powerful draw for many consumers, as well as toy companies and other interested parties, who rushed to fill the growing demand with their own consoles. Due to a glut of rushed consoles, many similar titles competing for shelf space, and poor investments by high profile companies, the saturated home market buckled and collapsed in the US over the 1983 holiday season. In the years following this event, a lone Japanese company decided to enter the American console market and would almost single-handedly revive the dormant demand for video games.

The American arcade market and the subsequent home games released in the late 1970s and early 1980s provide fertile ground to survey paratext.. Each arcade game cabinet came wrapped in an advertisement for the game within. Cabinet art adorned the every surface not already occupied by the screen, with a glowing backlit sign above announcing the name of the game. Instructions for play ran up and down the sides of the screen, while a short demonstration of expected play on the screen. Other players crowded around, watching and observing. They talked to one another, bragging about high scores and sharing hints gleaned from strategy books and magazines dedicated to games. The arcade space, aglow with screens and neon, came under scrutiny as a potential breeding

³ Mia Consalvo, *Cheating: Gaining Advantage in Videogames* (Cambridge: The MIT Press, 2007), 21.

⁴ Kent, *The Ultimate History of Video Games*, xii - xiv

ground for sin and immoral behavior. Marketers for home games preyed upon these fears, selling games to the nuclear family as a bonding experience far from the temptations of the arcade. Each form of paratext comes separate from the actual text of gameplay.

When it comes to video games, computer games, and most forms of play, the act of playing the game constitutes the primary source in terms of information. Reading the rules and hearing about gameplay from someone else may not reveal all that there is to know about the text of the game. Modern games in particular hide much of the game beyond a "skill gate" represented by challenges that the player must surpass. Once cleared, these challenges afford more content to explore, including access to another playing area, plot details, or extraneous material such as music, artwork, and "Easter eggs".⁵ Rewarding the player with additional content gives incentive to continue playing and improve techniques, but it also prevents casual observers from gleaning much from the game without resorting to extraordinary measures. Unlike a book, film, or song, games cannot be completed start to finish by laymen. Games fight back, and will not yield until someone with sufficient experience in playing the game challenges it.

Game researchers, historians, and scholars may not have the skill or time to devote to playing through games for the purpose of researching them. Playing the game is akin to reading a text, however, and circumventing the act of play risks losing that experience, having a major portion of the game's text "lost in translation." Videos of others playing games, walkthrough guides, cheat codes, and scripts of story dialogue may help researchers experience more of the game than they personally can access, but there's still something missing from the reading. Robbing a game of play and reducing it to mere words, images and sounds implies that games are nothing more than the sum of their parts, when it is the interactive element that makes games enticing in the first place. These factors make gameplay a primary source material that's difficult to pin down, since the material changes with every reading in some small sense.

⁵ Easter eggs are hidden objects or areas within a game that bestow trivial content such as a developer's name or a quick scene that would be otherwise inaccessible through normal play. They have no overall impact on gameplay, and are a game developer's inside joke.

In order to access a more static source, researchers can instead look at the material surrounding the game. Careful observation reveals much about a game without engaging directly in play, and researchers are not the only ones who resort to this information gathering strategy. Consumers and game players rely on this information before investing themselves in a game, and these sources of information, parallel to the text of the game itself, provide the basis for another avenue into game studies.

While gameplay certainly mattered to players and makes up a critical aspect of game analysis and history, the extraneous information surrounding the game weighs on the consumer-player as well, often becoming more important than gameplay in both the present and historic sense. Contextual information refers to the information within the game itself, while paratext concerns all information outside of the game that still relates to and informs the text to readers - in this case, players. Current video game histories focus on chronicling the rise of the video game, focusing on the evolution of hardware capabilities and breakthroughs in game design.⁶ While these histories remain important, paratextual influence on game players, the industry, and thereby the history of video games needs additional support. This thesis examines the formative years of the video game industry, and seeks how and why the forces that today dominate a multi-billion dollar industry found a foothold in American markets.

In this paper, the term "video game" refers to any dedicated interactive entertainment device experienced through the use of a monitor with an input device handled by the player. This excludes pinball, as it requires no monitor to play, as well as television and computers, which are not strictly dedicated to interactive entertainment. "Arcade" in this case means a venue which chiefly derives its income from video games. This excludes the many other locations where arcade games were placed as ancillary income devices, rather than the main attraction. In a similar vein, "arcade game" refers to the large cabinets of varying design which housed a video game; these populated arcades. Though too expensive and heavy for home use, arcade games formed the initial core of the burgeoning video

⁶ Arthur Asa Berger, *Video Games: A Popular Culture Phenomenon* (New Brunswick: Transaction Publishers, 2002), 55.

game industry. "Home game" refers to dedicated game consoles and, in some cases, family computers meant to display images on a television set, marketed and designed for the consumer.

The Video Game Market

In the 1970s and well into the 1980s, video arcades became the best place to play video games, and were central to the creation and maintenance of video game culture. While home game systems were available, the technology lagged behind that of the arcade machines, which were dedicated systems capable of devoting all their processing power toward one game.⁷ In addition, home consoles exceeded the expected spending for the young consumers toy and game companies hoped would play their games. Home consoles cost around \$200 dollars in the late 1970s, with each individual game costing about a sixth of that price.⁸ As a result, home games angled for the entire family in their marketing, relying on the buying power of the parents. By contrast, most arcade games cost a quarter to play, and were designed in such a way that skilled players earned longer turns at the machine by avoiding elimination. Players without disposable income were priced out of the home and turned to arcades, where skilled play could stretch a dollar into an afternoon of entertainment.⁹

. By 1980, Atari had secured its place as the preeminent home video game console as well as a known producer of quality arcade games. The Atari home game promised to bring the action of the arcade into the living room. While Atari and many other companies saw the wild success of Pong and tried to replicate it at home, Atari's Video Console System (also known as the VCS and later, the 2600) became known for many other games. Atari had borrowed the idea of an interchangeable cartridge format of the Fairchild Video Entertainment System, using it to build a library of games larger than all of their competitors. In doing so, Atari became known as a synonym for video games in

⁷ Mark J.P. Wolf, ed., *Before the Crash: Early Video Game History* (Detroit: Wayne State University Press, 2012), 191.

⁸ Wolf, ed., *Before the Crash: Early Video Game History*, 87.

⁹ Wolf, ed., *Before the Crash: Early Video Game History*, 193.

the home. This, combined with their wide selection at the arcade, ensured their dominance in the minds of consumers.¹⁰

Atari's marketing strategy encouraged consumers to bring the arcade home. In this vein, Atari aggressively secured the exclusive home game rights to *Space Invaders*, a major coup for the company. *Space Invaders* at home sold just as well as in the arcade, due in no small part to the faithful translation of the game. Importing games from the arcade to home consoles remained difficult due to the difference in chipsets, processing power, and the need for the VCS to accommodate multiple game programs, but the engineers at Atari stayed true enough to the original that consumers did not seem to mind. Atari proudly boasts about the "arcade style title display" and "all the fruits and pretzels from the original arcade hit!" in its Atari Age advertisement about *Ms. Pac-Man*.¹¹ Other arcade translations like *Pac-Man* suffered for their adherence to the VCS's limitations, and consumers likewise balked at the substandard game. However, Atari's marketing strategy proved effective regardless of the quality of the game.



Figure 1: Atari's *Space Invaders* was well received, and appeared much like its arcade progenitor. Source: MobyGames.com.

¹⁰ Kent, *The Ultimate History of Video Games*, 132.

¹¹The Atari Club, "Atari Brings Ms. Pac-Man Home," *Atari Age*, January/February 1983, 7.



Figure 2: Atari's *PAC-Man* did not fare as well, drawing negative comparisons to the arcade version. Source: MobyGames.com.

Atari's magazine advertisements offered consumers many reasons to buy Atari. Of these, two types emerged: ads for the console, and ads for individual games. Ads for games assumed the reader already had an Atari, yet presented the subject as if the single game displayed was reason enough to invest in an Atari system. As well, the games advertised always exhibited the best qualities of the Atari system, from joystick controllers to sounds, graphics and gameplay "straight from the arcade!" Ads for the system itself presumed the consumer did not own an Atari VCS already, and set about extolling the many compelling reasons to own one. The wide selection of games and exclusive rights to hot arcade hits featured prominently in the marketing strategy. However, Atari did not retain exclusive rights to home games, or even games for its own console.

Several developers and designers of Atari, frustrated with the company's corporate practices, resigned in order to form Activision, a competing company with experience in the field. However, Activision did not produce a system of its own. Instead, they designed and sold cartridge games compatible with the Atari VCS. After a protracted legal battle, the courts decided in Activision's favor, prompting other companies to begin producing games for consoles they neither owned nor produced.¹² While Atari resisted this, owing to the strength of their own game development, Activision's games remained high quality throughout the early console period, and their presence contributed to the variety of games available for the VCS.

¹² Tristan Donovan, *Replay: The History of Video Games* (East Sussex: Yellow Ant, 2010), 90.

Game players understood that different developers produced different levels of material. The company logo on a game meant as much as the title. Atari understood as much when their advertising asked "Have you played Atari today?" signifying both their prominence in market share as well as the quality of their product. In an era where clones of popular games cluttered arcades, branding and franchise did not mean as much as the company behind the program. Character driven games that could be tied to a copyright were not popular until Pac-Man's success in 1980, so players relied on title and producer to tell the many games apart. This was still problematic; clones adopted similar names to each other, and companies merged and traded publishing rights often.

Overseas publishing rights also differed between games. As an example, the space shooter *Galaga* was published by its developer, Namco, in Japan and by Midway in North America. Midway also developed and produced an unofficial sequel to *Pac-Man*. Namco, the original creators of *Pac-Man*, licensed this sequel and gave it their blessing; it became *Ms. Pac-Man*, which was also published by Namco in Japan and Midway in America. Owing to their massive popularity, the two games endured to present day, and can often be seen paired together in a "Class of 1981" combination cabinet. However, Midway has gone bankrupt, so the copyright on the cabinet reverted to Namco, which publishes the cabinet and has their brand on it. This may seem strange to Americans, who would only remember the Midway mark on both *Galaga* and *Ms. Pac-Man*. The confusing exchange of paratext did not impact the games. The text remained the same.



Figure 3: A Ms-Pac Man and Galaga 'Class of 1981' arcade cabinet, featuring artwork and instructions from both original cabinets, recognizable to novice and veteran players alike. Source: KLOV.com.

Perhaps easier to recognize than corporate exchanges of copyright, character branding became important as players recognized the same characters from game to game. As a result, they expected similar gameplay from one game to the next. *Pac-Man* gobbled power pellets as well as his female counterpart. Mario jumps as his primary means of locomotion in both *Donkey Kong* and *Mario Bros.*, which held over the breakout character of Mario as one way of establishing context, though the gameplay differed between the two. The presence of a familiar face on the screen put players at ease, establishing a sense of familiarity as well as laying the groundwork of a possible franchise.

Similarities in design between games and characters also established conventions that a player could expect to see. A maze-like structure on screen with a cartoonish hero and several adversaries resulted in a *Pac-Man* mentality, where one had to clear the maze while avoiding adversaries. A row of menacing figures at the top of the screen opposed by a lone figure at the bottom brought memories of *Space Invaders* and a compelling need to destroy all enemy fighters while avoiding their fire. By recognizing and adhering to these similarities in design, players and developers alike saved themselves the trouble of complex game rules that would confuse players and inhibit sales.

Character branding could also be used negatively. With characters strongly tied to a certain genre of gameplay, using characters outside of that niche resulted in confusion and dismissal. Continuing the story of *Pac-Man*, Midway developed several other unauthorized games featuring *Pac-Man* and his extended family without consulting Namco. Unlike the original, *Jr. Pac-Man* had a scrolling maze twice as large as the screen with no portals to escape through. *Baby Pac-Man* featured a pinball table component, with play shifting from the maze on the screen to pinball action below when the character moved off screen. *Professor Pac-Man* left out the maze entirely, fitting the character and associated artwork into a quiz game, hoping to capitalize on the success of the genre with a character that had proven popular in his own right. That strategy failed; the *Pac-Man* name promised a maze game to players, and *Professor Pac-Man* did not deliver on that promise. For their part, Namco's own sequel, *Super Pac-Man*, also changed its design from the original, though it appeared as a maze game at first. Locked doors (opened by keys scattered about the maze) obscuring the required edibles, now fruit replacing the familiar dots. Pac-Man grew in size and could break through locked doors when he ate a super power up - but could not eat ghosts, an advantage conferred by the, original power pellet, which was still present in gameplay. Unfortunately, the changes proved too much for players, and *Super Pac-Man* did not achieve the heights of success as its predecessors. Where *Ms. Pac-Man* had improved the original formula with small adjustments, the departures from expected conventions doomed the *Pac-Man* follow-ups to a lukewarm reception, merited only by the character pictured on the cabinet.

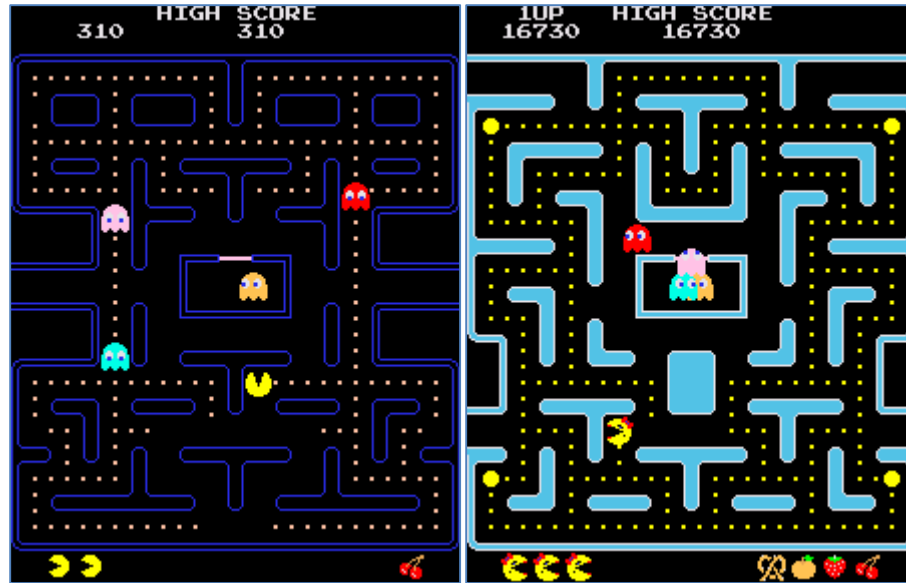


Figure 4: *PAC-Man* (left) Source: KLOV.com.

Figure 5: *Ms. Pac-Man* (right) appears very similar at a glance, and played much the same as *PAC-Man*, with only minor differences in game mechanics to distinguish them. Source: KLOV.com.



Figure 6: *Baby Pac-Man* with a miniature pinball table on the lower half of the game cabinet. Source: Strong Museum of Play.

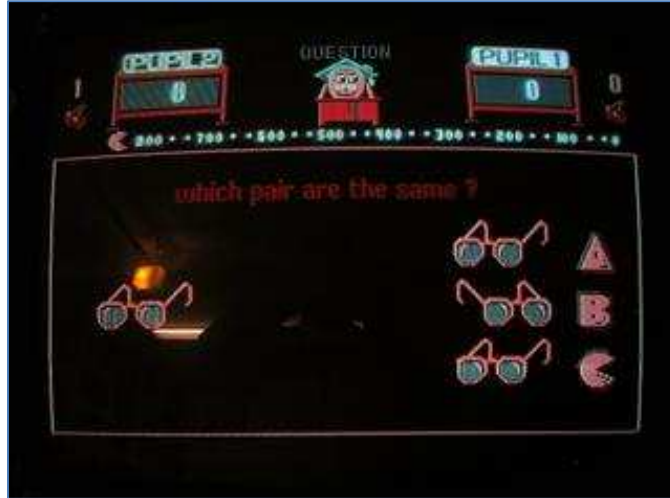


Figure 7: *Professor Pac-Man's* Pac-themed quiz game. Source: KLOV.com.

Physical Space and Display as Paratext

Beyond artwork, printed material, and the characters depicted therein, the hardware on which games run and depend influenced the experiences of the player. Raiford Guins compares the particular make-up of a game's material components as that of a classic car, as well as the caretakers of each. Machines with original components fetch more respect and a higher price from the community of enthusiasts, and secondhand parts circulate with great attention paid to the originating machine. While some elements (notably the power supply, which deteriorates or becomes unsafe with age) require replacement, other parts can be left intact or reliably installed from another machine with similar characteristics.¹³

Each cabinet manufacturer had their own ideas about construction, electrical wiring, interior layout, and circuitry. While they often followed industry trends and copied each other's style, many companies utilized the same components and design across many of their games. Designers relied on engineers to create cabinets, and these engineers in turn utilized a template that would be modified as the game's unique qualities demanded. There was no sense in reinventing the same

¹³ Raiford Guins, *Game After: A Cultural Study of Video Game Afterlife* (Cambridge: The MIT Press, 2014), 240-245, 256.

basic design, so arcade cabinets became known by their stand-up shape, which allowed players to glimpse and access the game from a standing position.

Innovative cabinet design did occur, usually dictated by the theme of the game or a unique control scheme. *Tapper*, a game where players control a barkeeper, features faux wood panels instead of the flat paint or decal stickers of most cabinets, and has a brass rail near the bottom to simulate the rail found at the bottom of many a tavern's bar. *Rader Scope*, Nintendo's early attempt to break into the American game market, has two cabinet designs: a stand-up model and another, larger model with a built in seat and dark translucent screen behind the player's chair. *Battlezone* has twin joysticks to control the player's tank in a simulation of tank controls (no steering wheels or gas pedal, much like a tank but unlike other vehicle simulations) and had a periscope-like screen, inviting players to peer inside at the alien wireframe landscape.

Unique cabinets such as these and more tell players what they are about to experience by sight and context. Players recognized the signature profile of their favorite cabinets, associating light, sound, and shape to spot a cabinet in a dimly lit crowd. Further, the cabinet displayed important contextual information to players. The military theme of *Battlezone* and *Radar Scope* informed players that they would be expected to fend off waves of enemy attackers. Similarly, *Tapper's* theme, familiar to many bar-hopping game players, reassured them that the game grounded itself in something recognizable: a friendly barkeeper, rowdy bar patrons, and the ever present corporate branding of Budweiser.



Figure 8: *Tapper's* original game design featured heavy use of its sponsor, Budweiser, both in game and on the cabinet. Later editions of *Tapper* changed the beer to root beer and removed the sponsorship in an effort to appeal to a wider audience. Source: KLOV.com.

During this time, arcade patrons saw two different graphical styles among available games. Raster graphics excelled in displaying colorful, cartoonish graphics that were easy to program and create. Examples of the style include *Pac-Man*, *Donkey Kong* and *Tapper*. However, drawing these graphics on screen consumed a significant amount of processing power, resulting in a limit for how much the screen could display at once.¹⁴ Vector graphics drew glowing beams of light between any two points in 360 degrees, allowing for the wire-frame and angled looks many associate with *Battlezone*, *Asteroids*, and *Tempest*, while it struggled to display color and could not fill the space between beams. Vector graphics consumed less memory and could rotate shapes easily without the screen needing to redraw them. This led to three-dimensional graphics that seemed positively futuristic compared to raster graphics, with the perceived depth of field drawing players into virtual space just beyond the screen.¹⁵ The choice of vector or raster graphics weighed on a game's design,

¹⁴ Mark J.P. Wolf and Bernard Perron, eds., *The Video Game Theory Reader* (New York: Routledge, 2003), 54.

¹⁵ Wolf and Perron, eds., *The Video Game Theory Reader*, 160.

as the graphic style chosen limited processing power available for game functions, set constraints on art style, and required different hardware sets.¹⁶

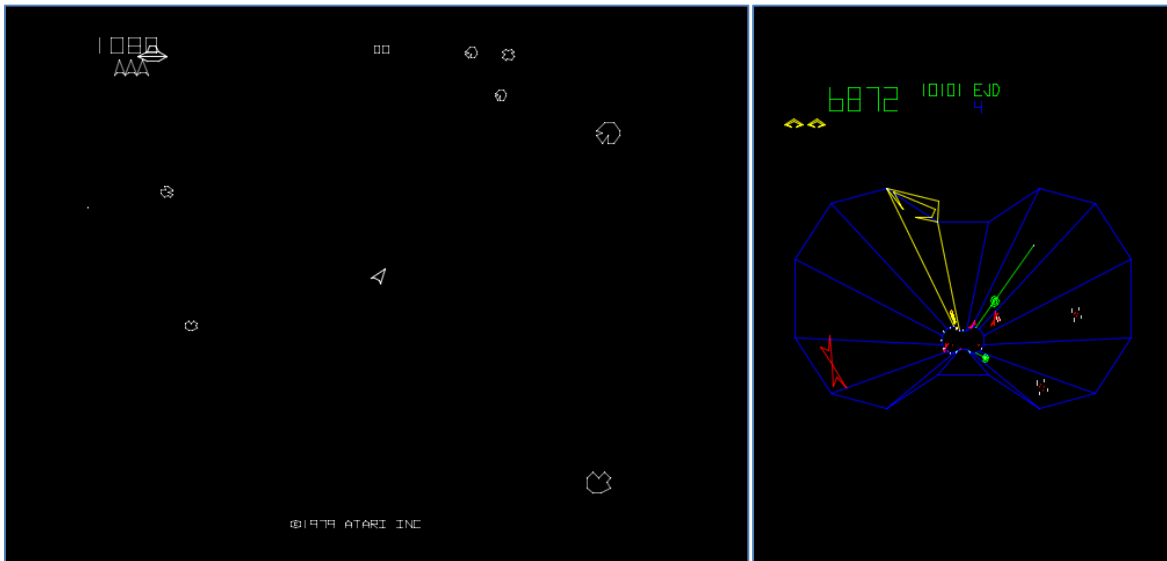


Figure 9: *Asteroids* (left) Source: KLOV.com.

Figure 10: *Tempest* (right); Both games used vector graphics as deliberate design choices. *Tempest* drew lines in such a way as to simulate a three-dimensional space. Source: KLOV.com.

Cathode-ray televisions dominated arcade game display options. Inexpensive and able to accept a wide variety of programming commands, CRTVs glowed with a warm inviting light. This made the objects on screen easy to discern against the darkness of a blank background, or at least against the dull wood case surrounding the screen.¹⁷ The screen's light could also result in a "burn-in" image if left displaying one image too long. These ghostly afterimages inadvertently decorated many well-worn arcade screens, signaling heavy play - or poor design. Games with static backgrounds suffered this fate most often as well as games with a simple inactive state, displaying a title or high score board while waiting for a new player. The threat of burn-ins ruining many screens may have contributed to the popularity of the game running in "attract" mode.

Attract modes offered a way for the game to show off, bringing the dormant machine to life without the use of a quarter. Early games did not have attract modes, as they required precious

¹⁶ Donovan, *Replay: The History of Video Games*, 82-83.

¹⁷ Wolf, ed., *Before the Crash: Early Video Game History*, 191.

memory and system resources that could otherwise be used for gameplay; cabinets attracted enough attention on their own, standing out as a strange new object for curious onlookers. Originally functioning as a screensaver to avoid burn-in images, the screen usually displayed a cycle of title screen, high scores, or colorful lights. Developers soon programmed pre-recorded demonstrations of game play utilizing system graphics and a program for the game to execute on its own, simulating someone at the controls. With memory limited in earlier games, most could only afford to flash the high score board, daring players to earn a place in this miniature hall of fame. As computing power increased and games switched from mechanical to digital models of circuitry, games could offer a short demo of preprogrammed play, a game in action to assuage players of their fear of the unknown and offer a glimpse at what awaited players.¹⁸

The cultural space of the arcade functioned as paratext as well. Decorative choices and neon lighting aside, arcades tended towards dim lighting, in order for backlit displays and screens to shine brighter in the darkness. The glow of CRTVs and other amusements created a dreamlike atmosphere, or a potential den of sin untouched by morality's light, depending on who was asked. Parsing this crowded, busy environment necessitated a trained eye adept at identifying symbols and information through the racket and light show.¹⁹

In a room often crowded with many options for gameplay, a successful game needed to draw a player's attention in order to get him to play. Cabinets with attractive colors, a clever title, or a novel cabinet design had an instant advantage. Before a player dropped a quarter, he would have little knowledge of the game at hand, apart from observing another player at the controls. One player's experience and reception of gameplay differed from another, considering the levels of skill and random elements at work in a game.

Game players preferred certain styles, genres, and aesthetic elements over others. Designers and marketers could not take every player's tastes into account, so they utilized trends with wide appeal. Space, Wild West, and military themes predominated early arcade titles. A certain

¹⁸ Donovan, *Replay: The History of Video Games*, 57.

¹⁹ Wolf, ed., *Before the Crash: Early Video Game History*, 191, 197-198.

amount of abstraction, necessitated by the limits of graphical hardware, allowed for strange, weird, and bizarre characters and concepts to exist in the same space as worlds that took their cues from the reality outside the arcade.²⁰

Further, games could also display non-interactive segments describing the setting, story, and characters involved in the game. Though not necessary for good gameplay, these additional elements revealed design choices and established unwritten rules and expectations for the game itself. Given that their expectations for the game were informed by prior experience, players believed certain objects operated in a certain manner. and could take solace in this through their experience with the paratext surrounding the game. For example, a game with a medieval theme did not feature cars, jet packs, or other futuristic anachronisms. Medieval games meant armor, swords, horses, and conflict, perhaps with magic, dragons, and other fantastic elements. Paratext informed expectations and establishes a connection to the game before a round of play. Deviations from that paratext invited frustration, broken expectations, and confusion over how to proceed. In this event, an increased focus on the paratext and its failure to accommodate players superseded the game's design. Paratext supported the larger text of gameplay, rather than making itself the focus. Poor paratext elements could be overlooked for the sake of a great gameplay experience, but bad game design dragged everything down with it.

Learning and Mastering

Games were pointless if no one understood the rules, though game designers had precious few opportunities to pass along knowledge to the players. The sides of the cabinet provided a space to instruct players in the rules of the game. Developers displayed basic instructions, goals, controls, and point values of targets in small boxes along the edges of the screen space and by the controls. Buttons labeled "Fire" "Hyperspace" and "Start" implied their function to players. However, careful cabinet design remained ineffective in the dim lighting of most arcades, making the instructions difficult to read. Moreover, some players simply ignored them, eager to start the game. Veteran

²⁰ Wolf and Perron, eds., *The Video Game Theory Reader*, 55-59.

players passed by without worry, relying on skill and other paratext clues to guide them through. Novices confronted by an unusual or complex first experience grew frustrated quickly, feeling they had been duped into spending their money on an impossible challenge. While most arcade games intended to take their patron's money, they also needed to cultivate an appropriate level of challenge. No one liked a game that cheated, especially when that only became apparent after depositing a coin in the slot.²¹

To help with frustration at the game's mechanics, developers used the attract mode of games to demonstrate the game in action. These short computer controlled demos showed how the game functioned, examples of player and enemy movement, and other observable information that could not be adequately shown from a static image. Observant players also gleaned viable gameplay strategy that they could use in their next attempt at the game. Canny developers revealed secrets in the demo, such as a hidden room or a difficult maneuver, tempting players further to act on that newly acquired information by inserting a coin.²²

Strategy guides and hint books offered another means to learn the secrets of the pros. Following the advent of high score boards, these guidebooks promised readers a spot in the local hall of fame.²³ Given that games could be played any way the program allowed, and considering the unpredictable nature of most arcade games, there was rarely one true path to success. Still, certain elements of the game could be predicted and taken advantage of by knowledgeable players.

For example, in *Pac-Man*, patterns of play existed that allowed players an advantage.. The ghosts chasing the player had behaviors that were not readily apparent in the game's instructions, or even after several play sessions. One ghost chased Pac-Man relentlessly, another avoided him, and another worked its way along side routes. Knowing this, a careful player could spot a ghost and, knowing about its behavior from the guide, attempt to avoid it with more success than a novice. Due to these behaviors and the ghosts always starting out in the same direction, players eventually

²¹ J.C. Herz, *Joystick Nation: How Videogames Ate Our Quarters, Won Our Hearts, and Rewired our Minds* (Boston: Little, Brown and Company, 1997), 52.

²² Consalvo, *Cheating: Gaining Advantage in Videogames*, 31.

²³ Consalvo, *Cheating: Gaining Advantage in Videogames*, 44-46.

worked out "patterns" or a certain path through the maze that would enable Pac-Man to avoid all the ghosts while clearing the maze. Memorizing these patterns and putting them to work ensured a successful play through.

Tip guides ran a brisk sale through the arcade era. They existed for nearly every hot game. The more popular games had several competing guides, with the higher end ones featuring photos, interviews, maps, and other aids in learning the material. These guides were authored by expert players and published by large presses. Their success carried over to home games as well. The purpose of strategy guides at home shifted from obtaining a high score or prolonging one's quarter to successfully completing the game and finding all of its secrets.²⁴ Home games became more intricate and complicated due to the lack of time pressure and the need for developers to "encourage" players to lose all their chances and therefore put another quarter in. As the games changed, the focus of the guides adapted to match.

Atari produced a magazine named "Atari Age" which went to all member of the Atari Club, a fan club of the company. The magazine only covered Atari products and events, offered exclusive deals to its readers, and served as an advertising and merchandise outlet for the company. Atari knew its readers had a passion for their product already, and used the magazine as a way to build brand loyalty.²⁵ The articles extolled Atari games and lavished them with praise, regardless of their comparison to similar products from competitors. Atari Age and other magazines like it, such as the later Nintendo Power, never claimed to be fair or unbiased. The consumer's loyalty had already been foreclosed upon by their purchase of the magazine or fan club membership, and so the space within dedicated itself to the selected brand.

Games in the late 1970s and early 1980s evoked many themes in an effort to attract player attention. The theme of a game depended on its game design. As mentioned previously, a game's theme and design had to share congruent features in the mind of the player, or it would not make sense to the player. Space and cartoon themed games ignored the rules of the real world, as there

²⁴ Consalvo, *Cheating: Gaining Advantage in Videogames*, 51-55.

²⁵ Guins, *Game After: A Cultural Study of Video Game Afterlife*, 45.

was no way for players to project themselves into such experiences. Games with a setting that players recognized, such as *Crazy Climber*, *Donkey Kong*, and *Battlezone* had to meet their expectations for such environments. Things that jumped fell back to earth in an arc, tanks fired deadly bullets, and gravity affected everything in some manner. In this way, players imported their own expectations from other life experiences onto a game they knew little about - aside from the paratext.

Paratext in Service of Narrative

Paratext had the power to provoke a strong response from a wide audience. Perhaps the first video game to inspire controversy, *Death Race* allowed two players to steer a small car around a field, attempting to run over gremlins, which left a little grave marker where the player had careened into them. With low-resolution graphics, the game could not differentiate between gremlins and humans; the image on-screen was a simple stick figure. The end result looked suspicious enough that concern arose that the gremlins represented humans, and that the players actually engaged in a murder simulator. Sparking a series of cautionary tales and investigations into the psychological impact of video games, *Death Race's* infamy persisted despite the low number of machines produced; fewer than 100 survive today.



Figure 11: An arcade flyer for *Death Race*, claiming the targets are monsters. Source: MobyGames.com.

Death Race's paratext made it a target ripe for criticism. However, the gameplay, when deconstructed, requires players only to move from one point to a marked spot on the screen, earning points for doing just that. The designer might have used coins, apples, signs, or any symbol besides a stick figure and grave marker to create the same gameplay. Using violence as a framework for the gameplay, the game invited its criticism - though games had used pixilated violence before, few dared to place human-like figures in harm's way, especially as targets for the player. The choice to use *Death Race* as a title and deadly cars in the motif may have had as much to do with the recent release and success of the cult film *Death Race 2000*.



Figure 12: The backplash art for *Death Race*, emphasizing the macabre setting of the game. Source: KLOV.com.

The military's influence on culture reached into the arcade during the last decade of the Cold War. The increasing aggression of the USSR marked by the invasion of Afghanistan resulted in a strong national defense policy and aggressive foreign policy during the 1980s, signaling the end of the relative calm of détente politics under Presidents Nixon and Carter. Military themes lent themselves to games with ease. A simple objective of "destroy all enemies" meant less chance of confusion on the part of the player. Though arcade game makers avoided most forms of flag waving jingoism in their themes in order to maintain broad appeal, several popular games borrowed from Cold War fears in their design.

Missile Command played on the perpetual worry that American cities would be destroyed by enemy bombers or long range missiles, and coupled it with the hope placed in missile intercept defense systems. From the beginning, *Missile Command* tied itself to the continuing Cold War, as designer Dave Theurer recalls:

[Game design leader Steve] Calfee called me into his office and said, "Dave, we have something we want you to work on next. We want you to explore the idea of the U.S. being invaded by the USSR. We want your game to have this radar screen that shows missiles coming in." I walked out of his office and my spine was tingling because I just had this feeling that this was going to be fun and it was going to be hot. It was so relevant - that was in the

middle of the Cold War. I just had this really, really good feeling about it. . . I just sat down and drew up a basic game idea, which is pretty much the way it turned out, except we got rid of the radar screen because that was too distracting. I hate radar screens because you can't see what's going on half the time.²⁶

Players protected six friendly cities at the bottom of the screen from enemy bombers and missiles. Using a trackball controller to aim a cursor into the skies above the cities, players fired missiles from three missile batteries that would explode when they reached their target, destroying any missiles, bombs, or planes caught in the blast radius. Missile batteries could be destroyed or run out of missiles, and the game ended only when all six cities were destroyed. Theurer originally intended to add in elements like missile delivery via railroad, submarines, and the ability to have city names varied by region, but limitations of the hardware prevented these extra Cold War elements from being included in the final version.²⁷

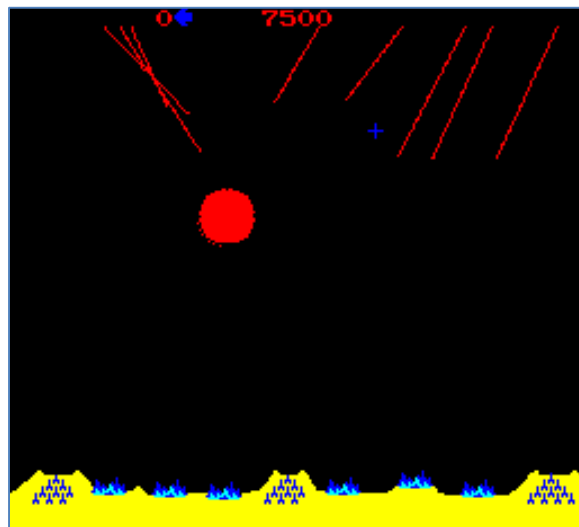


Figure 13: *Missile Command's* playfield. Source: MobyGames.com.

²⁶ Kent, *The Ultimate History of Video Games*, 138-139.

²⁷ Kent, *The Ultimate History of Video Games*, 139.



Figure 14: The cabinet for *Missile Command*. Source: Strong Museum of Play.

While gameplay itself constitutes the text rather than paratext, the lengthy description above illustrates the stark military influence on the game. The setting parallels American fantasies of nuclear holocaust and the reality of long-range warfare. Cities obliterated from above signified a sense of helplessness, with only government defense missiles to protect them in explosive fashion. In a grim twist, the player's game did not end if all missile batteries had been depleted or destroyed; rather, they watched helplessly as the game destroyed their cities without resistance, flashing a message onscreen "THE END" as a dark reminder of the game's theme of destruction.

Atari had an earlier success in war games with the release of *Battlezone* in 1980. Players assumed the role of a tank operator in an alien landscape, complete with an erupting volcano and flying saucers. Looking through a periscope lens on the arcade cabinet placed the player in the cockpit of the tank, allowing them to see the wireframe landscape displayed in vector graphics. Players aimed for a high score by hunting down enemy tanks and dodging incoming fire. Though the game drew upon militaristic themes, it did not attempt to duplicate real-world conditions. Apart from the fantastic setting, tank shells traveled slowly and without regard to gravity or wind, and the vehicle designs did not reflect contemporary military equipment.

Later that same year, Atari attempted to transform *Battlezone* into a military-grade simulator. After being approached by several former Army generals who planned to license the simulator, Atari

tasked *Battlezone* programmer Ed Rotberg with upgrading the game to meet the standards of their clients. Rotberg reflects on what this change meant for the game and his personal views:

I didn't think it was a business that we should be getting into. You've got to remember what things were like in the late 1970s, and where those of us who were in the business came from - our cultural background. There were any number of jobs to be had by professional programmers in military industries or in military-related industries. Those of us who found our way to video games . . . it was sort of a counter-culture thing. We didn't want anything to do with the military. I was doing games. I didn't want to train people to kill . . . The changes were extensive. First of all, we were not modeling some fantasy tank, we were modeling an infantry fighting vehicle that had a turret that could rotate independently of the tank. It had a choice of guns to use. Instead of a gravity-free cannon, you had ballistics to configure. You had to have identifiable targets because they wanted to train gunners to recognize the difference between friendly and enemy vehicles. So, there were a whole slew of different types of enemy vehicles and friendly vehicles that had to be drawn and modeled. Then we had to model the physics of the different kinds of weapons.

Atari's changes allowed for the paratext of the game to shift from fantasy to reality. By avoiding overt references to American settings and not directly naming the combatants or their objectives, *Missile Command* allowed players to interpret the game as either science fiction fantasy or a morbid reflection on the futility of war. The new *Battlezone* - dubbed the *Bradley Trainer* after the intended class of vehicle to be piloted - did not leave much to the imagination. The tanks were real, the ballistic calculations as accurate as could be, and the intent of the game unmistakable. In the arcade you could aim for a high score and try again with an extra quarter, but on the battlefield it was kill or be killed, with no extra lives, only more soldiers to take your place.



Figure 15: *Missile Command's* ominous ending screen. Source: Mobygames.com.

Social and cultural assumptions made their way into games through paratext as well. The image of a damsel in distress provides motivation for players to progress through *Donkey Kong* and *Dragon's Lair*, as if defeating the game's arch villain were not enough to do. The villains have little reason to capture or hold the lady in peril, beyond antagonizing the hero. Women rarely appeared in arcade games at all during this time period, except as props or plot devices. The presence of female characters indicated a passive, friendly presence which would not harm the player and might bestow some gift upon the player.

When games developed narrative, they needed a framework to sustain that narrative structure. Though game plots may seem flimsy compared to works of literature, paratext support allows clever designers to provide context clues as to a player's motivation to continue their quest. Due to the limitations of memory, these hints of structure came from outside the game program. However, once game cabinets moved toward larger memory capacity, their programs could hold more lines of code. Designers began to experiment with this expansion of space, especially elements that were not crucial to gameplay.

In the case of *Donkey Kong*, players find themselves treated to a short non-playable portion just after pressing "Start". Once the game begins, Donkey Kong climbs to the top of a set of red construction girders of a half-finished building with his captive Pauline under his arm. He safely places her atop the structure, then stomps the structure into a deformed set of ramps, crippling ladders and preventing easy access. He grins at the screen, taunting the player. The screen cuts to a short message "How high can you climb?" - the player's presumed objective - before starting the player off on the first screen. Donkey Kong remains in the position he occupied at the end of the introduction, as does Pauline. Mario has arrived at the bottom, along with numerous gameplay elements - the scoreboard, hammer power-ups, and a more detailed ladder layout - but the parallels to the introduction remain clear. The player guides Mario to climb to the top of the structure to save Pauline and effectively "win" the scenario laid out by the game's first fifteen seconds.²⁸

²⁸ Chris Kohler, *Power-Up: How Japanese Video Games Gave the World an Extra Life* (Indianapolis: Pearson Education, 2005), 25.

In this way, Donkey Kong's paratext directed players to care for more than the high score board. Drawing on well-worn tropes in narrative structure, characters present themselves in heroic and villainous roles (and in the maiden Pauline's case, passive object) that were instantly recognizable. While *Pac-Man* and its sequels also had interstitial cutscenes, they did not clearly delineate a narrative structure around which the game was based, nor were they played at the beginning to set the stage. With the cutscenes inaccessible until the player had cleared several rounds of play, *Pac-Man*'s scenes were brief rewards, rather than background information. By that point, the player had developed the skill to ignore narrative and focus on the gameplay - the main text.²⁹

Donkey Kong's narrative elements drew players into the main text of gameplay and provided a framework for the game's elements. The story of Mario, Pauline, and Donkey Kong became redundant after the first few times through the game's looping cycle of levels, as the beginning and end played out exactly the same. There were extra boards to clear in between, however, one added each time through the game to a maximum of four. After that, the game's difficulty increased, challenging expert players in a familiar manner: punishing action sequences broken up by brief periods of rest. Though the run-and-jump style of game became popular thanks to Mario's rooftop heroics, what truly made Donkey Kong different was the simple narrative structure surrounding the game and its expression to the player.

Unfortunately, these same narrative structures drew the eye of Universal Studios. Universal's cursory examination of the video game market revealed *Donkey Kong* and its giant ape, which seemed too close to King Kong for the studio's patent lawyer to abide. After filing suit against Nintendo, Universal expected the upstart Japanese company to back down. Nintendo's legal counsel, Howard Lincoln, researched the case and persuaded Nintendo to take the case to court.

Universal believed their case airtight. They considered *King Kong* one of their franchise attractions and had successfully defended their rights to the film for years. Although their pursuit of copyright infringement ignored smaller companies' occasional use of a large gorilla, *Donkey Kong*

²⁹ Kohler, *Power-Up: How Japaneses Video Games Gave the World an Extra Life*, 27.

had quickly grown in popularity and garnered national attention. Merchandise and marketing focused on Nintendo's newest star, which in turn convinced Universal to acquire or destroy *Donkey Kong* before it posed a threat. The narrative structure of *Donkey Kong* drew heavily on *King Kong* for inspiration, which made it appealing to consumers who could easily confuse one for the other. Even without possessing a degree of video game aptitude, a layman could grasp the paratext of the game, which lay at the crux of the case.

Nintendo's legal team directly challenged Universal's claim to the *King Kong* trademark. Instead of attempting to prove that *Donkey Kong* differed in significant ways, Nintendo instead dared to say that Universal had no claim over *King Kong* in the first place, and thus the suit over narrative matter was irrelevant. Before the trial, when asked to provide a chain of title to secure its copyright claim, Universal had instead issued more legal threats to Nintendo. In court, Nintendo referred to an earlier case in which Universal itself argued that *King Kong* was in the public domain and therefore free from any copyright claim. Universal had since acted as the *de facto* owner of *King Kong*, using its intimidating legal department to bully other users of *King Kong* into submission.

The entire case hinged on Nintendo's use of paratext overlaying its game. While Universal aggressively pursued its case against Nintendo, it had also contacted several subsidiary users of *Donkey Kong*, including Tiger Electronics. Tiger had planned to develop and release a handheld electronic game of *Donkey Kong* under license from Nintendo. Universal examined Tiger's prototype and demanded that Tiger change the paratext of the game or face a costly legal battle. Tiger complied, giving the protagonist a fireman's hat, altering the barrel obstacles into bombs, and renaming it *King Kong* - with Universal's blessing, in exchange for a cut of the profits.

The courts found in favor of Nintendo,³⁰ and its countersuit against Universal's hypocritical admission of the Tiger Electronics version of the game was upheld as well.³¹ In this case, the paratext of the two games worked as a double-edged sword. Nintendo's use of *Donkey Kong* as a narrative element did not resemble *King Kong* enough to justify Universal's suit, to say nothing of Universal's

³⁰ Universal City Studios v. Nintendo Co., 578 F. Supp. 911 (S.D.N.Y. 1983)

³¹ Universal City Studios, Inc., Plaintiff-appellant, v. Nintendo Co., Ltd., Nintendo of America, Inc., Defendants-appellees, 746 F.2d 112 (2d Cir. 1984)

empty claims to a trademark they did not possess. However, Tiger's attempt to ape Nintendo's game design and hide it with a coat of Universal-approved paratext did not shield them from the countersuit that they had stolen the major text of Nintendo's work, the fundamental gameplay of *Donkey Kong*. Paratext had its limits, and could not disguise the main text of the game, only inform and elaborate upon them. Popular elements of a game's paratext, like characters and setting, could also take on a life of their own, and go on to form texts independent of the original game.

Merchandise and Marketing

The cartoon world of Pac-Man crossed over into the mainstream culture in a way Space Invaders, Pong, and other abstractions were unable. By possessing a central, named protagonist with humanized qualities and a modicum of a story, Pac-Man became a pop culture icon of the arcade. In addition, Pac-Man crossed market demographics. Serious arcade aficionados appreciated the challenge of a high scoring game of Pac-Man as much as others found themselves drawn to the bright cheery colors and cute character designs.³² The design of the character lent itself to serious merchandising efforts as well, which only expanded with the release of Ms. Pac-Man and other members of the "Pac-Family" in subsequent years.

Pac-Mania swept over America. Pac-Man toys, lunchboxes, posters, collectible figures, and t-shirts signified brand identification, if not outright loyalty. An animated TV show appeared on another type of screen at home, expanding the scope of the universe and the brief narrative, albeit one far removed from the simple arcade action of munching pellets. Even a song written about the craze, "Pac Man Fever" climbed record charts and earned radio play. As a result of the character's recognition and relentless marketing since then, Pac-Man remains highly recognizable to this day.³³

With Pac-Man making money outside the arcade, game design took a turn toward character driven cartoon mascot games. Pac-Man's basic design of a maze became its own genre as it was replicated over and over in search of the same breakout success. With improvements in graphical

³² Kent, *The Ultimate History of Video Games*, 143.

³³ Kent, *The Ultimate History of Video Games*, 144.

hardware, screens rendered more complicated character designs in color, allowing for wider recognition among audiences. Sound and music improvements also increased the quality of the experience outside of the core gameplay, with recognizable tunes and melodies playing when players started, finished, or failed at a game, marking another point of recognition.³⁴ The enduring fame of mascots like Pac-Man and Mario testify to the power ascribed to a mascot, even when removed from the original game.

The anonymity of artists responsible for cabinet art, box art, and other supplemental artistic material called into question the value placed upon these visuals by the game companies. A common practice involved asking the developers to create art, no matter their level of skill or experience, when necessary for advertisements or display. The disconnect between hand-drawn art and graphics on screen allowed for relaxed standards of quality in the art, leaving artists "internal" to the company room to work. Owing to a lack of individual credit given in companies, any work done by developers outside of their preferred discipline or job title fell under the umbrella of "making a game" and did not warrant extra attention - or overtime pay.³⁵

When outside artists contracted with companies to create art for games, this practice of anonymity extended to them as well. Some artists did not mind. Working on art for games may have seemed crude and commercial compared to their usual jobs or creative output, and they welcomed the anonymity. Curiously, the non-importance of the artist's identity allowed other artists to copy a particular style, then outbid and swipe an artist's contract with a company. Such was the case with Cliff Spohn, the primary artist for Atari's home video game library. After illustrating the dynamic box art for the Atari VCS launch titles *Combat* and *Air-Sea Battle*, Spohn recognized his own worth, and asked for a raise. Undaunted, Atari hired another artist, Steve Hendrickson, who then called Spohn and asked for artistic advice without specifically explaining the situation. Spohn's emblematic design

³⁴ Mark J.P. Wolf, *The Medium of the Video Game*. (Austin: University of Texas Press, 2001), 144.

³⁵ Guins, *Game After: A Cultural Study of Video Game Afterlife*, 105.

work carried such weight that Atari imitated it in-house, while other game companies also attempted to poach the style of Atari's megahit game box cover designs.³⁶

The corporate culture at Atari created an image of fun loving free spirits working to bring that same level of excitement and passion to the consumer. Nolan Bushnell's love for publicity ensured numerous tours and open houses of the Atari complex, where it was plain to see employees smoked, drank, worked and played all under the same roof. Bushnell encouraged fun and promoted a "do as you please" attitude for his employees, living a fast lifestyle himself.³⁷ Atari's corporate culture supported the idea that fun products came from fun people, and Atari seemed to prove the point with hit after popular hit.

This culture changed after Atari's acquisition by Warner Entertainment. The "West Coast culture" at Atari clashed with the "East Coast suits" sent to manage the game makers. Warner had been lured to Atari by the promise of profit, not fun. Bushnell's loose management style resulted in his release from the company he founded by 1978.³⁸ Bushnell went on to manage a series of businesses, including a chain of pizza restaurants that featured large arcades and family entertainment, known today as Chuck E. Cheese's.

The Crash

Beginning in 1982, the bottom fell out of the home game market. This happened for a number of reasons, though their confluence seemed remote at the time. Home game technology seemed to have stagnated; graphics, memory, and sound changed little from year to year. Meanwhile, the nascent desktop computer market grew exponentially, with processing power and graphical output to match the industry's rising influence and effectively combat the notion that the home game should be the most powerful electronic device in the house. Moreover, Atari's fortunes, the figurehead of games in arcades and at home, turned grim. Nolan Bushnell, the charismatic founder, had been let go amid a corporate takeover. Atari's business remained high, and made up over half of its new parent

³⁶ Guins, *Game After: A Cultural Study of Video Game Afterlife*, 197.

³⁷ Donovan, *Replay: The History of Video Games*, 70-71.

³⁸ Donovan, *Replay: The History of Video Games*, 70-71.

company Warner Entertainment's business revenues in 1982. A flood of sub-par games published by quickly financed start-up companies³⁹ hoping to take advantage of the video game market saturated the market with low-quality games. As these companies expanded, then imploded under the weight of their own success, retailers stuck with their inventory priced them to move quickly in the bargain bin, leaving consumers with the impression that all video games had been devalued. When Atari's forecasts for the upcoming year sounded less optimistic than expected, the news sent toy markets and retailers into a panic. Poor reception amid poor reviews of the latest line of Atari cartridges further dampened the market for Atari games, especially *Pac-Man* and *E.T.*. Having already spent a colossal amount of money on licensing and advertising, the high-profile and high cost failure destroyed Atari's hopes for recovery, and its home game and arcade game divisions were split up and sold off to different investors.⁴⁰

The town of Alamogordo, New Mexico, had been resting peacefully for forty years following the Trinity nuclear bomb test in the last year of World War 2. Its solitude, small size, and the presence of a landfill brought it to the eye of Atari executives in 1983 desperate to unload excess inventory.⁴¹ Atari sought to liquidate its unsold game cartridges, returned by retailers following the dismal holiday shopping season in 1982. Having grown weary of shoddy games following the highly anticipated but poorly designed home version of *Pac-Man*, consumers rejected Atari and its flagship title for the season, a game based on the summer blockbuster *E.T. the ExtraTerrestrial* by Steven Spielberg.

Atari had secured the rights to *E.T.* after its massive success that summer, and ordered a game be produced in time for Christmas. Atari CEO Ray Kassar remembers the difficult task:

I asked Steve [Ross, CEO of Atari's parent company Warner Entertainment], "When do we have to produce this?" He said for Christmas of 1982. This was in July when he called me, the end of July. I said, "Steve, the lead time to produce a game is at least 6 months between semiconductor deliveries and programming and all that. It's impossible." He said, "Well, you have to do it because I promised Spielberg we'd have it on retail shelves for Christmas." We had literally six weeks to produce a brand new game, manufacture it, package it, and market it. It was a disaster. I mean, the programmers hated it. Nobody liked the game. Then he [Ross] ordered us to produce almost five million of these games. I told him, "Steve, that's crazy. We never make five million of a product until we have some market testing." He said,

⁴⁰ Kent, *The Ultimate History of Video Games*, 155.

⁴¹ M.E. McQuiddy, "Dump Here Utilized," *Alamogordo Daily News*, September 25, 1983, section A

"Well, it's going to be a big hit because of Spielberg and *E.T.*" So we made five million and practically all of them came back.⁴²

The hastily designed game inspired rage and confusion, rather than the joy and wonder experienced by viewers of the *E.T.* film. The millions Atari spent on advertising did little to budge the game from shelves. As a result, the company went into a tailspin, dragging the rest of the home game market down with it. Left with nearly a million unsold games and public scorn, the company had few options. Atari opted to bury its excess inventory in the desert landfill, claiming everything dumped no longer worked or was otherwise worthless. Scavenging locals reported working games, some new in the box, but the relentless dumping of new garbage on top of old garbage soon forced the games underground, where they remained for thirty more years.

The myth of the Atari landfill persisted, swirling through video game enthusiast communities as a warning against the previous excesses of the industry and a grim warning of hubris. *E.T.*'s infamy as Atari's great failure hung in the air, an albatross around the neck of video games, even as the industry slowly rebuilt itself through the decades. The game, considered by many to be the worst ever made, earned that reputation not through lackluster game design, but by its regular inclusion in histories of the industry where it was the subject of whipping and pillory by historians and enthusiasts indignant that one game had doomed the home game market and, to some extent, the arcade game market as well to financial ruin and near-destruction.⁴³

Years after Atari dumped their waste, in 2014 video game fans demanded answers. The exhumation fell to Fuel Industries, a Canadian company filming the ordeal as part of a documentary on video games. The games were indeed within the landfill, though less than one percent of the estimated total within made it out of the ground. *E.T.* was not the sole occupant of the tomb, as many more Atari games, both popular and forgotten, came to light once again. Their cardboard boxes remained recognizable, with instruction manuals and cartridges sealed inside the laminated paper

⁴² Kent, *The Ultimate History of Video Games*, 238.

⁴³ Guins, *Game After: A Cultural Study of Video Game Afterlife*, 207-208.

sleeve. Preserved within the earth, these items went to museums, fundraiser auctions, and private collections as artifacts of another time and as memory of a near-death experience for video games.⁴⁴

The death, burial, and unearthing of *E.T.* allowed its meaning to shift over time. The text of *E.T.*'s gameplay remained the same all the while. Atari unloaded excess inventory that was worth pennies on the dollar, reducing it from pricy consumer good to trash as a matter of expediency. Few people that heard of *E.T.* and voiced opinions on it over the intervening three decades had a chance to play it, and instead concluded that *E.T.*'s poor design brought down Atari, the titan of the game industry, based on what they read and heard from other game enthusiasts. *E.T.* may have designed in haste without an eye for long-lasting quality, but its reputation preceded it. Game lovers created and replicated the legend without the game's wide availability. Once the game resurfaced, its meaning changed again into a collector's item.

Following the climactic crash of the home game market in 1983, home games lost much of their marketability. Toy shops, the primary retail outlet for home games, stopped giving shelf space to consoles and games, reducing their inventory in anticipation for a new fad. While every company selling games did not fold up and go bankrupt in a single year, the crash left only the firms large enough to weather years of losses with any interest in video games, and none appeared to have a clear path forward. Atari planned to release an updated version of their flagship home console that would compete with home computers. Mattel and other toy companies left the business, considering it too risky and volatile. Arcade owners waited patiently for new games to come from what companies remained, counting on their installed machines and the goodwill generated before to carry them through. Journalists wagged their fingers at the declining industry, proclaiming the video game's day to have passed.⁴⁵

Nintendo's Gambit

The atmosphere of subdued halcyon days - a golden age brought down by greed - confronted Nintendo as it attempted to launch the American version of its own home game system,

⁴⁴ *Atari: Game Over*. Directed by Zak Penn. USA: Fuel Entertainment USA, 2014

⁴⁵ Donovan, *Replay: The History of Video Games*, 107-108.

the Famicom. Finding no room to maneuver in the American market, the Japanese company faced a daunting challenge of convincing retailers and consumers that its product could shake the weight of previous industry failures and reestablish home games as a power player, with Nintendo at the center of the industry. Having been burned once before, toy retailers rejected Nintendo's requests for shelf space, seeing the unproven company as another pretender to the empty throne. Their appearances at trade shows resulted in jeers and skeptical pity, with industry veterans advising Nintendo representatives that the video game could not sell like it had in the past. Without shelf space at stores or any support from a position in the industry, Nintendo could not market the Famicom to consumers at all, though they expected the same tepid reception from wary American consumers anyway.⁴⁶ To counter this, Nintendo adopted a bold strategy.

Nintendo changed the fundamental of conversation surrounding their new system through marketing and corporate control. They insisted on labeling the Famicom as the "Nintendo Entertainment System" (NES) to emphasize its difference from home computer, its major competition in terms of processing power and graphical capabilities. Strategic rebranding occurred throughout Nintendo's marketing to set the system apart from the still-toxic memory of "video games" and "consoles" in the minds of consumers. Instead, Nintendo used terminology like "Control Deck" to refer to the console, "power pack" for the bundle of controller and console, and "Game Pak" for the cartridge games themselves. These and other euphemisms referred to products which consumers were already familiar. In a departure from the standard set by Atari, they offered to buy back any unsold games and consoles from retailers, not just recover the merchandise and dump it in a warehouse. Retailers felt as though they stocked Nintendo products risk-free.⁴⁷

Nintendo, in turn, shifted that risk and responsibility onto the developers themselves. Unlike the legal scuffle between Atari and Activision, Nintendo embraced the idea of other companies making games for its system, as long as they followed Nintendo's rules. To ensure quality and avoid the sub-par catalog of Atari's later years, Nintendo had final control over what games were published and allowed on the system. This meant a certain level of censorship for mature themes and

⁴⁶ Kent, *The Ultimate History of Video Games*, 281.

⁴⁷ Donovan, *Replay: The History of Video Games*, 166.

iconography, as Nintendo wanted to market their system to children (and their parents) without controversy. Developers also faced a limit of three games per year to avoid flooding the market with games and devaluing Nintendo's brand through excess. The limit also served to force developers to take more time on each individual game. To ensure compliance with their demands, Nintendo's game format included a "lock and key" security measure, whereby only approved Nintendo cartridges would have a special chip inserted into their hardware. The NES had a similar chip, and would only load games recognized by this lockout chip. Officially licensed games had Nintendo's Seal of Approval prominently displayed on the package and Game Pak; its presence acted as a reassurance to consumers and a warning to potential pirates.⁴⁸ The foresighted marketing and control over software for the NES may have secured the market in the longterm, but Nintendo still needed a way to break into the American market.

With some retailers still expressing reluctance to trust a video game system again, Nintendo's final gambit played directly to the toy market's expectations. In order to get toy stores to stock their product for the holiday season, Nintendo packaged the Deluxe System bundle with a wireless robot nicknamed "R.O.B." for Robotic Operating Buddy. With a color scheme to match the NES and a small suite of accessories designed for its unique use, R.O.B. looked like a toy that required the NES to work properly. R.O.B. operated independently of the player, accepting commands from the game controller and signals from the TV screen. Only two games, *Gyromite* and *Stack-Up* worked with R.O.B., and *Gyromite* was included in the set. Thus, to retailers, the R.O.B. bundle appeared to be complete, and would not require the large amount of shelf space that Atari and other consoles demanded for their systems and attendant cartridge collections. Consumers likewise saw the item as a single purchase for the holiday season. While both groups may have recognized a video game console, R.O.B.'s presence created the idea that the NES was the key to a new *system* of television entertainment, of which R.O.B. and video games constituted parts of a greater whole. People may have bought the system due to R.O.B.'s inclusion, but they kept the NES due to the expanding lineup of games that soon followed the American launch, while R.O.B. fell by the wayside, its gimmick having served its purpose.

⁴⁸ Kent, *The Ultimate History of Video Games*, 289.



Figure 16: The Nintendo Entertainment System with Zapper light gun on the left, and R.O.B. on the right with the Gyromite set of accessories. Source: Steve A. at Nerdko.com.

With the American launch, Nintendo challenged the narrative of the failed video game industry through the paratext surrounding their new system. Consumers and retailers believed several things about the NES before playing a single game. R.O.B. masked the NES's purpose as a new generation of game systems, instead fooling skittish retailers into accepting what they believed to be a new toy fad for the holiday season. The use of jargon such as Control Deck and Action Set allowed Nintendo to escape the preconception that all video games looked and sounded alike, permitting the NES to establish its own reputation. Finally, Nintendo's Seal of Quality implied tight market control, something that was desperately needed in the wake of the disastrous crash only three years earlier. This paratext, located directly on the packaging for Nintendo's Deluxe Set, spurred the first wave of sales and allowed Nintendo to pursue marketing the system's games directly the following year.

Conclusion

The revival of the home console market alone did not necessarily doom arcades to obscurity. However, the arcade's advantages seemed less important in the face of Nintendo's mighty machine. Nintendo boasted of arcade quality at home, appearing to deliver on that promise better than previous home consoles. Arcade games, by their nature, challenged players to last as long as possible on a single quarter, with games escalating in difficulty over a matter of minutes in order to draw another coin out after the inevitable game over. Nintendo's home games, on the other hand, invested extra memory into longer form games, such as *Super Mario Bros.*, *The Legend of Zelda* and *Metroid*. With full games lasting an hour or more, these experiences were impossible to replicate in an arcade, and could only be found at home. Battery backups of save data and passwords enabled players to resume their progress in longer games. Though Nintendo's quality restrictions were strict, the growing install base of NES systems across the country drew many developers to create games for the system, assured of a wide number of potential customers. Arcades lost their innovative edge to home games, a shift that proved permanent when subsequent console launches improved the technology available at home over and over.

While arcades remained in operation around the country, the focus had changed to the home. Arcades provided a particular game experience, one that was short, intense, and required a high level of skill to succeed. The supposed social nature of arcades, a mingling crowd of enthusiastic players, gave way to the more intimate audience of friends and family around the living room television. Moreover, the arcade, as a space outside the home uncontrolled by parental figures, fostered a reputation as a hang-out for slackers, deviants, deadbeats, and delinquents, all shirking the responsibility ascribed to children and teenagers of learning to be functioning adults by idling in the glow of the video screen. Communities passed zoning codes that discouraged the opening of new arcades and hamstrung the ones already in existence. Protests against graphic depictions of violence, made more serious by their interactive nature, drove people away from publically associating in arcades. Finally, the economic model of arcades could not sustain itself much longer. The constant operation of several machines at once required an average number of plays per day

across all games to maintain overhead, much less turn a profit. With each cabinet costing a thousand dollars or more by 1983 and most plays still costing a quarter, cabinets needed thousands of plays to break even. While a popular game could make up the shortfall of less played games, ultimately the novelty of these games wore off. As arcade owners struggled to make up the difference, video game companies shifted their focus to the dominant home market.

Though arcades gave way to home games, their decade of symbiotic existence generated codes of meaning through paratext that guide the industry today. Cabinet art and box art provided a cover to the text within, a brief glimpse at the theme present. In turn, themes carried weight from life experience, creating an expected reality within the framework of the game. Characters and narrative surrounding gameplay allowed the game's text to transcend the moment of gameplay, escaping into the world of merchandising, branding, and franchise building. Understanding the power of paratext in shaping meaning, companies like Nintendo and Atari worked to control that message to their benefit. Atari failed, and the rampant market nearly destroyed itself. Nintendo succeeded, rebuilding the ruined American trust in games through a bold campaign that placed the NES in the spot formerly occupied by arcades and Atari, proving that the message surrounding games was as important as the game itself.

Bibliography

- A, Steve. "ROB and NES "Best Stuff To Ever Have Been Packaged With A Game"." *Nerdko*. December 5, 2012. <http://www.nerdco.com/2012/12/05/the-best-stuff-to-ever-have-been-packaged-with-a-game/> (accessed December 11, 2015).
- Berger, Arthur Asa. *Video Games: A Popular Culture Phenomenon*. New Brunswick: Transaction Publishers, 2002.
- Bogost, Ian. *How to Do Things With Video Games*. Minneapolis: University of Minnesota Press, 2011.
- Burnham, Van. *Supercade: A Visual History of the Videogame Age 1971-1984*. Cambridge: The MIT Press, 2001.
- Camper, Brett. "Retro Reflexivity: La-Mulana, an 8-bit Period Piece." In *The Video Game Theory Reader 2*, by Bernard and Mark J.P. Wolf, ed Perron, 169-196. New York: Routledge, 2009.
- Consalvo, Mia. *Cheating: Gaining Advantage in Videogames*. Cambridge: The MIT Press, 2007.
- Donovan, Tristan. *Replay: The History of Video Games*. East Sussex: Yellow Ant, 2010.
- Garrelts, Nate, (ed). *Digital Gameplay: Essays on the Nexus of Game and Gamer*. Jefferson: McFarland & Company, 2005.
- Giordano, Ralph G. *Fun and Games in Twentieth Century America: A Historical Guide to Leisure*. Greenwood Press: Westport, 2003.
- Guins, Raiford. *Game After: A Cultural Study of Video Game Afterlife*. Cambridge: The MIT Press, 2014.
- Hand, Richard J. "Proliferating Horrors: Survival Horror and the Resident Evil Franchise." In *Horror Film: Creating and Marketing Fear*, by Steffan, ed. Hantke, 117-134. Jackson: University of Mississippi, 2004.
- Herz, J.C. *Joystick Nation: How Videogames Ate Our Quarters, Won Our Hearts, and Rewired our Minds*. Boston: Little, Brown and Company, 1997.
- Kent, Steven L. *The Ultimate History of Video Games*. New York: Three Rivers Press, 2001.
- King, Brad, and John Borland. *Dungeons and Dreamers: The Rise of Computer Game Culture from Geek to Chic*. New York: McGraw-Hill, 2003.
- King, Geoff, and Tanya Kryzywinska. *Tomb Raiders & Space Invaders: Video Game Forms & Contexts*. London: I.B. Tauris, 2006.
- Kohler, Chris. *Power-Up: How Japaneses Video Games Gave the World an Extra Life*. Indianapolis: Pearson Education, 2005.
- Loguidice, Bill, and Matt Barton. *Vintage Games: An Insider Look at the History of Grand Theft Auto, Super Mario, and the Most Influential Games of All Time*. Burlington: Focal Press, 2009.
- Massanari, Adrienne L. "Gendered Pleasures: The Wii, Embodiment and Technological Desire." In *Social Exclusion, Power and Video Game Play: New Research in Digital Media and Technology*, by

ed., edited by David G. Embrick, J. Talmadge Wright and Andras Lukacs, 117-140. Lanham: Lexington Books, 2012.

Murphy, Sheila C. "'This is Intelligent Television': Early Video games and Television in the Emergence of the Personal Computer." In *The Video Game Theory Reader 2*, by Bernard and Mark J.P. Wolf, ed Perron, 197-212. New York: Routledge, 2007.

Newman, James. *Videogames*. New York: Routledge, 2004.

Ruggil, Judd Ethan, and Ken S. McAllister. *Gaming Matters: Art, Science, Magic, and the Computer Game Medium*. Tuscaloosa: University of Alabama Press, 2011.

Scott. "Tapper from the Galloping Ghost Arcade, Brookfield, IL." *Flickr*. November 30, 2012. <http://www.flickr.com/photos/10707024@N04/15448500024/in/photostream/> (accessed December 11, 2015).

The Atari Club. "Atari Brings Ms. Pac-Man Home." *Atari Age*, January/February 1983: 7.

Wiese, Michael. *Film & Video Marketing*. Stoneham: Butterworth Publishing, 1989.

Wolf, Mark J. P. *The Medium of the Video Game*. Austin: University of Texas Press, 2001.

Wolf, Mark J.P., and , Bernard Perron. *The Video Game Theory Reader*. New York: Routledge, 2003.

Wolf, Mark J.P., editor. *Before the Crash: Early Video Game History*. Detroit: Wayne State University Press, 2012.

Wyatt, Juustin. *High Concept: Movies and Marketing in Hollywood*. Austin: University of Texas Press, 1994.

Yee, Nick. *The Proteus Paradox: how Online Games and Virtual Worlds Change Us - and How They Don't*. New Haven: Yale University Press, 2014.

Online Resources

The International Arcade Museum at Museum of the Game - <http://www.klov.net/>

The Authoritative Video Game Database - <http://www.mobygames.com/>

American Classic Arcade Museum - <http://www.classicarcademuseum.org/>

The University of Texas Videogame Archive -
<http://www.cah.utexas.edu/projects/videogamearchive/index.php>

The Strong National Museum of Play Online Collections -
<http://www.museumofplay.org/online-collections/>

Appendix

List of Games Mentioned in Text / Credits for Photos of Gameplay

Asteroids:

KLOV: http://www.klov.net/game_detail.php?game_id=6939

MobyGames: http://www.mobygames.com/game/arcade/asteroids_

Strong Museum: <http://www.museumofplay.org/online-collections/22/67/109.17155>

Baby Pac-Man

MobyGames: <http://www.mobygames.com/game/arcade/baby-pac-man>

Strong Museum: <http://www.museumofplay.org/online-collections/22/67/110.1585>

Battlezone

KLOV: http://www.arcade-museum.com/game_detail.php?game_id=7059

MobyGames: http://www.mobygames.com/game/arcade/battlezone_

Strong Museum: <http://www.museumofplay.org/online-collections/22/67/109.17153>

Crazy Climber

KLOV: http://www.arcade-museum.com/game_detail.php?game_id=7426

MobyGames: <http://www.mobygames.com/game/arcade/crazy-climber>

Death Race

KLOV: http://www.arcade-museum.com/game_detail.php?game_id=7541

MobyGames: http://www.mobygames.com/game/arcade/death-race____

Strong Museum: <http://www.museumofplay.org/online-collections/22/67/111.7002>

Dragon's Lair

KLOV: http://www.arcade-museum.com/game_detail.php?game_id=7647

MobyGames: <http://www.mobygames.com/game/arcade/dragons-lair>

Strong Museum: <http://www.museumofplay.org/online-collections/22/67/109.17306>

E.T. The ExtraTerrestrial

MobyGames: http://www.mobygames.com/game/atari-2600/et-the-extra-terrestrial_

Strong Museum: <http://www.museumofplay.org/online-collections/22/46/111.4437>

Galaga

KLOV: http://www.arcade-museum.com/game_detail.php?game_id=7881

MobyGames: <http://www.mobygames.com/game/arcade/galaga>

Strong Museum: <http://www.museumofplay.org/online-collections/22/67/109.17270>

Gyromite

MobyGames: <http://www.mobygames.com/game/nes/gyromite>

Strong Museum: <http://www.museumofplay.org/online-collections/22/46/114.7889>

Jr. Pac-Man

KLOV: http://www.arcade-museum.com/game_detail.php?game_id=8246

MobyGames: <http://www.mobygames.com/game/arcade/jr-pac-man>

Mario Bros.

KLOV: http://www.arcade-museum.com/game_detail.php?game_id=8624

MobyGames: <http://www.mobygames.com/game/arcade/mario-bros>

Strong Museum: <http://www.museumofplay.org/online-collections/22/67/112.4848>

Missile Command

KLOV: http://www.arcade-museum.com/game_detail.php?game_id=8715

MobyGames: http://www.mobygames.com/game/arcade/missile-command_

Strong Museum: <http://www.museumofplay.org/online-collections/22/67/109.17116>

Ms. Pac-Man

KLOV: http://www.arcade-museum.com/game_detail.php?game_id=8782

MobyGames: <http://www.mobygames.com/game/arcade/ms-pac-man>

Strong Museum: <http://www.museumofplay.org/online-collections/22/67/109.17273>

Ms. Pac-Man/Galaga - Class of 1981

KLOV: http://www.arcade-museum.com/game_detail.php?game_id=8784

MobyGames: <http://www.mobygames.com/game/arcade/20-year-reunion-ms-pac-mangalaga-class-of-1981>

Pac-Man (Arcade)

KLOV: http://www.arcade-museum.com/game_detail.php?game_id=10816

MobyGames: <http://www.mobygames.com/game/arcade/pac-man>

Strong Museum: <http://www.museumofplay.org/online-collections/22/67/109.17272>

Pac-Man (Atari VCS)

MobyGames: <http://www.mobygames.com/game/atari-2600/pac-man>

Strong Museum: <http://www.museumofplay.org/online-collections/22/46/108.3991>

Pong

KLOV: http://www.arcade-museum.com/game_detail.php?game_id=9074

MobyGames: http://www.mobygames.com/game/arcade/pong_____

Strong Museum: <http://www.museumofplay.org/online-collections/22/67/109.17106>

Professor Pac-Man

KLOV: http://www.arcade-museum.com/game_detail.php?game_id=9135

MobyGames: <http://www.mobygames.com/game/arcade/professor-pac-man>

Radar Scope

KLOV: http://www.arcade-museum.com/game_detail.php?game_id=9238

MobyGames: <http://www.mobygames.com/game/arcade/radar-scope>

Strong Museum: <http://www.museumofplay.org/online-collections/22/67/109.17163>

Space Invaders (arcade)

KLOV: http://www.arcade-museum.com/game_detail.php?game_id=9662

MobyGames: <http://www.mobygames.com/game/arcade/space-invaders->

Strong Museum: <http://www.museumofplay.org/online-collections/22/67/109.17111>

Space Invaders (Atari VCS)

MobyGames: <http://www.mobygames.com/game/atari-2600/space-invaders->

Strong Museum of Play: <http://www.museumofplay.org/online-collections/22/46/109.7068>

Stack-Up

MobyGames: <http://www.mobygames.com/game/nes/stack-up>

Strong Museum: <http://www.museumofplay.org/online-collections/22/46/110.1452>

Super Pac-Man

KLOV: http://www.arcade-museum.com/game_detail.php?game_id=9924

MobyGames: <http://www.mobygames.com/game/arcade/super-pac-man>

Tapper

KLOV: http://www.arcade-museum.com/game_detail.php?game_id=12839

MobyGames: <http://www.mobygames.com/game/arcade/tapper>

Strong Museum⁴⁹: <http://www.museumofplay.org/online-collections/22/67/109.17267>

Tempest

KLOV: http://www.arcade-museum.com/game_detail.php?game_id=10065

MobyGames: <http://www.mobygames.com/game/arcade/tempest>

Strong Museum: <http://www.museumofplay.org/online-collections/22/67/109.17151>

⁴⁹ The Strong Museum only has an entry for the Root Beer Tapper variant