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The Sims

By Todd Friedman

You can't talk about the history of simulation games without mentioning The Sims. The name itself is short for simulation. The Sims series is widely considered on the top of the list of franchise games. The Sims series has sold over 200 million copies worldwide and fans of The Sims franchise are online like never before. Hundreds of millions of player-created content have been shared and downloaded by one of the most active player communities in the world and the viral appeal of The Sims is further evidenced by its 30 million fans across global social networks. There are other amazing statistics about the franchise - as of September 2018, The Sims app has been downloaded 41 million times, sold over 25 million dollars to date with mobile gaming alone. That puts the total number of players that have played the game at approximately 80 million. The Sims franchise has generated more than 3 billion dollars in revenue, putting them in the same class as the blockbuster films Titanic and Avatar.

The Sims was designed and created by William Wright. Years before The Sims game was a reality, William designed the ever-popular game Sim City. This game would let you be your own architect by creating buildings, roads, parks, schools and fire stations, to name a few. The idea would be to build your own unique city or town while also pleasing the people living there. The first release of this game was in 1989 and was primarily for the Commodore 64. Numerous sequels followed in the following years as the popularity grew to historic numbers. The one variable you could not control was the people. They would be computer generated and their actions depended on the design of your world. William thought of the idea to create a new simulation game that would allow you to control all aspects of the individual inside the virtual playground. This

game would be called "The Sims". According to an interview he did with "Gamasutra", Wright explains that he did not have enough money or sponsorship to originally produce the game. "They never gave me any money for it, either, so I never got the advances. I wasn't in any real financial obligation. So, it just sat on the shelf for several years. The Commodore version was all done; it was just never published".

Finally, The Sims was published in early 2000 on the Microsoft Windows platform by Electronic Arts. The title was published by William Wright's company Maxis. Taking on one family at a time, you try to guide your characters to success in life, love, and the workplace. Along the way, you develop friendships, work your way up the career ladder, and try to keep your Sims fed and happy. You control their every move. Decisions they make is up to you, the gamer. Without successful decisions, you can see the characters diminish and notice they will have no future. There are so many decisions it can keep the average gamer hooked for hours on end. As the game goes on, there is personal interaction between the characters. Some decisions result in negative actions from the character, such as pushing away someone who wants to give a back rub, pulling someone out of the bathroom so they can pee, or becoming disappointed due to being shot down romantically. You see a variety of emotions on the characters as well, such as kindness, sadness, and even anger, which can turn into a fist fight. Each Sim has eight needs that constantly need to be met, and at most you can satisfy 2 or 3 needs at a time.

You control the whole neighborhood; however, you start one house at a time. If there is not an action in the house, nothing will happen. Most

of the time you can come back to the game and start where you left off, however, there are exceptions such as love. If your character is romantic when you leave the game, there is a chance they will either be serious or separated, depending on the nature of the situation. Energy is a big factor in playing a successful Sims game. There are two ways to increase Energy – sleep and coffee. Sleep is the better solution, and the better the bed (or couch in the case of naps, the more energy you receive in less time. If you fail to get to sleep or drink some coffee before your Sims' Energy bar hits Pure Red, then he will collapse on the floor and sleep there. Your Sim will wake up with no Comfort, and far less Energy than if he had slept in a bed. So, before the energy gets too low, send the Sim to bed.

Sims 2 takes place in Strangetown – a location featured on all versions of the game and share common characters between them. With great new environments, expanded character customization, and new ways to cook and prepare food are just some of the new abilities in The Sims 2. The Sims 2 provided many more challenges for ardent fans of this simulated life genre. Your Sims now come with dreams and goals that you must try to fulfill. The game also has a genetic component that lets Sims pass their own traits down to their kids. Children and teenagers now have homework and their grades rise or fall depending on whether they finish it or not. Teenagers can hold jobs as well as go to school, but if their grades drop too low, they can lose their job. Like

in the first Sims game, a mother Sim and a father Sim can have a child. Also, children can be made at the start of the game or received from an adoption service. You can even create custom Sims that look like you. Other improvements include "wants" and "fears". These change when a want or fear is completed or when the Sim wakes up from sleep. One of the biggest changes in Sims 2 is that a Sim can go to a community lot (a place in town like a store or a park). They can go there by using the phone to call a taxi. There would not be a video game these days without some kind of controversy. The Sims 2 delivered some to the public and there was a lengthy debate. When your character uses the washroom, there is a moment where the part of the naked body is blurred out. After a lengthy court battle, Electronic Arts removed the pixelated scenes from the game. Little did the world know what kind of adult content would be coming to the world after 2005.

On June 2nd, 2009, Sims 3 made its way to the shelves. The Sims 3 was a commercial success, selling 1.4 million copies in its first week. The Sims 3 introduced many more character customization options than The Sims 2. There are over 20 different hair styles to choose from on launch day. There were expansion packs created later that increase this number along with other perks. Sims 3 also has sliders that lets you choose customized gradients for skin color (to better represent different ethnicities). In this version of the game, it introduces "Story Progression" mode, which lets the Sims move around at will without controlling or making choices for them. Along with new traits for your Sims, The Sims 3 revamped the life-goal system, which was built around "lifetime wishes", a single long-term goal that you can choose for each of your Sims that will eventually grant that character ultimate happiness. There are also public events in The Sims 3, such as music concerts, movie premieres, pool parties, barbecues, sporting events, outdoor fishing, and actually attending a public protest at SimCity Hall. There are special skill abilities in this version - special

songs for guitar players, fishing, writing, gardening and painting to name a few.

In 2014, the last and most current Sims game was released - The Sims 4. All new locations came with this version such as piano bars, libraries, nightclubs, and a dense, activity-loaded park that is the game's public hub. One of the new features of this release is Multitasking. Examples include such activities as greeting visitors without putting down their cereal bowls and chatting with the neighbor while gardening. Characters engage and disengage from conversation far more fluidly, as well, and can do so from multiple seated character arrangements. You can build your own cafes and museums as well as homes, and that encourages the degree of obsessive personal attachment that many fans look for in The Sims. For the first time, The Sims felt and expressed emotions. Your Sims can experience a diverse range and depth of emotional states and are influenced by interacting with other Sims, actions, events, memories, and even by the clothing and objects you choose for them. Emotions offer you more choice by giving you the opportunity to create richer stories with even more possibilities. Expansion packs are a big part of The Sims success and keep gamers coming back for more, however, it does come with a price. For instance, if you wanted all the packs available for The Sims 4 which includes 5 expansion packs, 6 game packs, and 14 stuff packs, would total approximately $500 based on full asking price.

The Sims games have been translated into 22 different languages (including Russian and Thai) and shipped to 60 countries across the world. Will Wright once introduced a mysterious virus to the game,

and as the infection spread throughout the game's world, so did debate on the message boards. Players finally traced it back to pet guinea pigs and shared tips for surviving the outbreak. There were many spinoff Sims games that were not a part of the four regular versions. A few examples of these spinoffs included The Urbz: Sims in the City, a console only game taking place in a hip city setting; The Sims Stories, a spinoff series using goal-directed story mode and The Sims Medieval, the first title in the series to take place in Medieval Times. Will there be a Sims 5? Most are hoping so, but the design of Sims 5 is still not confirmed, so nothing official has be said regarding a potential release date. Many would love to see The Sims join the Nintendo Switch Console. At this time, there is no plan on releasing The Sims on the Switch, but with the huge Nintendo fan base, you never know.

February 2019 will mark the 19th Anniversary of The Sims game. To honor this occasion, you can pick up a cool Sims T-shirt from the website, www.thesims.threadless. com. The Sims 19th Anniversary Pack shirt sells for 20 dollars in black or white. If those aren't to your liking, there's a ton of other cool Sims items on the official website. I have not personally spent a lot of time recently on The Sims Franchise, but growing up it was a cool third person virtual reality that I did take part in and enjoyed. I have no doubt that in today's VR technology that sometime soon we will see an actual Virtual Reality Sims game that puts the gamer into the Sims world and lets them live an alternate reality. I, for one, am very curious about the future of The Sims and what it will bring to the next generation.

Todd Friedman is heavily involved in the video game community. He is currently writing for Old School Gamer Magazine, Little Player Magazine, Retro Player Magazine, RetroGaming Times and The Walter Day Collection. He has Co-Promoted the Video Game Summit in Illinois for the past 10 Years. Todd is an avid video game collector with over 3500 console games and 35 systems, One of his main responsibilities is keeping the Walter Day Trading cards alive. Todd holds over 60 world records on the Nintendo Wii game DJ Hero. Todd was also a nominee for the International Video Game Hall of Fame, class of 2016 and 2017.

Turn and Burn

KITCHEN'S LIFE-LONG F-14 LOVE AFFAIR

By Patrick Hickey Jr.

For many game developers, there's always that one golden goose or white whale. That game or genre that appeals to them the most. The thing that will cement their legacy. The one that regardless of their success on other projects, they always come back to. For Dan Kitchen, despite the fact that he'd worked on dozens of other successful projects, from ports and games based on hugely-successful licensed products to original works, on a bevy of home consoles, he still had his own dragon to catch. A 16-foot tall, 61 feet, nine inches long, 72,000 pound metallic one, as a matter of fact. The F-14 Tomcat. From his work on the Atari 2600 to the Game Boy and the Super NES, culminating with the Game Boy Advance, Kitchen has always found a way to do games based on the former crown of the United States military aviation program.

If you've ever seen the seen the film Top Gun, it's easy to see why. The aircraft is a marvel of modern technology, evidenced by over 30 years of active duty. Add in the romanticized tones of the film and it's almost like the plane had a soul. It represented American strength, sex appeal, charisma and honor. For many, it's the reason why they grew up to love aviation. For others, it made them want to climb into the cockpit for themselves. Kitchen, on the other hand, had a different goal. To create an experience in the video game realm where the average Joe could experience what it was like to engage the enemy and dogfight for aerial supremacy. At the same time, not so ironically, his career in video game development could be channeled through a reoccurring theme in Top Gun. "A good pilot is compelled to evaluate what's happened, so he can apply what he's learned," Cmdr. Mike "Viper" Metcalf, played by Tom Skerritt, tells the film's main character, Pete "Maverick" Mitchell, played by Tom Cruise, at one point in the film. "Up there, we gotta push it. That's our job. It's your option, Lieutenant. All yours." Make no mistake, it was Kitchen's goal to push the quality of console aviation games, primarily those focused on the F-14 and dogfighting, to the next level.

There was a huge problem though. Video game technology wasn't quite up to the task of capturing what it was like to feel Maverick and Goose's need, need for speed. But if there was one developer who could get a lock on emulating that experience digitally, it was Kitchen. A

master of squeezing every last byte on every game he worked on previously, Kitchen got games to perform better in spite of many of the limitations that faced most cartridge-based developers of the era. A testament to his dedication and appreciation of the aircraft, Kitchen went go on to develop an Atari 2600 game in 1988, Dan Kitchen's Tomcat: The F-14 Fighter Simulator and later the Nintendo Game Boy's Turn and Burn: The F-14 Dogfight Simulator in 1992, two years before Turn & Burn: No-Fly Zone was released on the Super NES in 1994. In-between his own original work on aviation games, he'd also work on a sequel to the immensely popular arcade-styled aviation game, River Raid in 1988 and on an aviation game loosely-based on The Flight of the Intruder book series in 1991.

And while his vision wouldn't be perfected until he took the experience to the Game Boy Advance in 2001, 13 years after his first flight-sim, Kitchen hit the sweet spot first on the Super NES. While like most Absolute Entertainment Titles, it wasn't a massive door-busting best-seller, it was a game that connected you to its source material and sold well for the publisher to continue to operate and thrive. Like many Absolute titles, it was polished. With sights and sounds rarely seen from a third-party developer on the Super NES, Turn & Burn: No-Fly Zone was ahead of its time and not ironically, is still playable today. That has a lot to do with Kitchen's love for aviation.

"Turn & Burn came from my love of naval military aircraft, specifically the F-14. I've always loved flying and have been fascinated by all types of aircraft. I tried to recreate that love of flying in a number of previous games. The SNES was the first system that allowed me to create the experience of real dogfighting. I had created a number of versions of the game starting with Tomcat: The F-14 Fighter Simulator on the Atari 2600," Kitchen said. "I was very happy when we decided to put the game on the SNES where I could finally create a more realistic combat experience for the player."

Utilizing many of the lessons learned from the previous games, Kitchen went into the Super NES development process hungrier to make the experience more real than he had in previous games. One of the tricks he ended up implementing was allowing the player to leave the first-person view used in No-Fly Zone and in his previous games, to look around the skies for enemies that may not be in their normal view. This view was of the full-motion-video type as well, adding a level of visual appeal not seen in any aerial combat games up until the point. It ended being one of the coolest parts of the game, a bell and whistle that wasn't at his disposal on the Game Boy or Atari 2600.

"I wanted the game to recreate as much as possible the experience of dog fighting in an F-14," Kitchen said. "During actual

combat, F-14 Drivers (a term used by the pilots) and RIOs (Radar Interface Officers) have to be able to view as much of the sky around their aircraft as they can when bogeys are close. Adding the Back-Left and Back-Right views attained this and made it possible for the player to view bogeys that were behind them (at their six o'clock position)."

That re-creation of reality was possible due to a litany of factors, not just adding features. It was about understanding the people who actually fly the jets. In a move that cemented the realism and polish behind Turn & Burn: No Fly Zone, Kitchen actually became a bit of a journalist. "During the development of Turn & Burn I had the opportunity to speak with two F-14 drivers and hear firsthand their experiences of sitting on the deck waiting for the cat to launch and the stress they felt during nighttime TGLs (touch and go landings)," Kitchen said. "One told me that early in his deployment he had his 'night in the barrel' where it took him three attempts to land on a rolling deck in the rain. I admire these aviators who live on the edge every day and exist for the thrill of going from 170mph at full throttle over the hardtop to 0 in less than a second."

Being able to have missions during, day, night and twilight also added a nice bit of gameplay differential. It took what could have been a bland simulator and provided the necessary spice to complete the package. It was time-consuming, but Kitchen believes the effort was well worth it.

"It took a lot of tweaking to get the colors just right so that the player could experience the change of day but still be able to easily identify the bogeys against the sky colors," Kitchen said.

With realism being one of his paramount objectives, Kitchen didn't go the After Burner route, a wonderful aerial combat game with arcade gameplay, where the player could fire missiles seemingly at will. Kitchen did his research. He understood the aircraft. He connected with it. "My research on the actual F-14 and work on previous aircraft fighter games helped me to make the sense of flying and combat as realistic as possible on the SNES. I wanted to replicate the armaments that an actual F-14 carried," Kitchen said. "For example, the AIM-54 Phoenix Missile is an actual radar-guided 'fire and forget' ordinance that the F-14 carried, usually in clusters of six."

That didn't mean that Kitchen didn't make sure he enjoyed the development process. He also made sure he understood the small things he'd have to do in order to make the game appeal to those who weren't as enthralled by the F-14 as he was. "Well, I'm not saying any footage from outside sources was used, but the full-motion-video of the enemy bogey being destroyed by a missile that appears in the cockpit display looks like it was inspired by a video sequence that appears in Maverick's F-14 near the end of the film Top Gun," Kitchen said.

Once development began to kick in high gear, all the attention to detail, realism and fun began to reap their rewards. "The first day we got the dog fighting implemented, I was so excited that I stayed up almost another 24 hours straight tweaking it so that the other designers would be able to play it and give me feedback," Kitchen said. "I also spent a lot of time reading about the aircraft's onboard systems and sitting with the artist going over whatever images of the actual F-14 cockpit I could find in books (remember it was before the Internet) to make sure we recreated it as closely as possible on the SNES display."

While many gaming publications, GamePro, in particular, appreciated the "eye-popping Mode 7 graphics," which made it,

according to them, "one of the most realistic, and most involving, flight sims of the year," Kitchen sees the game's combat the part of the game he's most proud of. "The aerial combat against the enemy bogeys," Kitchen said. "And the enemy AI was tweaked for quite a while to get the experience to feel like you were actually dog fighting."

While Electronic Gaming Monthly called the game "a complete love/hate affair," stating that it wasn't for everyone, they still acknowledged that the game was "very intense and plays well." In their January 1994 issue, Game Players made sure to let players know that Turn & Burn: No Fly Zone was a "'real' combat game, not a blast-em-up." Garnering that type of critical reception, it appeared Kitchen's work was done. "After release, the game was well-received as I was hoping it would be," Kitchen said.

However, Kitchen wasn't finished. Seven years later and his fascination with the F-14 continued. This time on the Game Boy Advance in the form of F-14 Tomcat. Similar to the Super Nintendo in terms of hardware capability, the GBA was the perfect device for Kitchen to put the finishing touches on his most important project. "My biggest regret about the Super NES version is that we didn't have time in the development cycle to add a few 'Easter Eggs' that I planned to hide in the game," Kitchen said. "Later in my career, I had a chance to recreate Turn & Burn: No-Fly Zone on the Nintendo Game Boy Advance and was able to add some unique hidden bogeys including one that was literally 'Out of this World!' I would like to have [also] made the Carrier Landing Sequence more realistic on the Super NES. I was never quite happy how the sequence ends when the aircraft finally grabs the third arrestor hook and hits the deck."

A perfectionist at heart, Kitchen's Turn & Burn franchise, regardless of the system it appeared on, or the name on the cart, is a testament to seeing a project through to the end, whenever or wherever that may be. "I'd like players to feel at 1G sitting in front of their SNES what it's like to launch off a carrier and go from 0 - 150mph in 2 seconds pulling 3.2G," Kitchen said. I would hope that players supporting the SNES still enjoy playing the game. It was exciting to be part of Absolute at that time. Our sales were good and the Nintendo market was going strong. I had the opportunity to work on some very prestigious games with some very cool people."

Patrick Hickey, Jr. is the founder and editor-in-chief of ReviewFix. com and a lecturer of English and journalism at Kingsborough Community College, in Brooklyn, New York. Over the past decade, his video game coverage has been featured in national ad campaigns by top publishers the likes of Nintendo, Deep Silver, Disney and EA Sports. His recently published book, "The Minds Behind the Games: Interviews With Cult and Classic Game Developers," from McFarland and Company, has already earned praise from Forbes, Huffington Post, The New York Daily News and MSG Networks. He is also a former editor at NBC and National Video Games Writer at the late-Examiner. com. He is currently working on a followup, that already includes the developers of such iconic games as NFL Blitz, Conker's Bad Fur Day, Tony Hawk Pro Skater 3 and West of Loathing.

Fox's Game

LUCASFILM, MIRAGE, AND THE GREATEST VIDEO GAME YOU'VE NEVER PLAYED

By Shaun Jex

Later this year, Disney will open Star Wars: Galaxy's Edge, a theme park experience set in the world of Star Wars. Amongst the coming attractions is Millennium Falcon: Smugglers Run, which puts visitors in the Millennium Falcon. Guests will have specific jobs which affect how the story in the attraction plays out. The ILM Experience Lab, a division of Lucasfilm Ltd., which focuses on virtual reality, augmented reality, and real-time cinema, is creating the ride "film" in conjunction with Nvidia and Epic Games. It's a giant step in immersive entertainment, but for longtime fans of Lucas Film Ltd., it harkens back to the early 1990s and a project known as Mirage.

David Fox, who was responsible for classic video games like Rescue on Fractalus! and Zak McKracken and the Alien Mindbenders, served as the Manager for Entertainment Software for Mirage, Lucas Film Ltd.'s first foray into location based entertainment (LBE).

Though the project began in the 1990s, it had its roots in the 70s when Fox was counseling people on their lives and relationships. The work helped him develop ideas for a new kind of entertainment. "I began imagining an Interactive Disneyland where all the attractions would be just as immersive as the theme parks of the time, but instead of static repetitive attractions, they'd be ever changing," Fox said. "People going through these would end up learning more about themselves, being put through experiences that were empowering and enlightening."

Orson Scott Card's sci-fi classic Ender's Game fed into his vision and furthered his concept of a simulator that could be used for entertainment and enlightenment. "He very much described the personal growth part of my vision with the Giant's Game that Ender would play," Fox said. "It would devise puzzles it knew Ender would have trouble with because of his limited way of seeing things. To solve those puzzles, Ender would

have to break out of his normal patterns and think differently. As a result, the solving the puzzle would also open Ender up to new ways of thinking."

Fox joined Lucasfilm in 1982, but it wasn't until 1990 that the company decided they were ready to begin exploring LBE. Fox and a small group formed Rebel Arts and Technology and Mirage was born a short time later.

The game placed players inside the cockpit of a craft with two seats: one for a pilot and one for a gunner. As Fox describes it, players sat in a pod with a 120° field of view display. Three roof-mounted video projectors bounced an image off of a collimating mirror to give the impression that players were looking at a distant landscape. An Evans & Sutherland ESIG 2000 image generator drove the video display and an Amiga computer provided the heads down display. Mirage also utilized a surround sound system using a rack of MIDI equipment and sampled sounds. The game would link eight of the pods together, with an ultimate goal of selling the experience to theme parks. "The prototype game we created was inspired by Star Wars, with 4 X-wings and 4 TIE fighters battling each other," Fox said.

Hughes Aircraft Company handled the engineering and software creation, with Fox and his team designing the pod and game. To keep costs down, the simulator did not have a motion platform. Instead, the team believed the large display and a focus on sound, would create a realistic experience. "I spent hours going through the Skywalker Sound's library of Star Wars audio samples," Fox said. "When played through the 5-channel surround sound system, along with a CD of select Star Wars music, you really felt you were inside the film."

When it was finished, according to Fox, it was "maybe the best game I've ever played." Sadly, Lucasfilm

abandoned the project in 1992 and Fox left the company. Mirage was displayed at the 1992 IAAPA (International Association of Amusement Parks and Attractions) convention, and Hughes continued trying to sell the project, but no one was buying. "I think part of the problem was the technology was just too expensive then, especially the image generator," Fox said.

Today, immersive entertainment is on the rise. In addition to attractions like Millennium Falcon: Smuggler's Run, there are experiences like "The Void", a mixed reality form of entertainment that has allowed people to step into the world of Ghostbusters, Star Wars, and Ralph Breaks the Internet. "They're a lot of fun," Fox said. "They have a lot more improvement before they totally nail the effect, but that's inevitable. Of course, the main difference between my original vision and the current crop of LBVR experiences is they are purely games. I don't know of any that aspire to do anything more than entertain, no hidden agendas to enlighten the players."

It has taken decades for the technology and philosophy of entertainment to catch up to the vision Fox began dreaming of over 40 years ago, but he's still excited to see what happens next. "I look forward to it!" Fox said. "And maybe even being a part of a team that helps make it happen."

Shaun Jex is a lifelong gamer, a journalist, and pop culture historian. His love of video games began with a Commodore 64 he played growing up, late night sessions on his NES, Game Boy and Sega Genesis, and frequent trips to the local Tilt arcade. He edits the Citizens' Advocate newspaper in Coppell, Texas and writes about Disney and Walt Disney World history for Celebrations Magazine and the Celebrations Magazine blog. He runs a channel with his wife Kara called "The Marceline Depot," dedicated to Disney, amusement parks, and travel.

Driver and Driver 2

By Conor McBrien

While most classic driving games would make players participate in races, stunts, or demolition derbies, Driver has players do things like helping crooks flee the scene of a bank robbery or delivering a stolen car to a chop shop.

In Driver and Driver 2, you play as John Tanner; a former race-car driver turned undercover cop who has pitched himself to the thugs of the underworld as a reliable deliveryman and an unfailing getaway driver. Under orders from a lieutenant trying to break up a crime syndicate, Tanner heads to Miami and begins the case without his badge or any back-up.

The first game in the series was released for the original PlayStation in 1999 and followed by its first sequel in 2000. They were developed by British studio Reflections Interactive, now known as Ubisoft Reflections. In the late 80s and early 90s, Reflections made titles like Ballistix and the Shadow of the Beast trilogy for Atari ST and Amiga home computers.

By the time Reflections started working on Driver, they had already created vehicle-based games like Destruction Derby, Destruction Derby 2, and Thunder Truck Rally, all for the PlayStation. They had also been acquired by another company called GT Interactive, hence the change in name to Reflections Interactive.

Destruction Derby's 1995 release kicked off a sixteen-year period where Reflections worked primarily (if not strictly) on vehicle-based games. It was clear that the programming team had a knack for driving games.

When you begin the first Driver, the game starts off with a tricky tutorial that you must overcome before you can actually start playing the story missions.

In a strict time-limit, you have to perform a variety of driving maneuvers including a reverse 180 degree turn and a "slalom," which is a term I definitely had to look up when I first played the game as a kid. To make the tutorial even trickier, if your car collides with anything four

times it is considered "wrecked" and you have to start all over.

Despite its difficulty, I think the tutorial was meant to show off that the controls in Driver allowed for a variety of realistic motions. There are plenty of optional, advanced driving challenges to undertake, but the game's story missions do not really necessitate any fancy driving because of the level design.

The cities that the player navigates are flat, rectangular grids like many cities in real life, but every turn is a ninety-degree angle. Places like San Francisco have hills that could be ramped off of at high speeds but there's little use for stunts.

One thing that indicates how basic the map designs were in the first game is the back of Driver 2's case, which exclaims: "All-new curved road systems bring the action to life with ultra-realism."

Yes, the game was trying to hype up the fact that the roads were curved.

Driver 2 does not feature a mandatory tutorial like its predecessor, but the first several missions in the game are a significant step-up in difficulty. One early level has Tanner chasing an elevated train from street level—a likely homage to the classic chase scene in the 1971 film The French Connection. Another mission is an intimidating escape sequence from a warehouse district controlled by a local gang. Large utility vans either chase Tanner's car or block his path the whole way.

Missions in both games are timed. The player starts at a certain point on the map and often has to make it to another point on the map in a short period. To make missions easier, you can familiarize yourself with a map's layout by either looking at the map itself or by driving around in "Take a Ride" mode, which features no missions at all and allows the player to roam freely.

Regardless of gameplay mode, you

start playing with two empty meters—"Damage" and "Felony." The former is self-explanatory; if your vehicle hits other cars or nearby structures, the Damage meter will increase until it is full and the car is wrecked. The "Felony" meter increases for various reasons and sometimes fills automatically in certain missions. If you run into other cars (especially police cars) or damage other property, the meter increases and police will begin to pursue you.

If the police pursue you and you lose them, all police cars on the map will be on the lookout for you. In that case, you will find yourself sneaking down every street, keeping one eye on the map the whole way.
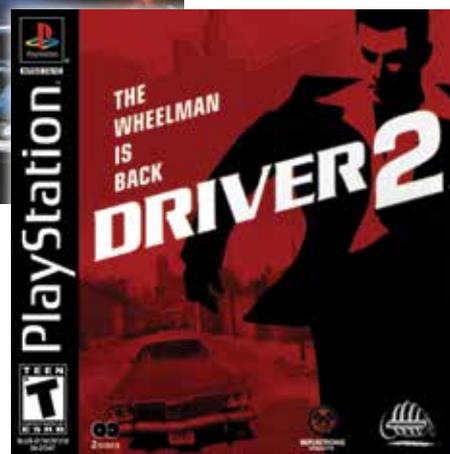
Alerting the police can make missions that don't already involve them pursuing you much more difficult. So it pays to be a little slow and stealthy in order to avoid encounters with law enforcement. This approach is flawed, of course, because of the strict time limit in most missions,

Conor McBrien was hooked on gaming as soon as someone handed him a Game Boy and a copy of Tetris in the mid-90s. His first console game was Donkey Kong Country for SNES, which made him a devout Donkey Kong fan. He has taken his hobby with him everywhere he's gone, from his home state of Illinois to Florida, from the University of Iowa to Upstate New York. While in college, Conor wrote game reviews for The Daily Iowan. Much more recently, he started writing Game Grappler--a blog where he wrestles with assorted gaming topics, including the preservation of video games, odd characters, and game analysis.
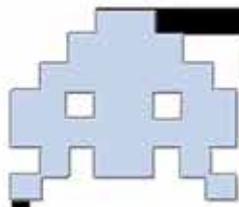
RANGE   6

MAGNIFICATION   3

Behind Enemy Lines

HOW ATARI'S VECTOR HIT WAS RECRUITED BY THE U.S. ARMY

By Michael Thomasson

Near the end of 1980, Atari released the first-person combat simulator Battlezone in arcades. With its twin stick controls, overhead radar, and innovative plastic periscope, it mimicked an early construct of today's virtual reality set-ups. Since the viewfinder directed the player's line of sight, essentially shutting out the outside world, it gave players the sensation of being in an actual tank as they traversed a barren landscape in three dimensions, hunting enemy tanks and UFOs.

Major Jack Thorpe of the Pentagon's Advanced Research Project Agency (ARPA) stated, "It's important to have training devices that don't appear so obviously to be training devices." Perhaps that is why Army General Donn A. Starry, with a consultant group of retired generals, requested a "training potential" study to determine if video game technology could meet Army training requirements.

Captain Steven J. Cox of the Army Training Support Center (ATSC) reported that there were numerous games with the "potential for military training use" and followed up by stating, "the continuing rise in the cost of fuel, ammunition, and training, plus the constant need for the Army's combat divisions to maintain a high degree of proficiency while saving money, has made us look at any possible training device."

At the time, logistics limited real-world firing exercises to only once or twice a year. Major Boyd Duncan described the root of the problem, stating that "between these exercise periods gunners lose so much of their skill that a practice period is usually needed before the normal firing exercises are conducted." Hence the need for a practical solution.

Could Atari's Battlezone have been such a solution? Atari was commissioned to modify the game for the United States Army to train Bradley armored personnel carrier gunners. This ruffled more than a few feathers within the company, including Atari employee Ed Rotberg, the original programmer of Battlezone. Only after being promised by Atari management that he would never be asked to work on any future military work did Rotberg comply and spend three additional months developing The Bradley Trainer.

The changes Rotberg made were extensive. The radar system was replaced with an improved magnification, allowing for calculated azimuth angular trajectories. Furthermore, he limited the steering to make it primarily a targeting simulator rather than a tank mobility trainer. Obviously, the alien UFOs were no longer necessary targets in the simulator and were removed. In their place, silhouetted tanks and helicopters of the Warsaw Pact countries were added - all of which followed routes that would normally be taken by an authentic target. In addition to simply firing rounds, missiles and machine gun artillery were also integrated. If a G.I. accidently targeted and scored a hit on an allied war machine, Tchaikovsky's 1812 Overture would regrettably play. These enhancements required the addition of a math accelerator circuit in the game's custom programmable read-only memory (PROM).

Other hardware changed, too. The twin joysticks were replaced with a two-handled gunner yoke. As a result, the sights and controls looked, felt, and responded like the real weapon. If the twin-sticks seem oddly familiar to you, that is because Atari later re-used them in their popular Star Wars arcade game.

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 ⬡ ⬡ ⬡
SCORE       400000

HIGH SCORE      5000
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MICHAEL THOMASSON'S JUST 4 QIX

Atari delivered the modified Battlezone game to the U.S. Army Training and Doctrine Command (TRADOC) in Fort Eustis outside of Williamsburg, Virginia. The simulators' cost to tax-payers is unknown, but considering that the soldiers training on the trainer had much more to lose than a simple quarter in the battlefield, perhaps it was a good investment by the defense department.

The Bradley Trainer was demonstrated at the 1981 TRADOC Commanders' Conference and a study was designed to evaluate its effectiveness. Three test groups were set-up, all of which were pre-screened on their selective gunnery skills. Group A received conventional gunnery training and was prevented from playing the trainer or any video games; group B was partially trained with the trainer; and group C was prepared using the Bradley Trainer exclusively. Following the experiment, all three control groups were analyzed once more using true Army weapons under simulated and live-fire environments.

Thirteen-plus thousand Battlezone coin-ops rolled into the arcade battle-field. The Army's testing results were never released – perhaps even classi-fied. One would assume that the conclu-sion deemed the endeavor unsuited to the task, as in the end, only two Bradley Trainer units were known to exist. One was delivered to the US Army and eventu-ally lost to time – presumedly destroyed; while the other was rescued from the Midway Games rear parking lot dumpster, and is now in the possession of a collector named Scott Evans.

Bradley Fighting Vehicle Gunner Yoke

SIMULATOR SEQUEL

Atari's Red Baron, another first-person simulator, shared the same monochrome vector graphics as Battlezone. Named after the German flying ace Manfred von Richthofen, the player fought for the Allies piloting a World War I biplane. Red Baron also shared the same additional "auxiliary" circuit board that was required for computing the math that simulated the 3D environment in both games

EMULATION INACCURACIES

We may never be able to sample the true Bradley Training device even using emulation. While the popular M.A.M.E. software will let you run a modified version of Bradley Trainer using Battlezone's emulation, it is only a facsimile of the full experience. The Bradley Trainer used a mathbox accelerator circuit, the same auxiliary board used in Red Baron. This custom PROM differs from the stock Battlezone, alters the artificial intelligence, collision detection, and more... and sadly has never been dumped.

Michael Thomasson is one of the most widely respected videogame historians in the field today. He teaches multiple college level videogame courses, and has contributed to dozens of gaming texts and television shows including MTV's Video MODS and the highly-rated book Downright Bizarre Games. He has written business plans, managed a multiple game-related retail stores, and consults for multiple video game and computer museums. Michael has helped publish 100s of games on Atari, Sega and other console platforms. In 2014, The Guinness Book of World Records declared that Thomasson had "The Largest Videogame Collection" in the world. Visit www.GoodDealGames.com.

Asteroids and Beamrider

By Brett Weiss
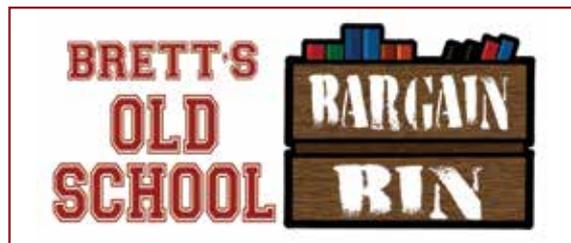
The theme for this installment of Old School Gamer is simulation games, but I'm still on a shooter high from the last issue, so I'm going to spotlight two more shooting games that are easy on the wallet, yet fun to play.

If you're cool with cartridge only, Asteroids Hyper 64 will set you back just $10 or so, which is cheap for a good Nintendo 64 game. Beamrider for the ColecoVision is more expensive at around $15 to $20, but it's well worth it for such a quality title.

ASTEROIDS HYPER 64

NINTENDO 64

PUBLISHER:CRAVE ENTERTAINMENT

DEVEOPER: SYROX

1999

Back in the mid-1970s, before video games took over the arcades, pinball was my favorite way to waste quarters. As a young kid, I enjoyed Pong (1972) and had a good time with Midway's Gun Fight (1975), but pinball was where I spent most of my time. This all changed with the release of Breakout (1976), Space Invaders (1978) and Asteroids (1979), the vector graphics classic.

I was so obsessed with Asteroids, in fact, that I mastered it to the point where I could play for hours and hours on one quarter. I distinctly remember being kicked out of a Quickway convenience store near my junior high school at 10 p.m., when the store closed. I still had a long row of ships at the top of the screen.

Twenty years after I played my first round of Asteroids, Crave Entertainment released Asteroids Hyper 64 for the Nintendo 64, complete with such updated raster graphics as colorful planets, space debris, starry backgrounds, and elaborately detailed alien ships. Surprisingly, there is no music, and the sound effects could use some "oomph," but the game is a lot of fun.

Unlike Paperboy 64, a truly wretched creation, this is a retro-remake I had a good time with because it retained the flavor of the original game while adding nifty challenges and features, including popcorn asteroids, which are challenging and unusual because they get bigger and faster as you shoot them (up to a certain point), and radioactive asteroids, which are somewhat like Kryptonite—when you get too close to them, they zap your ship's powers in different ways, depending on what color they are. You'll enjoy blasting your way through the various asteroid types and figuring out what strategies work best for each.

Another aspect of this game that keeps the Asteroids concept fresh—even for those tired of the original—is the notion of zones, each with a different playfield that affects the action. For example, each level of Zone 2 has a black hole that forces you not to loiter in the center of the screen, and Zone 4 has an alien queen that cannot be killed, no matter how many times you shoot it.

Further, up to four players can compete in two multi-player modes: The Knockout Game, a battle to see who can get as many points as possible in order to stay in the lead, and the Color Clear Game, where players blast only those asteroids that match the color of their own ship. Only after destroying all of your own asteroids should you fire on other colors. Both multi-player games end when one ship remains.

The best thing about Asteroids Hyper 64 is that it keeps the basic control system of Asteroids intact. You can still spin, thrust, shoot, and warp into hyperspace smoothly and efficiently with the entire screen as your battlefield. In addition, the programmers included a number of cool special weapons, lots of enemy ships, and a shield feature similar to that found in Asteroids Deluxe.

As you might expect, there is a replica of the original Asteroids game hidden in Asteroids Hyper 64. To unlock it, go to the Main Menu, hold the L button, and then press left C, right C, top C, bottom C, A, top C, bottom C, left C, right C, start.

Brett Weiss - Noted video game historian Brett Weiss is the author of 10 books, including the Classic Home Video Games series, The 100 Greatest Console Video Games: 1977-1987, Retro Pop Culture A to Z, and The SNES Omnibus Volumes 1 and 2. He's had articles published in numerous newspapers and magazines, including the Fort Worth Star-Telegram, AntiqueWeek, Game Informer, Classic Gamer Magazine, Video Game Trader, Video Game Collector, Filmfax, and Fangoria.

BEAMRIDER
COLECOVISION
PUBLISHER: ACTIVISION
DEVELOPER: ACTION GRAPHICS
1984

In Beamrider, you control a Light Ship that moves back and forth at the bottom of a grid. This grid is called a Restrictor Shield, and it is designed to protect Earth from alien invasion.

Your job is to clear the grid of Enemy Saucers, Bounce crafts, Blue Chargers, Green Blockers, Chirpers, Magnetic Mines, Red Zig Bombs, and Orange Trackers. These alien vessels ride the beams up and down and back and forth, wreaking havoc on the screen. Armed with an unlimited amount of Laser Lariats and a handful of torpedoes, you must shoot everything in sight.

After you have destroyed fifteen Enemy Saucers, a Sentinel Ship will cruise across the top of the screen. After you complete each sector, you will return via hyperspace to a space station where you will prepare to leave for your next mission. There are 99 sectors in all; a new enemy is introduced every other sector up until number 16. In addition to the enemies, a Yellow Rejuvenator will occasionally appear onscreen. Allow one of them to land on your deck and you will receive a free ship.

Unlike such games as Space Invaders and Galaxian, the ship in Beamrider cannot move in small increments; it must always stop on one of the five vertical beams on the grid. Since you can't move in small increments, you must develop new strategies not found in similar games. While this element creates new challenges, it doesn't necessarily make it more fun than other games in the genre, just different. In the video game industry where every decent game concept is copied again and again, different is certainly a good thing.

Like many games bearing the Activision name, Beamrider is a marvel in terms of design. The controls are smooth, enemy ships move in relatively unpredictable patterns, the difficulty level increases at a nice pace, and the objectives for playing the game are easily defined, yet challenging to master. With the restriction of being able to stop your ship on only five beams, the game could've easily been frustratingly difficult, constantly placing you in all but impossible situations, but that is not the case.

The graphics are simplistic for a system with the capabilities of the ColecoVision, but the ships look cool and are unhampered by blinking. There's no music, but the sound effects, which evoke a futuristic world, make up for this absence to a large degree. Beamrider was also developed for the Atari 2600, Atari 5200, Intellivision, and various home computers.

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Flip Grip: Bullet Heaven

By Rob Faraldi

Shmups (short for "shoot 'em ups") were a mainstream genre decades ago, but have since become a persistent niche. Some of the more popular and notable shmups include Radiant Silvergun, Ikaruga, M.U.S.H.A., and Raiden. Certain classic consoles including TurboGrafx-16, Sega Genesis and Sega Saturn are popular for being "shmup machines," as there are a high concentration of excellent original titles and arcade ports for these systems. Shmups usually consist of vertically ("Tate" in Japanese) and horizontally ("Yoko" in Japanese) scrolling titles, though there are exceptions. While horizontally scrolling shmup arcade ports translate well to the home, many vertically scrolling arcade ports only take up a small part of the screen if viewed in the proper aspect ratio, akin to watching video taken in portrait mode on a smartphone on your TV. While some vertical shmups do allow for a proper full screen mode, it requires the user to rotate a television vertically to play. Some shmup fans have gone to great lengths to play in Tate mode, but it has been a hassle until now.

Enter the Flip Grip, a $12 piece of plastic that turns a Nintendo Switch into a Tate shmup fan's dream machine. Setup is easy: insert the Switch screen vertically into the Flip Grip's dock and slide the Joy-Cons into the Flip Grip's rails and start playing. It's that simple. Certain buttons and ports are obscured while using the Flip Grip such as those used to control volume, but there is a way to manipulate sound while playing. Once assembled, you'll notice how solid the Switch feels and looks with the Flip Grip attached. It's very handsome and sturdy, and feels as if it were a first-party product brought to market by Nintendo. If I were to offer some criticism, inserting the screen into the Flip Grip feels a little too snug for my taste. It seems as though Flip Grip is leaving faint marks on top of the Switch after inserting and removing it a few times. This may be a design flaw or it may be an error on my part. Regardless, it didn't detract from my enthusiasm for the product.

While there don't seem to be many original shmups developed for Switch, there are a number of excellent ports available. I tested Danmaku Unlimited 3, Strikers 1945, Strikers 1945 II, Samurai Aces, Dragon Blaze, Gunbird, and Gunbird 2 and they all looked and played great with the Flip Grip. The added screen real estate helps with immersion and really draws you in. Audio is crisp and clear from the Switch's speakers too. While it's nice that these games allow for a vertical mode, the menus were still stuck in horizontal mode with the exception of Danmaku Unlimited 3, making it a little clumsy to cycle through them. Not all vertical shmups offer the option to play in Tate mode either. Surprisingly, a newer vertically scrolling shmup, Shikhondo - Soul Eater, doesn't support Tate mode at all. The issues mentioned have nothing to do with Flip Grip, but I would like to see broader developer support going forward. There is no reason not to support this wonderful slab of black plastic.

To anyone who doesn't play shmups or other titles that depend on a vertical screen, Flip Grip isn't for you. But for those who do, shmup fans in particular, this isn't simply a device, it's a gift. It's a love letter to a group of gamers who are often overlooked by the mainstream. And because of Flip Grip, there is a real case to be made that Switch is a shmup machine (almost) in the same ballpark as the very best classic consoles. Sure, Switch may lack original shmups, but that's OK. The Switch library is like a greatest hits collection of some of the very best of the genre, and Flip Grip allows you to play vertically scrolling titles precisely as they should be experienced. It may seem simple, but it feels magical.

So, what are you waiting for? Get a Flip Grip today.

https://www.fangamer.com/products/flip-grip

Old Atari on Switch and New Atari on 4 Switchers

HEAVY 6'S AND LIGHT 6'S TOO

By Ryan Burger and Ric Pryor

New Atari-related releases are coming fast and furious, from many different directions recently. AtariAge.com has been publishing tons of new games, many of which were first released at the Portland Retro Gaming Expo and to the public quickly afterwards. Additionally, Atari is constantly re-releasing its Flashback Classics series on new game consoles as the new generation comes out, this time on the Nintendo Switch, which was one of the reasons I bought the Switch!

2600 RELEASES ON NEW HARDWARE BY RYAN BURGER

Atari has now released Flashback Classics Series for the Nintendo Switch with 150 games included in the download (now available in download and physical format). It includes approximately 30 arcade games, including favorites like Tempest, Crystal Castles, Warlords, and Asteroids. Some of the games are also set to go into Tabletop mode, where you can use a Flip Grip to turn the screen on its side in Portrait Mode (Flip Grip Review by Rob Faraldi also in this issue). The other 120 games in the system are first party titles developed by Atari in-house back in the late 1970s and early 1980s. Some

of my console favorites included in it are Adventure, Fatal Run and the Sword Quest Series including Water World. I still have to play through the Sword Quest series, which I intend to do soon. While the first two games in the series, Earth and Fire, are pretty common, Water is a very rare cartridge, and this is one of the few ways you can play it without shelling out big bucks. Yars Return (the sequel to Howard Scott Warshaw's Yars Revenge is also included, which debuted back on the Flashback 2 in 2005.

Can't find a friend locally to play Atari with you on your Switch? That was sometimes a problem back in the day when we were all trapped inside on a Snow day in Ohio, but now you can play over the Internet with others. I think I need to find a community of FlashBack for Switch users to be able to schedule competitions, as no one popped up while I had the host mode enabled this evening. If anyone that knows of such a community please contact me at rb@oldschoolgamer.com. Most, if not all, of the games had such great functionality, plus Leaderboard and Achievement systems have also been added. They have also included original arcade bezel art in the gameplay screens, manuals for console games, multiple versions of some games (2600/5200/Arcade), and more! Personally, I would love for them to add all the 7800 games that were released in a similar collection, but it seems more people have the nostalgia for the 2600, 5200 and the
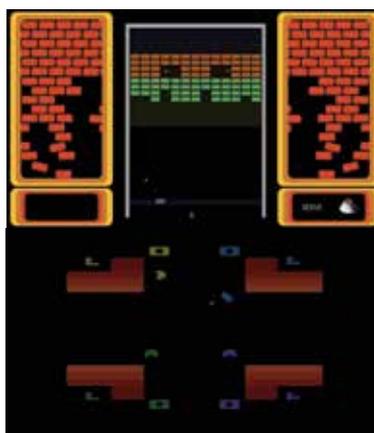
Arcade releases, understandably.

This is a really comprehensive archive of Atari titles from the 70s and early 80s. With all the ways to play Old School console games, this is one of the more elegant interfaces and collections out there.

atari.com/games/atari-flashback-classics-switch/

ATARI 2600 NEW RELEASES
BY RIC PRYOR

Mappy

Anyone who follows the Atari 2600 homebrew scene knows the amazing work Champ Games has done bringing classic arcade games to the VCS. Anyone who hasn't been following the Atari 2600 homebrew scene, and particularly the amazing work Champ Games has been doing, should start right now with Mappy. In this port of the 1983 Namco game, the player controls a police mouse recovering stolen goods from the hideout of a gang of literal cat burglars who, for reasons I'm sure seemed like a good idea to them at the time, have replaced all of the stairs with trampolines.

Mappy is an astoundingly faithful port of the original game. So faithful that I would feel no reservations whatsoever about deleting the Mappy arcade ROM from my computer if I were the sort of person who had a hard drive full of illegally obtained ROMs that I played using a certain multi-arcade emulator...which I am not. Wink wink.

Space Game

It's not difficult to find yourself getting hung up on Space Game's unimaginative name. Is it supposed to be ironic? Has the English language finally run out of words that can be combined with "Space" to create a video game title? But when you actually play Space Game, you'll discover that all the effort that didn't go into creating a clever title went into making a first-rate shooter.

Created by Karl Garrison and Maggie Vogel, a couple working on their first Atari homebrew together, Space Game takes place, obviously, in space. Charged with defending humanity's colonies from the alien Kraal, you fight wave after wave of invading enemies, collect power ups, and face off against giant bosses. Not exactly uncharted video game territory, but Space Game packs a lot of variety into its tried and true premise, including a large variety of aliens with unique attack patterns, two different bonus stages and an excellent soundtrack. If you like space games, Space Game is definitely worth a look.
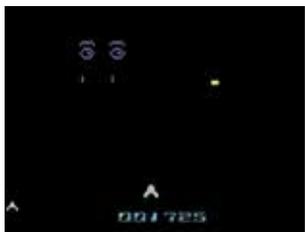
Dungeon II: Solstice

In theory, I love role-playing games. I like the idea of creating and growing a character while solving puzzles and exploring a large, open world at my own pace. In reality, the first time my character misses a couple of attacks in a row and is killed by a low-level goblin I'm only fighting to grind out some XP, I switch the game off and turn on an episode of The Great British Baking Show.
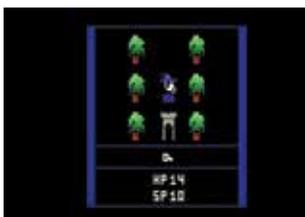
Dungeon II by David Weavil looks and feels every bit like the classic PC role-playing games it seeks to emulate. You move your character, either a Wizard, Faerie or Warrior, through a tile-based world, engage in turn-based combat with a variety of evil creatures and find the magic artifact that will return peace and prosperity to the land. But because it's a relatively short game with no character progression and randomly placed items, it often feels more like game 3 of Adventure than Ultima III. If you're jonesing to fight some orcs but aren't looking for a long campaign, Dungeon II is a good way to get your fix.

Anguna

If your tastes lean more towards Legend of Zelda style action RPGs, Anguna checks most of the boxes on your checklist. In Nathan Tolbert's semi-sequel to his 2008 Game Boy Advance homebrew of the same name, you control an unnamed hero who has been captured by the forces of the evil Goblin King. Once you've escaped his dungeon, you have to find the Goblin King and defeat him.

While Anguna's graphics and sound effects aren't as impressive as other recent 2600 homebrews, the sheer depth of the gameplay easily makes up for the lack of eye and ear candy. The world of Anguna is impressively vast with a large overworld and multiple dungeons populated by a wide assortment of creatures. Using the Color/B&W switch toggles between the game action and a status screen with a map and a password that lets you pick up where you left off next time you play, a welcome addition to a game of this scale. There's more to Anguna than can be done justice in a two-paragraph review. It's a game that will keep you playing for a very long time.

Assembloids 2600

Sticking with the theme of homebrews for other platforms adapted to the 2600, Assembloids is Martin Wendt's VCS port of his 2012 Commodore 64 homebrew, which is itself an adaptation of Ilija Melentijevic and Richard Davey's 2010 Flash game Quartet. The goal is to complete creatures by moving tiles into empty spaces on the screen, with more points awarded for making a creature with four pieces of the same color.

The gameplay is simple but, like all good puzzle games, challenging and compelling. As the game progresses and you are given less time to move each piece, Assembloids becomes a frantic test of your reflexes. The creature graphics are impressive with new monsters to discover as you progress. Assembloids is unique and addictive and a welcome addition to the 2600's lamentably small library of puzzle games.

Atariage.com

Entering the Digitized Era – Part 1

By Warren Davis

In the beginning, there was the dot. The white dot. Alone in a void of blackness. This was the world of Pong, Computer Space, Breakout and many more. Crude graphics and no color. These were the earliest arcade video games – many implemented solely through hardwired circuitry, no CPU, no software. Some using rasterized graphics, some vector graphics. Some tried to imply color by using cellophane overlays, but let's face it. They were still black and white.

There's some debate about which arcade game was the first to introduce colored pixels. Galaxian was probably the first hit game with multi-colored raster graphics (in 1979), even though there were others before it. And Tempest is considered the first game using multi-color vector graphics in 1981. Once we were in the world of color, there was no going back. In this article, I'm going to talk exclusively about rasterized graphics.

In the early days, colors were extremely limited. Systems usually had a color resolution of 2 bytes (or 16 bits) per color. That meant a color consisted of 5 bits of Red, 5 bits of Green and 5 bits of Blue. That translated to 32 shades of each or 32,768 possible colors (32x32x32). If a game system had enough screen memory to allow for 2 bytes per pixel, then every pixel on screen could have any one of those 32,768 colors. We'd call that a "true-color" display. But memory back then was expensive, so to keep costs down, screen memory was generally limited to show only a small subset of the possible colors. This subset was called a "palette". So instead of storing 2 bytes for each pixel, you stored an index

A couple of digitizers for the Amiga computer from the late 1980s. On the left, Live by A-squared and on the right, Digi-View from NewTek, showing the color wheel you had to shoot through

into the palette. For a 16 color palette, that would require only 4 bits, you could fit two color indices into a single byte. That made screen memory 4 times smaller than a "true-color" display would have been.

A 16 color standard was fine for games like Defender, Berzerk and Space Invaders (a game originally built for black and white, then re-released with actual color hardware), which still used blocky, monochromatic, simple graphic shapes. But most developers in this still fledgling industry didn't want to maintain the status quo. They wanted to push the envelope.

Color resolution wasn't the only limitation, of course. There was also pixel resolution. Most arcade systems supported a display that was 256 pixels across and 240 pixels tall (when oriented hori-

Black and White	1 bit per pixel	8 pixels fit in 1 byte
16 color palette	4 bits per pixel	2 pixels fit in 1 byte
256 color palette	8 bits per pixel	1 pixel fits in 1 byte
32,768 true color	15 bits per pixel	1 pixel fits in 2 bytes
16,777,216 true color	24 bits per pixel	1 pixel fits in 3 bytes

Color representation using...
15 bits

| 5 bits Blue | 5 bits Green | 5 bits Red | 2 bytes |

24 bits

| 8 bits Blue | 8 bits Green | 8 bits Red | 3 bytes |

This table shows how memory requirements change with different color resolutions, from B&W to 24-bit true color

zontally). The monitors were usually 19 inches diagonal. This puts you in the realm of about 20 dots per inch. Not so great. But the limitations weren't stopping people from flocking to arcades and pumping quarters into cabinets. So the manufacturers didn't feel any need to spend more money on higher resolution components.

And the artists of the day rose to the challenge, despite these pesky technical limitations. Pac-Man took the industry a major step forward. Released in 1980, the characters in Pac-Man were still somewhat simple, but evolved beyond adjectives like "blocky" and "crude" to become what would define arcade game graphics over most of the next decade..."cartoony". The characters seemed to have personalities, despite being somewhat monochromatic. It turned out there was a lot you could do with 16 colors. Some games, like Donkey Kong, used larger characters to allow them more detail and definition. Q*bert added the illusion of a third dimension as did Zaxxon.

But for me, at that time, the holy grail of taking arcade games to the next level would be a 256 color palette system. This would require one byte per pixel to store an index between 0 and 255, which would double screen memory, but it would also allow graphics to look much more photorealistic than was possible

with only 16 colors. And I believed very strongly in moving video games closer to photorealism.

The year 1983 marked the beginning of a laserdisc fad in the industry. With the success of Dragon's Lair, every major manufacturer started working on a laserdisc system. I think most people in the industry thought that was the future. Who needed more colors when you could have virtually unlimited colors on your laserdisc? But that all fell apart pretty quickly when operators realized the disc players inside the cabinets weren't ready for prime-time. All you had to do was bang the side of the cabinet, the disc would skip, the game would crash and you'd ask for (and get) your money back. Not very good for business.

In 1986, I was working for Williams, and memory had gotten cheap enough that a 256 color arcade game system was looking like a viable next step. This meant rethinking the way we generated our art. In a 16 color world, our art tools were fairly simple. We'd have software that put up a large grid representing a sprite. The artist would then choose the 16 colors in their palette and literally pick a color and drop it into a space in the grid. They had to do this manually for every pixel in every image. Most artists planned their sprites out on graph paper and used the art tool last to generate the sprite in memory. This was before Photoshop existed. Microsoft Paint had only just been released in 1985.

But in a 256 color world, doing all that manually was going to be ridiculously time consuming. What else could we do?

I'd heard about a video digitizer that was available for the Amiga computer. It was made by a company called A-Squared and it allowed you to attach a black and white CCTV camera to the Amiga, and through a process of shooting video over about 30 seconds through a rotating color wheel with 4 filters... red, green, blue and clear... you could generate what looked like a true color photographic image on your computer screen.

This was pretty close to magic in 1986.

The image on the left is a true-color image with thousands of colors available. The image on the right has been reduced to 256 colors, with the palette shown under it. You might be able to see some of the artifacts introduced by reducing the number of colors. Note: this palette was created with modern tools, which have algorithms that yield much better results than those available in the 1980s.
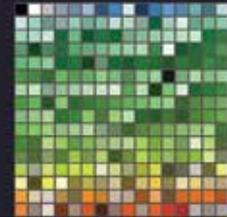
We had some Amigas around the office, so I made sure to get one of these digitizers to play with. The results were amazing, but not very practical. For one thing, whatever you were pointing the camera at couldn't move. And spending 30 seconds turning a wheel to get one image wasn't particularly efficient. Plus the setup required a specific type of camera used for surveillance. You couldn't just plug in any consumer camcorder or VCR and pause videotape playback to grab a single frame out of a motion sequence. So it just wasn't practical for our purposes.

In addition, the images generated by the digitizer were "true-color" with up to 32,768 colors, not 256. It occurred to me that at some point, I was going to need some new tools to generate a 256 palette from a series of digitized images. The problem was, those tools didn't exist! So I was going to have to write them myself. I started going to libraries and digging

into technical journals, sifting through the latest algorithms being developed. Compared to today, the 1980s was still the dark ages of computing. So much of what we take for granted now just didn't exist then, or was in some early theoretical stage of development.

I managed to find some algorithms related to what was called "color quantization". This is basically a fancy name for the process of finding a subset of colors from a larger group of colors to best represent a particular image. Exactly what I needed! I implemented the methods I found, and tested them on a varied selection of "true-color" images. They worked! Kind of. I mean, the results weren't quite as photo-realistic as I was hoping for – if the source image had a lot of colors, the "paletted" version could have a lot of artifacts - but they were way better than "cartoony".

Meanwhile, unbeknown to anyone, the crucial piece of the puzzle – a digitizer suitable for our purposes – was being developed by a small R&D group working within AT&T in Indianapolis. The story picks up next time with Part 2.. 🎮

Warren Davis is a classic videogame creator best known as the designer and programmer of the original Q*bert arcade game. He also co-designed and programmed Us. Vs. Them, an innovative laserdisc title featuring scenes with live actors interspersed with sci-fi combat gameplay composited over actual flying footage. His other titles in the arcade industry include Joust 2 (for Williams), T2:Judgement Day and Revolution X (for Williams/Bally/Midway). He was a pioneer in the use of digitized video. His WTARG system was used in many of Williams' most successful games, including NARC, Hi Impact Football, the Mortal Kombat and NBA Jam series', T2, Revolution X, and more. In 1995, Warren moved to Los Angeles to work for Disney Interactive on a variety of home titles. For a short time, he was an Imagineer with Walt Disney Imagineering. After Disney, he worked as a senior programmer on the console game Spyro: Enter the Dragonfly, and programmed an edutainment title, The Lunar Explorer, and spent some time at Industrial Light and Magic.

Intruder Alert...Intruder Alert!

By Kevin Butler

NAME: BERZERK

MANUFACTURER: STERN ELECTRONICS

YEAR: 1980

TYPE: VIDEOGAME

TEAM LEADER: DESIGNED AND PROGRAMMED BY ALAN MCNEIL

Berzerk is a two-dimensional maze-style game that involves you attempting to escape killer robots in a never-ending gallery of mazes. Somewhat simple in design, Berzerk can also be fiendishly devious depending on where you get located in the next maze. The robots are programmed to terminate you with extreme prejudice and they do their job well. One of the most unique aspects of this game is that it has speech (to be precise, a vocabulary of 24 words). Depending on what one rates as speech (via a speech data ROM or through electronic means with no data ROM), it is either Berzerk or Stratovox (also made in 1980) that can be considered the first game to incorporate speech. Berzerk is also considered to be the "grandfather" of Robotron 2084, since Eugene Jarvis cites it as being his inspiration to create a game of this nature but with significantly more intensity. For a more detailed description of the game and gameplay, go to https://gamefaqs.gamespot.com/arcade/584080-berzerk/faqs/24584 for my FAQ.

Berzerk can be considered a game with two components. The first component itself is the game. The game consists of the player, robots, Evil Otto (named after a disliked boss), and the various mazes. The player is controlled via an eight-way joystick and a fire button (aim controlled by eight-way joystick). There are 876 unique mazes you can go through (more explained later on how this works). The second component is the speech component itself. Speech is provided by the TSI S14001A chip. The TSI S14001A used a data file with the 24 words to provide the speech for Berzerk. This is what gave Berzerk its uniqueness among video games up to that time.

During these early days of arcade games, the goal was to create a game with as few chips as possible. This meant programming space was at a premium and one had to get the most amount of program in the least amount of space. Alan had 8Kb of ROM to create this game. This meant everything from the mazes to the AI of the robots had to be put into that small space. Creative programming was a must and Alan was able to implement some unique programming to get the most out of the 8Kb. Since Alan already was well versed in computer graphics, he was able to design all the various parts of the game (player, robots, Otto, e.g.) - it was the maze that was a challenge. Alan realized that he couldn't put hundreds of completed mazes into the program or they would definitely take him way beyond the 8Kb he was allotted. This meant he had to find another way to do it. He did this by creating a maze generator by using a 16 x 16 "box" in which the mazes were created. This gave 65536 possible rooms. After eliminating all the duplicates, you end up with 876 unique rooms. The maze generator started at the zero room. A random number was then generated and it provided the "seed" for the next room to be created. This enabled a player to traverse an apparent endless array of mazes. One unique feature was that the game would remember the last room you were in and, if you backtracked, you would end up in the same maze you left. After various tweaks and play testing, Alan had achieved a true miracle by getting a lot of content into a very small space.

Unfortunately, Alan McNeil passed away in December 2017. I was able to talk to his brother Bruce McNeil and get more information about Alan before he created Berzerk as well as things that Alan did during and after Berzerk.

OSG: *First of all, I would like to express my condolences and sympathies on the loss of your brother.*

BRUCE McNeil (BM): Thank you, I appreciate that very much.

OSG: *How did Alan get involved with computers? Was he involved during his high school years?*

BM: During his junior and senior years in high school (1969-70), he was involved with hobbiest computers. In addition, he did work with the bigger IBM systems doing punch cards for the IBM Fortran.

OSG: *Did he continue with computers when he graduated?*

BM: Yes and no. From 1970-71, he studied architecture at Cornell for a year. After that, he went into art studies at the University of Illinois in Chicago. At that time, he began to work with another professor in creating primitive computer graphics. He was also involved with developing the gas plasma display for computer-based art for the PLATO system, plus creating the first user groups. Eventually, he graduated with a BA in art.

OSG: *Did he continue along the art and computer track?*

BM: He did. First he started to learn programming so he

STERN GOES BERZERK!

If you think we went crazy developing Berzerk, you're right! This is the first time we've ever put all of our technology and wit to work in one video game. The result is a video masterpiece that not only drives players absolutely Berzerk, it drives profits directly to operators.

THE BERZERK LINEUP OF INNOVATIVE FEATURES:

- Unsurpassed 30-word vocabulary allows game to communicate to player.
- 64,000 random maze patterns appear on video screen for explosive—and non-repetitive—action.
- Newly designed "Joy Stick" enables player to move image of humanoid in 8 different directions.
- 10 highest scores-to-date register on screen after play is over.
- Memory also stores 5 highest scores-to-date, even when machine is unplugged.
- Attract mode beckons players by voicing— "Coins detected in pockets"—at timed intervals.
- All logic boards housed in accessible pullout drawer in cabinet front, providing easy service for technicians.
- Sophisticated self-diagnostic programming routine.

PLAY FEATURES
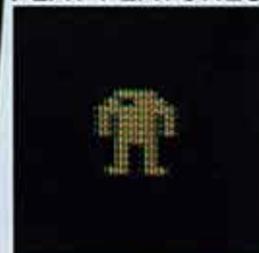
Robots pursue humanoid (player) through one of 64,000 possible maze patterns.

Humanoid avoids robots by manipulating "Joy Stick" and destroys robots by firing weapon.

"Evil Otto," an indestructible force, appears randomly on screen to pursue and destroy humanoid. He must be avoided at all costs!

"You'll really flip over this game, too!"

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Chicago, Illinois 60614 (312) 935-4600
Telex 25-4657/Toll-Free Service No. (800) 621-6424
Designed and developed by Universal Research Laboratories, Inc., a Stern subsidiary.

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Cleveland, Ohio 44114

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33-985-A

could apply his art along with computer graphics. During this period, he also built an Altair computer, from a kit, to further his knowledge of computers. While working at a computer store, he learned about programming graphics on the early microcomputers. In addition to this, he also dabbled in trading using the primitive computer systems that were in place at that time.

OSG: *When did he get involved in the arcade industry?*

BM: In 1978, he was approached by David Nutting and Associates (DNA), which was owned by Bally/Midway, to work on a couple of their arcade games and eventually to work on the Bally Astrocade. Unfortunately, problems developed with the system and it never was able to be marketed. So Alan asked David Nutting, owner of DNA, about designing his own arcade game. He was told that he wouldn't be able to due to lack of experience and it would take at least two years for him to have the necessary experience. Alan didn't take that too well and left. As luck would have it, Stern Electronics was looking for programmer so he applied. The job involved reprogramming their pinball machines.

OSG: *So, he started in the pinball industry instead, after wanting to go into the arcade industry.*

BM: Alan learned how the pinball programs worked by reverse-engineering the programs that ran the pinball machines and rewrote them so the machines would be more flexible. Alan's condition for doing this is that he wanted to design an arcade game. Stern was happy to comply since they wanted to break into the arcade industry.

OSG: *The oft told story is how Alan had a dream that led to Berzerk being developed. Can you add any background to this?*

BM: Alan liked to experiment a lot. I know on his early computer systems he used to try to program robots on his old computer system but that didn't exactly turn out the way he wanted. The idea, though, stuck and when given the green light by Stern, Alan already had an idea of how to do things.

OSG: *Did Alan do the game himself or did he have others help him?*

BM: No, Stern was just starting out in the arcade industry so he did it all himself. The artwork, graphics design, programming, and all the debugging were done by him. He was a one-man department, so he pretty much had total freedom to do what he wanted. Alan was a perfectionist, so the game went through several revisions to get it right.

OSG: *How did he manage to get speech integrated into the game since this is one of the first (if not the first depending) arcade games that had true speech synthesis?*

BM: Alan originally had the game making the usual electronic noise usually associated with an arcade game. He said that one day, someone came around and said they had a chip that allowed blind people to hear what they were doing. The chip itself was limited to 24 words but that was all that was needed

at the time for the products coming out that utilized this chip.

OSG: *It seems that he is most associated with Berzerk since that is the game he designed. Was he pretty happy with the final product?*

BM: He was, for the most part. There were things that he wanted to do but unfortunately, hardware limitations and budget restricted him in what he could and could not do. He programmed Frenzy as a direct sequel to address these shortcomings but it never really came to fruition. By the time all this was going on, his time with Stern was ending.

OSG: *He didn't design any further games with them?*

BM: No, he had other projects in mind and wanted to go out on his own.

OSG: *What did he do after he left Stern?*

BM: He went back to his first love and that was graphics and multimedia. With the advances made in computers and hardware, he was able to do more with his love of art and programming. He developed the program that became Adobe Director and he also worked on other projects of this nature. He was with SSI for a time and he did his own work in the late 80's. Microsoft even offered him a job working with their multimedia division and also with designing the hardware that could run it.

OSG: *Sounds like he did pretty well for himself. What did he do for entertainment?*

BM: Well, his favorite games were Might and Magic, Wizards, and a lot of the MMORG's that were coming out. He enjoyed the fact that you could go online and play these. This was a dream of his from his days working on the PLATO system which worked somewhat similarly but was a lot more primitive.

Bruce and I discussed other facets of Alan's life and all the other projects he was involved with. I thanked Bruce for his time and again expressed my condolences on his loss.

As stated above, fate would step in when a salesman came by selling a speech chip. Alan immediately became intrigued and the rest is history. Various words and phrases were included, such as "intruder alert, intruder alert", "chicken, fight like a robot", and "the humanoid must not escape". Putting together other words gave other phrases and gave more "life" to the game. The oft quoted price per word was $1000. I contacted Todd Mozer who is a cofounder of Sensory Inc. Todd is the son of Forrest Mozer who patented the algorithm and hardware for the first speech synthesizer that used true speech. Todd relayed that his dad had the specialized equipment for creating the digitized speech from record-

ings. His dad then would take those digital recordings and place them into a speech ROM for the speech synthesizer to "read". Todd figured that since his dad was the only one doing this, it could cost anywhere from $700 to $1000 to create the chip with those words on it. This was a one-time cost, since after the chip was created, it could then be duplicated. In talking to David Carver, a tech support engineer at Stern Pinball Inc., he believed that with the utilization of the TSI S14001A chip, Berzerk was the first arcade game that had true speech. The way the speech synthesizer chip worked was actually pretty simple in theory. A command would be received from the game to implement speech. Said command would hit the TSI S14001A chip. The TSI S14001A chip would than find the address of the specific word or words that were needed and draw them from the speech data ROM.
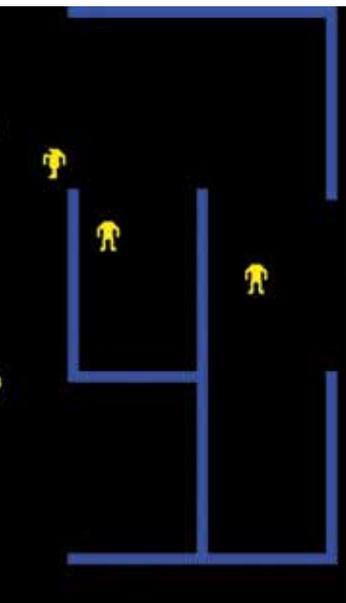
I had the honor and privilege of talking to Ed Bernard. Ed is the individual who designed the TSI S14001A speech chip that was used in the Berzerk game for speech.

OSG: *Thank you so much for talking to me Mr. Bernard. Did you start working with computers in high school?*

ED Bernard (EB): When I was in high school in the early 1960's, computers really weren't an integral part of the classroom. In addition, the primary computers were the mainframe systems that were very large. No, I was more involved with electronics and learning in that area.

OSG: *What did you do after high school to further your electronics knowledge?*

EB: I went to Oregon State University from 1962-1966 and got my BS in both physics and math. Also, my experiences with computers actually started with the ALWAC III-E system we had at the college. This computer system used a rotating drum memory. I then attended Cal Tech and got my MS in Physics in 1968. My first job was working at North American Rockwell doing plated wire memory for 1.5 years. From November 1969 to March 1970, I went to work at Xerox Data Systems (XDS) on their plated wire memory project. I then transferred to their integrated circuit group where I developed a MOS model circuit simulation for them.

OSG: *When did you start working on chips and integrated circuits?*

EB: My big break came in May 1973. A man by the name of Gene Potter founded a company called Silicon Systems Incorporated (SSi). At XDS, he managed a group designing bipolar ROM and RAM. Gene was a wonderful mentor and friend, and I learned a lot from him. I was an early employee hired by Gene. SSi had a contract with Signetics and I was picked to be in the group that helped create the bipolar chips and also to create the integrated circuits. In addition, I served as the liaison for developing a mini-computer 8-bit interface chip. I continuously worked on custom designs for creating the chip templates from provided algorithms.

OSG: *How did you get involved with the TSI S14001A?*

EB: Telesensory Systems Inc. (TSI) came to us to design a speech chip for them. The algorithm was based on Forrest Mozers theories of digitizing and compressing speech. They needed a chip to make this speech to assist those who were sight impaired. Their project would be a talking calculator. I was the one responsible for designing the chip based on that algorithm. In 1975, I designed the die for that chip and the first chips were produced. The chip was used in the TSI Speech+ calculator which was released in 1976 and became the first calculator to actually use speech (which was stored on a data chip in compressed form).

OSG: *That must have been quite a thrill to know you designed a chip that would potentially help millions of people and also to lead to bigger things.*

EB: It did and I was very proud of the job that we did getting that chip out so it could be used in the calculator. When I saw the end result, I was pretty impressed and I even got one of those calculators.

OSG: *What did you do after the TSI project?*

EB: Among other things, I helped to design a targeting system for Hughes Aircraft, designed transmitter and receiver chips for garage door opener electronics and developed an in house test system. I left SSi in 1984 and effectively retired. Since then, I've been able to dabble in many different projects and relax.

Mr. Bernard and I talked a bit more about various computer and electronic things. I want to thank Mr. Bernard for taking the time to talk to me and help me to get the other half of the story.

Getting back to the maze generator, to get an idea of how little code is required to generate mazes, head to this site: https://rosettacode.org/wiki/Maze_generation#BASIC. On this site, there is code for a multitude of BASIC's but they all achieve the same thing, generating a randomly created maze.

I wish to thank Bruce McNeil, Ed Bernard, Todd Mozer, and David Carver for their assistance in writing this article. I would also like to state that although Alan McNeil is no longer with us, his legacy will live on, not only for creating one of the first (if not the first) arcade game with speech, but for his many other creations throughout his lifetime. 🎮

Kevin Butler - He has played video and arcade games since the early 1970's until he joined the Navy in 1983. While in the navy, he continued his hobby of programming (Worked for Majicsoft in the mid-1990's which specialized in Atari ST games) and playing video games. After retiring from the navy in 2004, Kevin started to write FAQ's for GameFAQ's specializing in doing retro-arcade games. These FAQ's have also been a part of the MAME project in regard to gameplay and history. He currently lives in Neosho MO with his wife and son, who is also a video game hobbyist.

2019 OSG EVENTS CALENDAR

MORE DATES ARE PLANNED FOR 2019...

SPRING

MARCH 1-3
Louisville, KY • Louisville Arcade Expo • *epinball.com*

MARCH 9-10
Pittsburgh, PA • Pittsburgh Retro Gaming • *pittsburghretrogaming.com*

MARCH 15-17
Banning, CA • Arcade Expo • *arcadeexpo.com*

MARCH 23-24
Mohegan Sun, CT • CT Gamer Con • *ctgamercon.com*

MARCH 18-22
San Francisco, CA • Game Developers Conference • *gdconference.com*

APRIL 12-14
Milwaukee, WI • Midwest Gaming Classic • *midwestgamingclassic.com*

APRIL 26-28
Las Vegas, NV • Level Up • *lvlupexpo.com*

MAY 18
Cincinnati, OH • Cinciclassic • *cinciclassic.com*

SUMMER

JUNE 1
Seattle, WA • Seattle Retro • *seattleretro.com/events*

JUNE 8-9
Washington, DC • All Star Comicon • *theallstarcomiccon.com*

JUNE 11-13
Los Angeles, CA • E3 • *e3expo.com*

JUNE 21-23
Philadelphia, PA • Too Many Games • *toomanygames.com*

JUNE 28-30
Irving, TX • Lets Play • *letsplaygamingexpo.com*

JULY 12-14
Atlanta, GA • Southern Fried Gaming • *southernfriedgameroomexpo.com*

JULY 13
Chicago, IL • Video Game Summit • *videogamesummit.net*

JULY 20
Cleveland, OH • CCAG • *ccagshow.com*

JULY 26-28
Cherry Hill, NJ • NJ Gamer Con • *njgamercon.com*

JULY 27-28
Austin, TX • Classic Game Fest • *classicgamefest.com*

AUGUST 1-4
Pittsburgh, PA • ReplayFX • *replayfx.org*

AUGUST 9-11
Phoenix, AZ • Game On • *gameonaz.com*

AUGUST 10-11
Garden City, NY • LIRetro • *liretro.com*

AUGUST 23-25
Minneapolis, MN • 2D Con • *2dcon.net*

FALL

OCTOBER 18-20
Portland, OR • Portland Retro Gaming Expo • *retrogamingexpo.com*

OCTOBER 19-20
Arlington, TX • Retropalooza • *retropalooza.com*

The Wonderful World of Arcade Simulators

By Adam Pratt

The gaming business loves to abbreviate descriptive terminology. VR is one of those that has made headlines over the past few years, although it is hardly the only "Reality" technology that is worth writing about. You have Augmented Reality (AR), Mixed Reality (MXR) and the granddaddy of them all, Simulated Reality (SR). I'll be honest though…almost no one uses the term SR for anything except for myself. They tend to just stick to saying "simulators."

Arcade manufacturers have been producing Simulated Reality games pretty much since the beginning of video games, as they are more capable to do so as every generation passes, thanks to the hardware component innovations that go into every game. While game consoles and computers can offer a simulator game on the software side, there is always something that is missing when you don't have realistic controls at your disposal – be it a steering wheel & gas pedal, a flight stick, a gun, and so on. Home systems can offer that via accessories, but nothing beats the sturdiness, the quality and the distinct feel that you get from having that simulation brought to life with an arcade cabinet.

In the interest of space, I'll not cover every arcade game that ever bothered to simulate a real world device with its cabinet and controls, but I will look at some of the more notable and important simulation games.

Even today, racing games still manage to be some of the top earning titles you find in arcades, so let's start there. Atari would create the first true video racing game with Gran Trak 10 in 1974. While the software was rudimentary by today's standards, the cabinet itself recreated the feel of being at the helm of a real driving machine. It proffered users a real steering wheel, gear shifter and foot pedals as the means to control their on screen counterpart. The game was also notable for being the first title to have used ROM memory for digitally storing content.

The next innovation that would deepen the simulator feel came a year later when Atari launched Hi-Way. The addition with this game was the simple idea of allowing the player to sit down at the cabinet. This idea would be repeated the following year when Atari released Night Driver, a game that holds historical significance along with Midway's 280 Zzzap for

Atari Hi-Way and TX-1 Image above provided by Arcade-Museum.Com

being the first games that allowed you to race in first person. Then in 1977, Atari, under the Kee Games label, created Drag Race, a realistic drag racing simulator that featured real, functioning tachometers on the control panel. That's a simulator feature that is sadly missing on most modern arcade machines, as it drives up the cost of already expensive game cabinets.

Sit-down racing games would set the stage for a new class of arcade cabinets that comfortably find themselves in the simulator space – the cockpit cabinet. Exidy was the first company to come up with the idea of adding a ceiling to sit-down games when they launched Star Fire. With that, players felt like they were sitting inside of a real starfighter craft, an effect that was used with excellent results in other iconic games like Atari's Star Wars, Sega's Star Trek, Midway's Sinistar and many others. Racing games were also quick to jump onto this idea, as you had Namco's Pole Position games make use of it, as did TX-1, a high tech game that played much like Pole Position did, but it made use of 3 monitors to create a wide panorama effect of the game scene.

Namco's Pole Position series would also eventually lead to another major innovation in gaming that expanded the fun of simulated living when Final Lap introduced networked cabinets in 1987. Prior to this, the only way to get a multiplayer experience on an arcade machine was to offer multiple steering wheels on the same cabinet. This did work in some instances, including the 8-player monstrosity Sprint 8. But that was quite the exception to the rule, since it wasn't feasible for every arcade release to copy such a design.

I'd also be remiss if I didn't mention another major player in the racing simulator realm – Sega. They might not have been responsible for some of these "firsts" that have been discussed so far, but they were very important in the creation of many iconic games that would use the arcade format to simulate an experience that no home console could accurately capture.

Sega mainly followed Atari's lead in the 1970's, but that wasn't always the case. They and Midway had been in the business of creating

RIDGE RACER FULL SCALE

electromechanical arcade games through the 1960's, a few of which were racing games. A few of those EM games involved motorcycles, so when Sega got into video, one of their first efforts was to make a motorbike game that was called Fonz. This pretended that you were the popular character "The Fonz", riding the streets on his bike, although the game did not get permission to use his likeness. Still, it used a realistic handlebar that set the stage for their fantastically realistic motorcycle racing game Hang-On in 1985. To compliment the exciting "Super Scaler" gameplay, Sega created a deluxe version that was shaped just like a motorcycle. Users could adjust the direction of their bike not just by using the handlebar, but the seat was set on a swivel base so you could rock from one side to the other. This design is still used in motorcycle arcade games today, which you'll notice when you come across the new Super Bikes 3 at a modern arcade.

Both Sega and Atari got into some friendly competition with racing simulators in the 80's – Sega with OutRun and Atari with Hard Drivin'. Both of them had cutting edge graphics for their respective designs, but our focus is more on the hardware, so that's what we'll discuss.

OutRun was produced in three main flavors – upright, sit-down standard and the sit-down motion. The latter model is of most interest, as this launched another new series of arcade cabinets, ones that would simulate motion in the seats. While a few different methods exist for causing the arcade seat (or

Star Wars and Outrun Cockpit Image above provided by Arcade-Museum.Com

whole cabinet) to move, most from this era involved using electric motors attached to gears to produce a variety of movement effects.

Hard Drivin' would not have the motion aspect to it, but it was focused on simulating a driving experience in every other aspect. Sitting down at the wheel, you had to take an unusual step to begin the race – not just inserting coins, but you had to turn the ignition key to start the car. The gameplay also allowed the user to drive around with a bit more freedom than arcade goers would be used to, thanks to the 3D graphics.

Speaking of 3D graphics, many arcade titles would increase their realism thanks to this technique. The list is too extensive to get into, but some of the most iconic simulator games of all time would further draw the player into their virtual world using increasingly elaborate texture mapped polygons. Sega's Daytona USA would go on to become one of the highest grossing arcade games of all time, which was also boosted by the in-game realism of the vehicle handling, force feedback and the physics model; Midway had the Cruis'n series, Atari Games had San Francisco Rush, while Namco had Ridge Racer. Speaking of the latter, Namco created an incredible "Full Scale" version of that game which featured a real, full-sized car that you and another person could sit in behind an 18' projected screen. This car had a windshield, rear view mirrors, a clutch and the A/C even worked! Unfortunately, coming across one was rare even when they were new, but if you did have such a chance, you probably didn't forget about it.

More could be said about the racing games to grace the scene, but that would prevent us from highlighting other titles

that fit into the simulator realm. If it's a vehicle, then it can be simulated in many ways, thanks to the arcade cabinet; war vehicles such as tanks, helicopters, submarines, hovercraft, boats, starfighters, combat jets and so on are particularly good examples of this that you probably recall coming across at the arcade a time or two. Some of the more famous examples I can pull from that roster include Atari's BattleZone and Steel Talons; Sega's AfterBurner (which also had a motion version) and Thunder Blade; Namco's Cyber Sled and Tokyo Wars; Konami would launch a whole new genre of music games that could be classified as simulators (be it dance or music playing) with their "Bemani" titles that included the likes of Dance Dance Revolution and Taito had simulators like Battle Shark and Air Inferno.

The sports arena was also a great place for developing simulations. One of the first titles to attempt to mimic a real sport was Ski by Allied Leisure. This one is completely obscure, but twenty years before Namco had Alpine Racer, players could pretend they were skiing by standing on the swivel footpads and coining the game up. Most developers wouldn't take that kind of risk through the 70's and 80's, until Japanese companies decided to embrace sports with a whole slew simulation grade titles in the 1990's. Many sports were given an upgrade from simple joystick controls, crossing the line into simulation; be it baseball, soccer, fishing, boxing, hang gliding, river rafting, skateboarding and more; sports like hockey, basketball and football would also get their own electromechanical games that are still plenty popular now. Konami would really pioneer in this area in the late 90's with their "MoCap" control technology, a predecessor to the type of controls that would later be popularized with the Nintendo Wii.

One last place to discuss Simulated Reality would be with "shooters", or gun-based games. This is another genre that existed prior to video games, with companies like Midway and Sega making a variety of shooting gallery style titles in the 50's and the 60's. Atari would be the first to bring something like that to
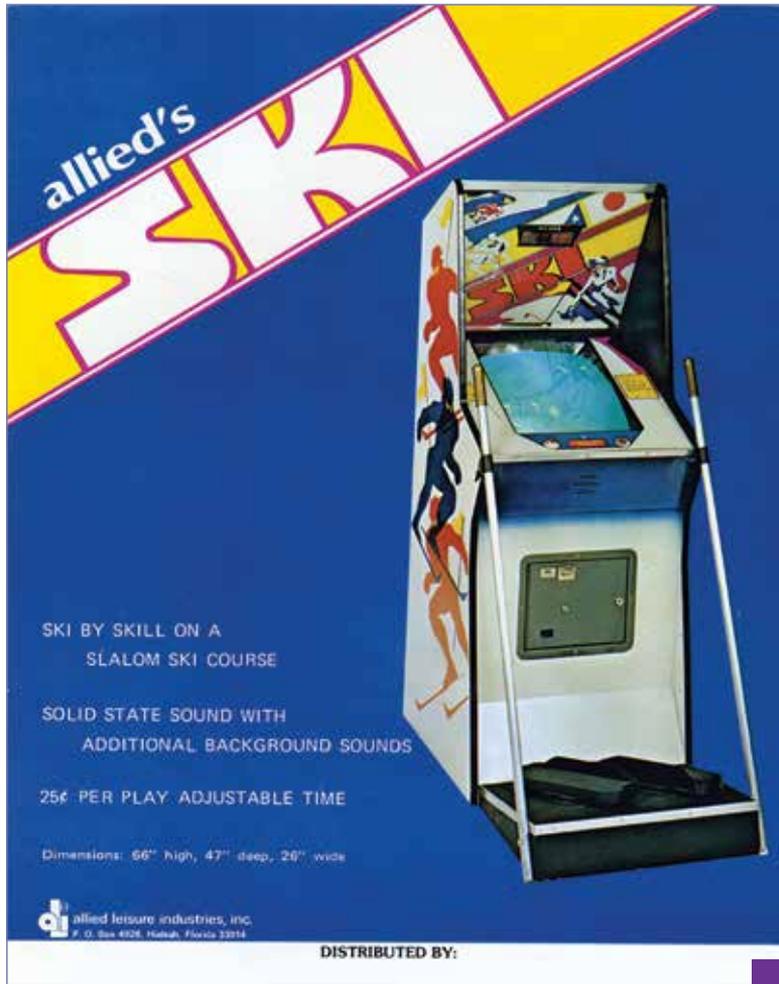
the arcade scene, starting with the duck hunting game QWAK! in 1974. It used an attached rifle that was about the size of a 12-gauge shotgun, with an IR sensor inside that would send the signal to the screen to replicate a shot. Oddly enough, such games were not really common through the "Golden Age" of gaming. You had the occasional mounted gun games hit the market, like Taito's Attack! Or Sega's Bullet Mark, but nothing that really made waves until the late 80's with titles like Taito's Operation Wolf. Mounted gun games would use a pair of potentiometers to dictate where the position of the gun was on the screen and would also be a little nicer for arcade operators to grab, since the guns couldn't be dropped on the ground.

The 90's would be the time when gun games would really come to form, offering elaborate scenarios from blasting aliens in Atari's Area 51; clowns in Midway's CarnEvil; criminal's in Konami's Lethal Enforcers and Sega's Virtua Cop; dinosaur's in Sega's Jurassic Park games; terrorists in Namco's Time Crisis; zombies in Sega's The House of the Dead or you could just put your skills to the test in shooting galleries with games like Point Blank. Either way, there were plenty of games that would allow players to put their marksmanship skills to the test and have fun while doing it.

The ability of arcades to simulate another part of reality is one of the reasons that I love them. There are so many experiences that are deepened, and innovations chased after, thanks to the hardware angle that developers needed to consider, allowing for exciting game possibilities. If you were to attempt to play pretty much any of the games mentioned in this article, as a home port or in emulation, you will notice how awkward it is to try and play – if not downright unplayable. So here's to the simulator arcade machines of the past – as well as those of the present and the future. Go out and play! EG

Adam Pratt - Owner and operator of the Arcade Heroes news blog and of the Game Grid Arcade (West Valley City, UT) that opened in 2008. He began collecting arcades in 2000 and has done everything in the business; from game sales to writing game reviews, marketing, QA testing, and consultancy, to name a few. He released his first book, The Arcade Experience, in 2013. Adam lives in the Greater Salt Lake City area with his wife and three kids.

Dan Kitchen: 2600 to Modern and Back

By Old School Gamer

Old School Gamer staff members have had the privilege of meeting many programmers from the heyday of the 1970s and 1980s, notably, David Crane, Garry Kitchen and Dan Kitchen, all of whom were influential during the Atari 2600 Generation and also the founding of Activision.

While at the Portland Retro Gaming Expo, we got to spend some time with Dan Kitchen to find out about his gaming history and how he has taken a game he started back in 1983 to finishing development on it now, in 2019.

Dan Kitchen is one of the original Activision developers and is one of the few that still actively programs. He developed classic games such as Crackpots, Ghostbusters, Crossbow, Double Dragon, Kung-Fu Master, along with F-14 Tomcat for the Atari 2600. As discussed elsewhere in this issue, F-14 Tomcat went on to make many other appearances on later consoles. It was then that he was able to capitalize on the additional power and memory beyond the Atari 2600's 1.19 MHz, 128 bytes of RAM and up to 4kB of ROM (64kB with bank switch), and finally make the games that he had envisioned.

Dan told us that with the resurgence of retro gaming that it would be fun to go back to his roots and design new Atari 2600 games.

Keystone Kannonball, 1983

"There were a few 2600 games I worked on while I was at Activision which never made it out of the lab for various reasons. One of the games was a sequel to my brother Garry's hit title, Keystone Kapers. Being a fan of railroading, I always wanted to create a game based on an old fashioned stream train and thought that would be a nice place for Keystone Kelly's next adventure. I started writing code for a display with railroad cars, added Keystone Kelly on top of them and called the game Keystone Kannonball. Around the time I began designing the initial game play, the Video Game Crash of 1983 was in full swing and Activision started pulling us off the VCS and onto the C64. So, I made a ROM of my work, took it home and lost track of it as the years passed.

"April of last year I began playing around with the various tools that are now available for Atari 2600 development and started rewriting Keystone Kannonball from scratch based upon my memory of the game. After a few months I had a display up with boxcars and a new character running across them. Then, sometime in June, I was cleaning out my offsite storage facility and found the Keystone Kannonball cartridge I had made in 1983! The cartridge display was almost identical to my new version, which in fact was actually better than the original."

After donating the original Keystone Kannonball ROM cartridge to the National Videogame Museum Dan decided to complete the game and release it as DAN KITCHEN'S GOLD RUSH in 2019.

"I initially started rewriting Keystone Kannonball for myself, but after video of the original game was posted online and articles about the game's 35-year journey began appearing on retro gaming sites, I realized there was still interest in 2600 games. So, I decided to complete the game and intend to follow it up with a few more new titles this year.

"Many people I know play retro games because it takes them back to their youth and connects them to a time that resonates with great memories. To me, the days I spent at Activision writing 2600 games were some of the best in my life. Designing new games for the 2600 helps me connect with those exciting days."

We asked Dan what advice he would give to someone who wants to develop for some of these older systems.

"For anyone who wants to craft new games on any of these older systems, I would suggest they read everything they can find online about the machine's architecture. They should also read the forums where other developers meet and exchange ideas. A lot can be learned by reading code examples posted by other developers. Also, search online for all the available tools. I was delighted to see that many tools are now available to assist 2600 developers. In the old days, we had to create all our own tools, from real-time debuggers to pixel editors. The tools of today definitely make some of the development easier.

Dan often encounters programmers who have a game concept they think will be fantastic. We asked him what questions they need to ask themselves in order to take their ideas to the next level.

"After they describe the theme of the game, which usually takes no more than a few words, I always say to them, "Great. Now, what's the game POV (visual perspective)? What's on the screen in terms of the player and NPC objects? How do you see the game play working?

"My advice is once you have a good idea, think it through. Play other games that are similar to learn what they did right or what they could have done better. Take the time to design every aspect of your idea from the game environments to the main character, enemies, pickups, to the actual game mechanics. When working on a game concept, I always take time to play it through in my mind to imagine what the player will see and experience. Any work done during this design period will save you hours, even days of work, when you finally get started creating the game."

To keep up on Dan Kitchen's "Kapers" check out DanKitchenGames.Com and look for more in Old School Gamer later this year.

DR. MARIO™

Dr. Mario and Packie

COINS DETECTED IN POCKET

By Steve DeLuca

Welcome to another installment of a column dedicated exclusively to Old School Gamers and Old School Games from the Golden Age of gaming. These gamers, back in the day, had to physically use a coin or token to start a video game. The earning of these coins was mostly accomplished after some form of work, usually the hard or difficult variety. After earnings were paid to the gamer, there was the trip to the ARCADE. ARCADE is written in ALL CAPS because it is the Old School Gamer's origin and sanctuary. It was, and shall always be remembered, as a hallowed place. Respect your origins.

Mobile gaming hardly ever shows up on my radar. Perhaps it's because my toilet time entertainment is too old school, reading a book or playing Game Boy Tetris. Mostly it's because I just don't dig mobile games. I totally dislike the feel of screen tapping, sliding, and tilting as a way to control the game. I need a controller or joystick, a control deck with real buttons that'll make you bleed after hours of playing.

On Jan 31 the internet showed signs of a fever when Nintendo of America tweeted:

The doctor is in! Mario puts on the white coat once again in the mobile game Dr. Mario World, targeting an early summer 2019 global release. @NintendoAmerica

Is the world ready for another dose of Dr. Mario? Without a doubt!

THE GAME

Released in 1990 during the later years of the Nintendo Entertainment System (NES), Dr. Mario dropped with a boom! An action falling puzzle game, Dr. Mario was produced by Gunpei Yokoi best known for his contribution in the creation of the Game Boy, designed by Takahiro Harada, with composor Hirokazu Tanaka who is credited with the Metroid, EarthBound and NES Tetris soundtracks. Getting in on the explosive success of Tetris, Nintendo released Dr. Mario on the NES and the GameBoy, as well as in a .Vs ARCADE format.

The feel of the game was spot on with Tetris. The falling pills moved and rotated exactly as expected. However, the puzzle dynamic was changed up a big way by shifting the players focus away from scoring points by clearing lines onto killing string dancing viruses with color coordinated vitamins. Dr. Mario also featured a sliding scale player vs. player mode, allowing two unbalanced players to set a handicap, making for an exciting head to head the whole family could enjoy.

With the popularity of the Classic Tetris World Championship and the outbreak of retro conventions and expos, Dr. Mario tournaments have been popping up all over.

THE PLAYER

A stone-faced devastator, Patrick "Packie" Haendle, is the vitamin dropping master who is known for freezing the system with his insane Dr. Mario combos. A San Diego area resident, Packie has traveled all over the United States, winning ever Dr. Mario competition he can get to. I got the chance to meet up with Packie at the 2019 Retro City Festival where he was competing in both the Classic Tetris World Championship - West Coast Qualifier and in the first ever NWC Reunion tournament.

Packie's first engagement into the world of retro eSports is when he decided to travel the 2 hours north to Los Angeles, giving his skills a test run at the 2015 Nintendo World Championships Los

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Steve DeLuca - Best known as the madman and creator of the NES Goofy Foot controller. A father, drummer, electronic engineer and a right-handed old school gamer, Steve still finds time to run his website TotalRadNES.com and recently kicked off a nonprofit called Radically Achieving Dreams (501 (c)(3)). Also a big part of the Classic Tetris World Championship (theCTWC.com), Steve hosts the CTWC Qualifiers held at Retro City Festival (Los Angeles), Let's Play Gaming Expo (Dallas), and at Game On Expo (Phoenix). He can be heard commentating tournament matches from time to time at twitch.tv/classictetris. A huge fan of horror and classic gore Steve has worked his way into several indie movies and music videos, once getting to rip open the chest of the famous Vernon Wells. Favorite console and game: Nintendo Entertainment System - #1 is the NES Tetris with Dragon Warrior as a close #2. Favorite Arcade: Donkey Kong 3 with a high score of 363,000 (and climbing).

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DR. MARIO

Angeles Qualifier. Throwing down a 5.4 million on NES Remix his first attempt, Packie locked in his seat on that plane to New York City. Little did he know, Packie had knocked out his soon to be Dr Mario arch nemesis Vince Clemente, founder of the Classic Tetris World Championship (CTWC), who had dropped a 5 million prior. Packie's bout at the 2015 NWC didn't go over as well as his debut, but by playing on the stage we all dream about, he caught the bug of retro competition.

After the NWC, Packie just searched around randomly until coming across an NES Remix Championship Mode tournament at Retropalooza (Arlington, TX). It was perfect, not only would he be able to dominate the competition but his cousin lives in the Dallas area making it a two for one deal. Now an unstoppable force, he laid down a 5.9 million qualifying score following through with the win of the NES Remix tournament along with 3 other tournaments that same weekend: a Super Mario Bros world 1 speedrun competition, a Donkey Kong Gaunlet (DK, DK Jr., and DK3), and a fierce Mario Kart Double Dash vs. mode tournament that ended in a photo finish.

This guy is such a serious Dr. Mario player, he has tried training with a black and white TV to increase the difficulty. There's no surprise when you hear he's won the 2 Replay FX Dr. Mario Tournaments (2017 and 2018), one held at Retropolooza (2018), and finally the toughest of all at the 2018 CTWC Dr. Maro side event.

Now regularly streaming on Twitch as Packie619, you'll likely find him gunning for a world record speed run or sharing a few of his training tips and game play secrets. Before we parted, I got him to share a few of them with us. Game on:

PACKIE: far as versus is concerned, it's all about speed and doubles. You need to be quick and decisive. It's a far more forgiving game than Tetris; you have a lot more room for error.

The time you have the least room for error is early on when you're closest to the top of your board, so a lot of games can be won and lost early on if you have a combo spammer.

Also avoid overhangs whenever possible. The less time your pill pieces have to fall, the better.

For one-player mode...if you're going to go for high scores, you have to master the art of combos. It's a completely different way to play Dr. Mario

When you're in vs mode, you have to be fast and get quick, short combos. When you're doing score runs, you have to let the game come to you. Your combo setups need to start low and work their way up.

Generally you set up a trigger point, like a bridge you're going to cut down, and set up your combo on top of the bridge. Cut the cord, watch it fall, and rack up the points.

NES Dr. Mario will actually start glitching up if your combo is big enough. If you mash buttons on controller 1 or 2, eventually it'll unfreeze.

@Packie619   https://www.twitch.tv/packie619

*Special note: It is truly an honor to take over where Joel West has left off. One hell of a baton to be passed; now a legacy, this column showcases amazing games and the gladiators that have mastered them. I'll give it all I've got to keep it up to Joel's standards, getting the best of the best to share the secrets of their wisdom.

Flyer provided by Arcade-Museum.Com

Dr. MARIO™

1 PLAYER GAME
2 PLAYER GAME
© 1990 Nintendo

1P   2P
LEVEL
08 06
MED MED
VIRUS
05 05

TOP
0010000
SCORE
0002200
Dr.MARIO
GAME OVER
LEVEL 09
SPEED MED
VIRUS 31
START

Seal of Quality
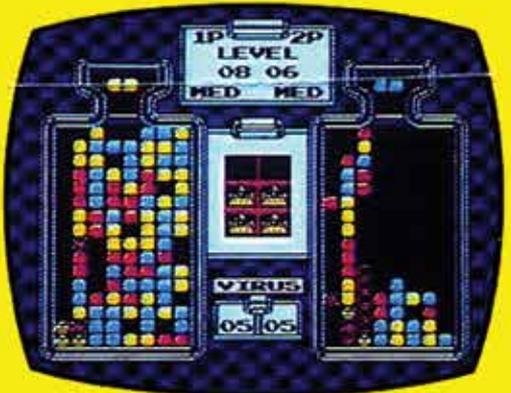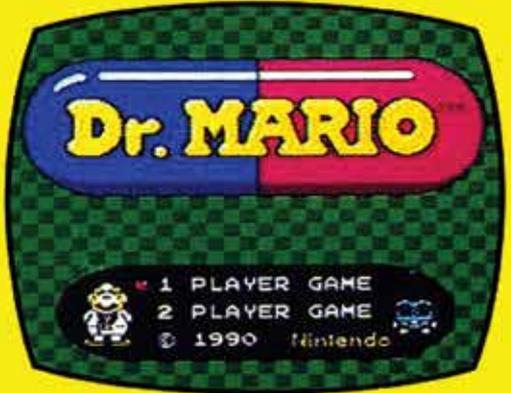
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Buying With The Captain!

CAPTAINS AUCTION WAREHOUSE - ANAHEIM, CA

By Ryan Burger

Having only seen one arcade auction in Iowa (after 30 auctions over the last 15-20 years), I didn't know what to expect when I walked into the Captains Auction Warehouse in Anaheim, California. I had met the "Captain" Chris Campbell, and several of his staff (thanks to friend in common Walter Day), at the Retro City Festival in Pomona a couple weeks earlier and interviewed him for this article.

The Captain and I sat down for nearly an hour, starting out talking about his life as a gamer. He went through being a gamer in the era of small dingy arcades, and arcade cabinets being everywhere, including such places as 7-11 gas stations. We then talked about how he took some time off from gaming, played in some bands, and years later started to settle down and play even more games.

CAPTAIN: When Sega Genesis came out, got that, 3DO came out, which was, I think the first disk playing home console unit. So I always stayed up with that and I think I always had enough money. I've always been able to hustle. I haven't had to really scrape. If I wanted to get something, I could buy it. It's no problem, because I always hustle – seeing value in everything that I come across, which allows me to buy and sell and do all of that.

I would say probably moving up to 1996-1997, I had done a

series of jobs, working, and I'd been playing with eBay for about a year or two. I had to develop -- eBay was pretty stock back then. It was a lot to open a bunch of screens, because that was the era of dial up. And I really got into what I do now just by touching the iceberg of eBay. Buying a game and then reselling the game - I think I made ten times my money back.

It was important for me in molding my business that particular purchases went to a particular person -- the sale went to a person out of state, okay, this was eBay. And at the time, anybody who was involved in coin-op who was selling and buying on eBay, and you had large items, you had to track that item yourself to a location. You had to get it scaled and measured, and this tracking company would say, 'Okay, now take it home, put a wooden crate on it, bring it back, and then we'll ship it for you.' And this is what people were doing for quite a while. During that time in between, when I really wasn't doing anything with games, I worked for a series of companies. I was a warehouse guy, shipping and receiving, and then management. When I said this, I asked other people, 'You guys are doing this every day?' And they're like, 'Yeah. It's a pain in the.....'"

The Captain was working this out of the back of his day job, and eventually he had approximately 45 games palletized, banded, and ready to go in the back warehouse. The boss said, "This is taking a lot of space, so maybe you need to consider looking

for another spot." The time had come for Captain Chris to turn into Captain's Auction Warehouse! During some of that time, he switched between locations. In 2008, he moved into the facility that Old School Gamer was able to check out in Anaheim. The Captain then went on to hiring the auctioneers that later became famous for Storage Wars, went through a couple bumps, and eventually the Captain became the auctioneer.

CAPTAIN: I just grabbed the mic, 11:00 and I just introduced myself and from there, it was on. I just started auctioning. And at the end of the auction, I wasn't sure how it was going. I mean, I just did my thing and I mean, I went through and I was grinding and just grinding on people, doing all that and I was selling the equipment. I mean, I was selling you on it, because I knew the games. I know all this stuff.

And over 10 years later he still rolling. We asked the Captain what they should expect when attending one of his auctions:

CAPTAIN: You can expect to be greeted by one of my staff with a smile, asking if you need anything -- any help with anything. They could expect to see a lot of clean arcade and pinball machines from the classic, golden era. I mean, I've got '60s, '70s, '80s and '90s - clean reconditioned games and pins. So they're going to see that. They can expect, if they can walk up and test any of the machines that are there, to have great service all the way through, from beginning to end.

How about any advice on what to look for when buying a game either at a Captains Auction or elsewhere?

CAPTAIN: Well, for starters, if they're

looking for an arcade game, test all the buttons and joysticks. Check the inside, the door for coin mix. I mean everything I do is pretty much coin operated. So you just check the basic interior to make sure it's mechanically sound, and need not worry if the joysticks or buttons are stuck. They can be unstuck, it's not a problem, but check all of your functionality. And then a good picture... you want to check for a good picture. Inspect the machine all you want.

That's what they should really look for, and if you're a novice, look at the monitor...look at the buttons, the joysticks. If it's a pinball machine, look at the flippers and look at the playfield. I put them both in the same category. I really love this Retro City Festival because I putting everything together. There's a lot of factions out there. You've got retro gamers that are into home consoles and then you got arcade

Please note there is a delay between Twitch and Live Auction bidding. If you would like to place a bid, please go to captainsauctionwarehouse.com
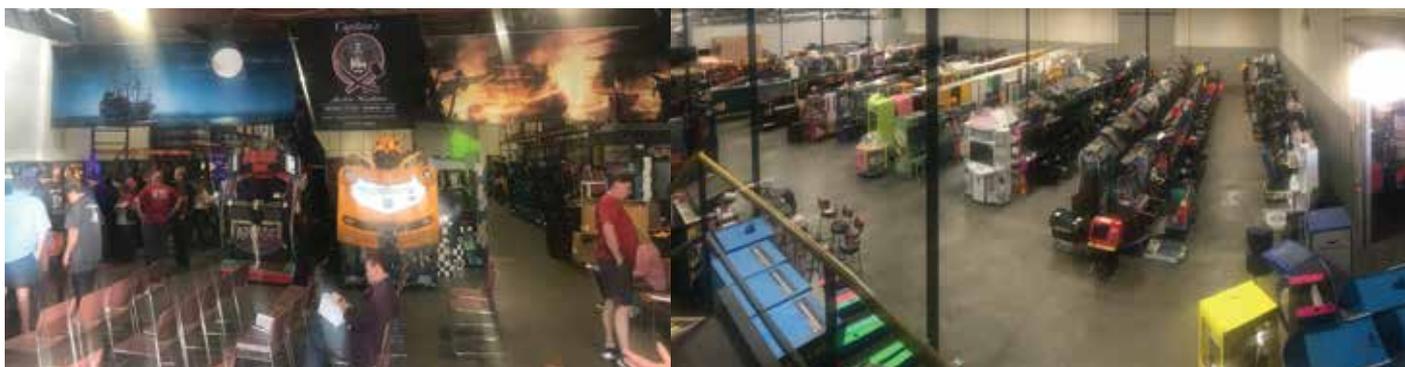
people into coin-op, and then you got pinball. And believe it or not, the arcade and the pinball don't always get along, but I try to put those together.

Right after this interview concluded, I decided to extend my next business trip to Southern California by an extra day so I could see this legendary auction in action later in the month. After thoroughly enjoying the conversation with the Captain, I knew I had to be there. About 15 minutes from Disneyland, in an industrial

park (still in Anaheim), Captains Auction Warehouse lives in several warehouses that get loaded up, auctioned and shipped out over 5-6 week periods, 10 times a year.

The selection this time was nearly 600 games (plus nearly 100 redemption and vending the day before) from some of the latest gun shooters, massive games from Dave and Busters to pinball machines from the 1950s, and of course arcade games that I was interested in from the 80s, 90s and 00s. They are well organized and they researched every game, they are all indexed on his site with their own picture, description and more. The great thing about having a static location, unlike most of the auctions I have attended or heard about, is that the product is able to be brought in and looked over without having the craziness of selling it a day or two later.

Consignors work with the Captains Mateys (my name for them not his), in the weeks preceding the auction, often take out their purchases from the previous auction at the same time. The games are organized into the higher end stuff in one warehouse and the "need some care" games in the second warehouse to be auctioned off after the main room. In my time there, I was able to see most of the main room of around 200 games get auctioned off, and the other 400 extended into the evening wrapping up around 3am. I know that because I was checking out a rare Karate Champ cocktail table that was near the end of the line when I landed at one of my connecting airports on the way home.

While there were only around 100 people there in person, I understand there were over 250 people internet

bidding. Captains Auction Warehouse has a fantastic method for blending onsite bidders with online bidders, plus bringing in phoned in bids and more. You need to see it to understand fully, but just to say it's smooth and respects everyone nicely. The auctioning and bidding all comes back and runs from the front of the one warehouse and he moves through games about every 3-4 minutes. Everything is streamed live on Twitch.TV stream (twitch.tv/captainsauction), and also fed through their auction site (bid.captainsauctionwarehouse.com) where you can see what item they are on, see the Twitch stream and bid on items live.

The Captain handles all of the auction duties himself with another person handling the online bidding, and a 3rd upfront with him recording and tracking everything. The great thing about the Captain is that he grew up in this industry and really knows the product and will tell you what he knows or has researched in the time between auctions.

Once it gets past the actual sale, his crew steps in with financial settlements, moving games, and shipping them out. While a ton of the bidders are in SoCal and will come and pick-up games, many others are arcades and collectors from outside the area and that's when the crew really steps in and flexes their logistic muscles.

So if you are from Southern California or can find an excuse to be in the area when the Captain is auctioning, you will find it an amazing experience and a blast to be part of. 🎮

CaptainsAuctionWarehouse.Com

Game Swappers of SoCal!

By Marc Burger

Game Swappers is a store in Montclair, California, a part of SoCal that is known as Inland Empire. William Gonzalez and his crew run the shop in addition to making their way to just about every west coast gamer convention they can get to. They effectively pack up almost their entire store, re-set it at the convention, and spend the weekend making deals with collectors and gamers at each of those events. I have personally seen them at the Portland Retro Gaming Expo and the Retro City Festival in Pomona, California, not far from their store. Their store is super fancy, but that's not a bad thing! These guys, especially William, know their products and are gamers themselves. It shows in their style and attitude. Every time I see them I know that these people with which I want to do more business.

William grew up in the age of the later Atari consoles along with the start of Nintendo taking over the market in the early 1980s. He tells me about how his mom, back in the day, bought all his games for him (most of the games we grew up with). And then about 5-6 years ago, he started to get the bug.

WILLIAM: So I started selling stuff through Craigslist. I would buy collections, selling stuff through there. Oh, actually, funny story how I actually started selling video games again was I traded a pair of golf clubs for a videogame collection.

So I just started buying more games, buying more games and basically, it just became a business; you know? And then I started just working and buying video games when I was working. Basically, I used to be a tow truck driver. So I would go to L.A., I'd be on my phone on Craigslist, look for stuff, I would go to Hemet....

And then I ended up walking here one day and this is when Grand Theft Auto was really popular. I ended up coming to the owner of the building, because there was a big sign that said (which is still there), "we buy video games". You know, buy, trade, sell -- you know, sell or trade. She was low balling me on some games and I kind of had to school her. Then she responded, "why don't you open a store here...I'm not using it." That's how it came about.

Things started growing from there, buying mega lots, finding high value games, selling them on ebay, supplying other stores across the country and around the world.

WILLIAM: We supply a store in Canada, we supply three stores in Dubai, we have a store in Virginia, we have a lot of people here in this area that come and buy from us and they resell it for more.

But William and the Game Swappers wanted more opportunities to buy and sell games, so they quickly expanded into running a monthly event. He noticed that near the end of the month, people didn't have a lot of money, so at that point they might decide to sell their older games or trade. He then created this event in the store that was all about trading games; people would bring in their stuff without the worry of spending money, as it was, as he says, "all about meeting new people and doing trades." It started moving from 10-20 to 30 collectors coming in, moving games they didn't want any more, or were just duplicates. All of this was organized by Game Swappers. From there it has just exploded.

WILLIAM: Well, at our events, we let a lot of things slide. We do a lot of prototype stuff. We've done autographs, we've done rare toys, we've done mystery bundles, we've done -- I mean, it's just weird things. We've done from the basic, common Smash Brothers Melee to prototypes that you don't see every day or hand paintings, stuff like that. Much like this one, we had a pair of PlayStation Grand Turismo Nike tennis shoes!

Track down Game Swappers at https://www.facebook.com/gameswappers/ or on Instagram @GameSwappers or if you are in the Inland empire part of SoCal look them up and stop by! 🎮

Frank Schwartraubner

IOWA RPG COLLECTOR

By Aaron Burger

Old School Gamer had the pleasure of meeting Frank Schwartztrauber at a recent arcade game auction in Central Iowa. It's fun to meet Iowans that appreciate video games as much as we do and have the collecting bug. Most of the time it takes the Internet and Facebook to bring people together that live 10-15 minutes away from each other, even when they have similar interests. And that's the case this time with Frank, who lives in Des Moines and has an amazing collection of consoles and games that has taken over his house, just miles away from our Grimes offices.

FRANK: I just remember going over to a friend's house when I was a kid and seeing pong being played on TV. I played it and got hooked. But my favorite game on there was Breakout. I would go over to this kid's house whenever I could just play Breakout.

As the original Nintendo and Super Nintendo started to fade away, he kept looking at his collection and seeing those boxes complete with everything in them for several Final Fantasy games and Legend of Zelda games.

FRANK: Every once in a while I would open up the box and pull out all the stuff that came in it just to see it again. I had several RPGs (Role Playing Games) for the Nintendo and Super Nintendo all in original boxes complete. So I thought I would try to find some other RPGs that I did not have on eBay. Then as I found a few and started sticking them on my shelf all together, it just gradually progressed into wanting every RPG for Nintendo and Super Nintendo complete in the box. It just took off from there.

Then I started trying to find all the consoles I could in the original box. The first one I looked for was the ColecoVision. That was my first system that had died many, many years ago."

His specialty, without a doubt, is RPGs. I guess I never realized how many RPGs were coming out for the consoles at that time. Personally, I was playing them on my Apple IIc computer, but he was playing them on both the Apple and home consoles.

FRANK: I have a lot of large collector edition RPGs for almost every system. I also have a very large (a few hundred) collector edition and regular RPG strategy guides. I also have several hundred video game magazines starting from over 30 years ago. I just really enjoy my entire collection. But I guess when I pull out that gold cartridge of Legend of Zelda in the original box, it really brings back a lot of memories for me, because that was the first RPG I played. I went from there to Final Fantasy.

I guess my Holy Grail would be to find a copy of Akalabeth. One of the originals that Richard Garriott / Lord British made and took them to local electronic stores in a Ziploc bag and pin them to the wall and sell them. I would love to get my hand on one of those.

His tips for playing on these Old School RPGs: "....just level, level, level. Persistence and experimentation to find the right way to tackle bosses on the newer ones. And just do a lot of exploring. Most gamers stay away from guides but, sometimes you miss out on items, areas, characters, etc., that you may never have come across without. I'm a "completionist". I like to finish - find and do everything in a good RPG.

FRANK COLLECTING

Favorite system- SNES, Favorite arcade games - Crazy Climber, Ms PAC-Man, First home game played – Pong/Breakout, First system owned – ColecoVision

50+ consoles, 30+ handhelds
20+ plug n plays.
Over 800 guides and gaming related books, Over 1300 RPGs including imports, packaging variations, collectors editions etc
2589 games total.
1500 gaming magazines

Video Games Debut at Heritage Auctions

By Brett Weiss

I t had to happen…Retro video game collecting has been mainstream for well over a decade, with prices for desirable games skyrocketing exponentially, and Dallas-based Heritage Auctions, one of the biggest auction houses in the world, is finally getting in on the action.

"The key to making it happen was Wata Games," said Heritage Vice President Barry Sandoval, referring to the video game grading service. "We toyed a little bit with the idea of selling video games, but what sold us is that one of Wata's principals, Mark Haspel, used to be with CGC. That he was involved made us take it seriously. CGC has graded somewhere between three and five million comic books. That's a good model to follow."

Heritage dipped its toes in the vintage video game waters by offering 25 boxed games—some of them factory sealed—at its Jan. 13 Sunday Internet Comics, Animation, & Art Auction. More than 30 collectors bid on a factory sealed 9.4 B+ (Seal Rating) copy of The Legend of Zelda (1987), a groundbreaking action role-playing game for the Nintendo Entertainment System. The NES, which debuted in the U.S. in 1985, revived the console industry after the Great Video Game Crash of 1983. Zelda was the top video game lot in the auction.

"We thought Zelda would sell for a few hundred dollars," Sandoval said. "It went for $3,360."

To get an idea of the value of specific games, Sandoval said Heritage "checks out eBay and other websites," but they "don't put estimates on these types of auctions."

"It's up to the bidders to determine the worth," he said.

Sandoval said he is a "former collector" whose interest is in Atari, but he explained that Atari is a "smaller niche" and that the Nintendo Entertainment System is the go-to console for "big money."

The NES was indeed well represented at the auction, with high prices commanded for such popular titles as:

- Teenage Mutant Ninja Turtles (1989, 8.5 CIB), $312
- Super Mario Bros. (1985, 8.0 CIB), $312
- Wario's Woods (1994, 9.4 A+ Seal Rating), $228
- Mega Man 5 (1992, 6.0 CIB), $216
- Super Mario Bros. 3 (1990, 6.5 CIB), $210.

Nearly two dozen bidders competed for a factory sealed (8.5 A Seal Rating) copy of Excitebike, a motorcycle racing game that was an NES launch title, meaning it debuted with the console in 1985. It went for $1,140. The game was designed by Shigeru Miyamoto, known best for creating such iconic Nintendo titles like as Donkey Kong, Super Mario Bros., and Starfox.

Another top earner was Dragon Warrior (1989), the first game in the long-running Dragon Quest role-playing game series.

Seventeen bidders drove the price of an 8.5 A (Seal Rating) example to $660. As a promotional tool, Nintendo of America had offered the game free to new and renewing subscribers to the company's Nintendo Power magazine.

The highest price realized for a game released for a console other than the NES was Double Dragon (1988) for the Sega Master System, which was the closest thing the NES had to a serious competitor during the late 1980s. A 9.6 CIB copy went for $204. The auction also included some loose (cartridge only) Super Nintendo games. The Super Nintendo Entertainment System (SNES), released in 1991, was the follow-up console to the NES.

Sandoval sees correlations between video games and comics. A relatively modern type of collectible (the first video game console was the original Magnavox Odyssey, released in 1972), video games evoke comic books in several ways. Both are colorful and cartoonish, both are meant to be used (as opposed to merely looked at), and the fan demographic is similar.

However, there's one key difference in terms of collectability. Unlike the vast majority of comic books released during the late '80s and early '90s, which are worth practically nothing, a fairly high percentage of video games from this time are quite valuable, especially complete in the box.

Sandoval said that is because "comic books from that era were preserved in large numbers," thanks in large part to the speculator boom in which people were hoarding comic books in hopes that they could one day sell them in order to send their kids to college. Video games, on the other hand, were often thrown out or sold for pennies on the dollar at garage sales and flea markets once the next big gaming console would come along. And few people kept the boxes and manuals, a consideration not relevant to comics.

Sandoval said Wata will at present only grade games from the Nintendo NES and forward, meaning they don't deal with video games released for such relics as the Atari 2600, Intellivision, and ColecoVision. Currently, they are primarily interested in systems produced by Nintendo and Sega. Sandoval hopes this will change at some point in order to "round things out."

According to Sandoval, Heritage's strategy going into video game sales is to start off slowly with internet auctions, get bidders used to the idea, and then come in later with the more expensive stuff for their signature auctions with live auctioneers and bidders.

"This will give people results to look at to lend the idea more credibility," he said.

Sandoval called the Jan. 13 auction "just the tip of the iceberg" when it comes to video game sales.

"We're going to auction more every week, and we have some real rarities on tap for our large February Signature Auction," he said. "For example, we have a 'not for resale version' of Halo for the Xbox that may go for as much as $10,000."

New Books on Old School Gaming Topics

BIBLE ADVENTURES / THE GAME CONSOLE

By Ryan Burger

We at Old School Gamer love a good book about video games, just like how we love putting out Old School Gamer for you! In this issue we have two new books to talk about that we have enjoyed over the last couple of months: one while traveling to cons as is the case with *Bible Adventures* from Boss Fight Books. And in the case of *The Game Console: A Photographic History from Atari to X-Box*, written and photographed by Evan Amos, while sitting on the couch as snow took over Iowa for a few days in January.

BIBLE ADVENTURES – BY GABE DURHAM

Boss Fight Books published this book by Gabe Durham in 2015, and similar to its other video game related books its a small format paperback that is perfect for carrying with you when travelling or having handy in the car. Bible Adventures is the story of Nintendo making sure it didn't go the way of Atari game releases and the video game crash of 1983 by keeping quality in place through control of the market. It's also the story of companies like Tengen (Atari Related), Wisdom Tree (the publisher of Bible Adventures) and others working away around the 10NES chip that allowed Nintendo to maintain such control. These are the adventures of the 3rd Party Publisher.

A cool story that I won't ruin here for you but one I've wondered more about ever since I heard parts of it over the last 10 years. Absolutely a great read for the retro gamer.
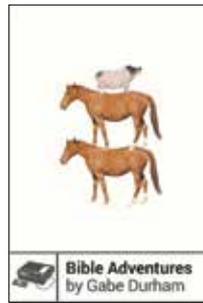
Bossfightbooks.com

THE GAME CONSOLE: A PHOTOGRAPHIC HISTORY FROM ATARI TO XBOX - BY EVAN AMOS

What started out as a project to improve Wikipedia's imagery for home video game systems exploded into this fantastic hardback full color book taking apart video game systems going back from the 1970s to the Current. Although it's titled "to XBox" it goes further covering newer stuff such as the XBox One, Nintendo Switch and other late 201X consoles most people might not know of.

The part that I love about this book is that he literally took apart the consoles and show what's inside often in an "exploded" view that allows you to see wiring, the motherboard, switches, mounts and more. But the book isn't just pictures, he details out the processors, RAM, colors, and give a nicely researched description of the consoles, and often details on the controllers and other accessories. He does also list another couple dozen excluded systems that he wasn't able to get in here with but wanted to see that they were noted. Personally I would love a book covering those also....we will see.
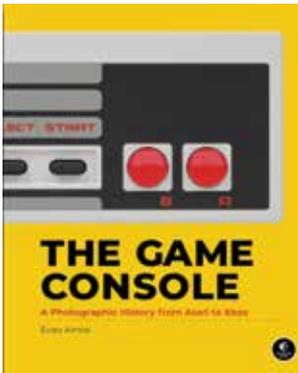
Amazon.com / NoStarch.com

Driver and Driver 2

but sometimes the timer is reset if the mission requires you to complete multiple objectives.

As your felony meter increases, police cars become faster to make outrunning them more difficult. They'll even set up roadblocks to slow you down. Their goal is to ram into you in order to wreck your car. You can do the same to police cars in order to stop them, so Driver has "combat," if you can imagine two sedans trying to fight each other.

Driver 2 tried to mix this formula up a little bit. In that game, Tanner could get out of his car and run around on foot. Even for its time, this was a clunky mechanic.

Tanner controls like a tank mounted on a pottery wheel. Somehow the vehicles are smoother to control than the person driving them, though this was probably something the programmers couldn't help, as the game's engine was likely more accommodating for vehicles.

In addition to its PlayStation release, the original Driver was also released for PC and Mac, while a companion title was made for the Game Boy Color under the same name. In 2009, an updated version of Driver came out on iOS devices. Sadly, this version of the game is no longer available.

Driver 2 did not get a PC release, but another version of the game came out on the Game Boy Advance. This version imitates the playstyle of its console counterpart but uses sprites for vehicles instead of polygon models, which makes it feel like old SNES racing games like Super Mario Kart or F-Zero.

Sadly, Driver and Driver 2 have not received official, digital releases anywhere; not even on the PlayStation Store. If you want to play the original versions of these games, you'll have to order them from somewhere or find copies at a store that sells retro games in your area.

Newer games in the Driver series are accessible, which makes the unavailability of the first two games in the franchise all the more baffling. Hopefully Ubisoft, the company that now owns the Driver intellectual property fixes this in the future.

Super Nintendo Pricer

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PriceCharting.com is your source for current and historic prices on over 26,000 video games, consoles & accessories. You can view daily updated prices on almost any video game released on a major console from the original Nintendo to Xbox 360. We update our prices daily from sources across the internet so you can be sure the data is accurate and timely. Visit our methodology page to get more information about how we get the prices. Various issues of Old School Gamer Magazine will publish pricing for a different console or gaming era.

Game	Loose	Complete
3 Ninjas Kick Back	$61.50	$749.38
A.S.P. Air Strike Patrol	$21.06	$48.44
AAAHH Real Monsters	$7.05	$24.99
ABC Monday Night Football	$4.04	$11.04
ACME Animation Factory	$6.19	$27.58
ActRaiser	$27.20	$53.00
ActRaiser 2	$26.00	$60.00
Addams Family Pugsley's Scavenger	$10.00	$29.01
Addams Family Values	$12.63	$29.51
Adventures of Batman and Robin	$63.43	$205.53
Adventures of Dr Franken	$8.93	$29.99
Adventures of Mighty Max	$8.93	$24.92
Adventures of Yogi Bear	$10.90	$28.51
Aero Fighters	$599.99	$1497.89
Aero the Acro-Bat	$7.58	$26.02
Aero the Acro-Bat 2	$29.63	$84.09
Aerobiz	$22.23	$46.57
Aerobiz Supersonic	$36.23	$65.01
Air Cavalry	$18.76	$56.70
Al Unser Jr.'s Road To The Top	$4.95	$12.49
Aladdin	$15.41	$32.98
Alien 3	$13.73	$37.99
Alien vs Predator	$19.97	$64.39
American Gladiators	$5.99	$15.40
An American Tail Fievel Goes West	$69.37	$169.32
Andre Agassi Tennis	$7.86	$14.88
Animaniacs	$7.99	$24.82
Arcade's Greatest Hits Atari	$10.88	$23.30
Arcana	$19.89	$39.00
Ardy Light Foot	$104.95	$197.11
Arkanoid Doh It Again	$9.81	$15.23
Art of Fighting	$5.63	$14.73
Axelay	$40.12	$120.95
B.O.B.	$15.73	$36.38
Ballz 3D	$6.52	$10.90
Barbie Super Model	$5.86	$15.64
Barkley: Shut Up and Jam!	$5.95	$9.99
Bass Masters Classic	$5.00	$11.77
Bass Masters Classic Pro Edition	$7.74	$12.30
Bassin's Black Bass	$12.96	$22.47
Batman Forever	$5.72	$17.91
Batman Returns	$12.19	$40.04
Battle Blaze	$8.80	$23.76
Battle Cars	$10.29	$29.68
Battle Clash	$3.57	$9.40
Battle Grand Prix	$11.91	$26.03

Game	Loose	Complete
Battletoads In Battlemaniacs	$26.55	$73.35
Battletoads and Double Dragon	$22.85	$101.67
Bazooka Blitzkrieg	$18.23	$45.54
Beauty and the Beast	$29.62	$84.20
Beavis and Butthead	$9.99	$28.17
Bebe's Kids	$22.20	$82.36
Beethoven	$5.61	$17.61
Best ... Best Championship Karate	$6.60	$11.62
Big Sky Trooper	$18.99	$39.99
Biker Mice From Mars	$40.22	$202.50
Bill Laimbeer's Combat Basketball	$2.97	$12.71
Bill Walsh College Football	$4.66	$9.26
Biometal	$30.52	$89.99
BlaZeon	$20.63	$72.86
Blackthorne	$28.60	$64.66
Blues Brothers	$18.17	$43.82
Bonkers	$17.36	$38.06
Boogerman A Pick/Flick Adventure	$42.93	$159.50
Boxing Legends Of The Ring	$4.92	$12.76
Brain Lord	$24.71	$61.76
Bram Stoker's Dracula	$7.97	$19.60
Brandish	$48.58	$139.99
Brawl Brothers	$23.07	$60.00
BreakThru	$8.00	$23.99
Breath of Fire	$25.56	$79.99
Breath of Fire II	$49.50	$115.12
Brett Hull Hockey	$6.00	$6.58
Brett Hull Hockey '95	$2.78	$10.49
Bronkie The Bronchiasaurus	$142.38	$175.57
Brunswick World ... of Champions	$3.38	$7.37
Brutal Paws of Fury	$7.88	$23.26
Bubsy	$8.97	$22.47
Bubsy II	$10.71	$28.14
Bugs Bunny Rabbit Rampage	$7.48	$22.32
Bulls Vs Blazers ... NBA Playoffs	$3.67	$7.98
Burn-In/Test Cartridge	$35.00	UNK
Bust-A-Move	$17.98	$42.39
Cacoma Knight in Bizyland	$24.30	$53.00
Cal Ripken Jr. Baseball	$3.41	$7.61
California Games II	$9.16	$28.80
Cannondale Cup	$11.80	$36.66
Capcom's MVP Football	$4.92	$11.00
Capcom's Soccer Shootout	$15.02	$59.99
Captain America and the Avengers	$12.88	$47.05
Captain Commando	$86.95	$266.25
Captain Novolin	$39.38	$138.95

Game	Loose	Complete
Carrier Aces	$8.97	$21.21
Casper	$91.78	$422.39
Castlevania Dracula X	$184.96	$290.00
Champions World Class Soccer	$4.42	$10.48
Championship Pool	$4.72	$7.56
Championship Soccer '94	$7.10	$11.50
Chavez Boxing	$18.68	$39.59
Chavez Boxing II	$20.97	$68.95
Chessmaster	$4.38	$9.99
Chester Cheetah Too Cool to Fool	$12.10	$31.49
Chester Cheetah Wild Wild Quest	$14.99	$45.44
Choplifter 3	$22.78	$52.34
Chrono Trigger	$99.66	$237.24
Chuck Rock	$7.99	$24.91
Clay Fighter Tournament Edition	$11.62	$29.10
ClayFighter	$7.44	$20.46
ClayFighter 2 Judgment Clay	$10.00	$35.77
Claymates	$11.64	$30.43
Cleaning Kit	$10.21	$17.79
Cliffhanger	$5.30	$16.89
Clue	$5.49	$11.94
College Football 97	$7.45	$13.77
College Slam	$4.32	$8.54
Congo's Caper	$21.03	$54.56
Contra III The Alien Wars	$32.78	$86.79
Contra III The Alien Wars [NFR]	$116.03	UNK
Cool Spot	$10.41	$28.50
Cool World	$11.77	$38.07
Cutthroat Island	$7.52	$18.99
Cyber Spin	$4.84	$19.81
Cybernator	$20.86	$51.50
D-Force	$7.00	$20.99
Daffy Duck Marvin Missions	$8.12	$24.35
Darius Twin	$13.82	$40.22
David Crane's Amazing Tennis	$5.50	$13.45
Demolition Man	$9.25	$27.14
Demon's Crest	$88.98	$272.41
Dennis the Menace	$5.25	$14.68
Desert Strike Return to the Gulf	$5.93	$20.43
Dig and Spike Volleyball	$5.00	$13.35
Dino City	$10.00	$21.88
Dirt Trax FX	$8.25	$21.97
Donkey Kong Country	$17.94	$46.57
Donkey Kong Country 2	$15.95	$45.00
Donkey Kong Country 2 [PC]	$18.30	$60.13
Donkey Kong Country 3	$20.20	$52.47

Game	Loose	Complete
Donkey Kong Country 3 [NFR]	$55.83	UNK
Donkey Kong Country 3 [PC]	$25.00	$52.50
Donkey Kong Country Comp Edition	$1650.51	$1,710.43
Donkey Kong Country [NFR]	$96.44	UNK
Donkey Kong Country [PC]	$13.87	$40.47
Doom	$21.50	$57.97
Doom Troopers	$24.92	$96.46
Doomsday Warrior	$8.18	$20.32
Double Dragon V The Shadow Falls	$12.25	$34.99
Dragon The Bruce Lee Story	$9.22	$27.70
Dragon View	$85.00	$156.83
Dragon's Lair	$9.60	$24.99
Drakkhen	$7.80	$19.05
Dream TV	$11.91	$22.84
Dungeon Master	$14.99	$40.55
Dungeons & Dragons Eye Beholder	$9.38	$19.52
ESPN Baseball Tonight	$4.18	$10.78
ESPN National Hockey Night	$4.71	$11.62
ESPN Speed World	$6.65	$18.20
ESPN Sunday Night NFL	$4.52	$9.99
EVO the Search for Eden	$171.57	$448.45
Earth Defense Force	$12.86	$31.00
EarthBound	$177.95	$626.54
Earthworm Jim	$22.24	$52.08
Earthworm Jim 2	$17.48	$53.36
Eek The Cat	$12.99	$51.44
Elite Soccer	$10.06	$27.17
Emmitt Smith Football	$5.00	$7.91
Equinox	$16.90	$41.88
Exertainment Mountain Bike Rally	$17.89	$60.71
Exertainment Mountain Bike Rally SR	$1355.96	$2,683.00
Extra Innings	$6.92	$13.93
F-Zero	$10.69	$25.15
F-Zero [Player's Choice]	$11.22	$16.96
F1 Pole Position	$7.38	$16.76
F1 ROC II Race of Champions	$9.97	$17.75
F1 ROC Race of Champions	$7.84	$24.50
FIFA International Soccer	$5.01	$9.97
FIFA Soccer 96	$6.78	$13.11
FIFA Soccer 97	$8.22	$17.54
Faceball 2000	$6.00	$17.10
Family Dog	$9.12	$17.01
Family Feud	$3.84	$9.22
Fatal Fury	$8.57	$19.25
Fatal Fury 2	$9.84	$23.42
Fatal Fury Special	$27.44	$45.50
Fighter's History	$12.76	$38.45
Final Fantasy II	$32.50	$113.08
Final Fantasy III	$36.67	$125.50
Final Fantasy Mystic Quest	$10.34	$33.42
Final Fight	$13.84	$39.25
Final Fight 2	$39.00	$126.72
Final Fight 3	$83.70	$318.88
Final Fight Guy	$181.90	$870.00
Fire Striker	$100.69	$248.10
Firepower 2000	$22.44	$43.53

Game	Loose	Complete
First Samurai	$20.95	$58.51
Flashback The Quest for Identity	$12.82	$40.00
Flintstones the Movie	$6.99	$27.02
Football Fury	$7.98	$24.05
Foreman For Real	$4.61	$12.53
Frank Thomas Big Hurt Baseball	$2.58	$10.03
Frantic Flea	$7.50	$17.69
Frogger	$8.79	$13.49
Full Throttle	$5.92	$15.70
Fun 'n Games	$32.25	$549.54
GP-1	$7.99	$19.66
GP-1 Part II	$13.00	$23.93
Game Genie	$17.16	$29.99
Gemfire	$21.34	$62.99
Genghis Khan II Clan of the Gray	$15.98	$32.57
George Foreman's KO Boxing	$4.99	$14.62
Ghoul Patrol	$107.48	$201.33
Goal	$1.99	$10.60
Gods	$14.79	$29.23
Goof Troop	$17.27	$43.99
Gradius III	$10.45	$37.41
Gunforce	$17.99	$44.99
Hagane The Final Conflict	$522.29	$1749.00
Hal's Hole in One Golf	$5.12	$13.75
Hammerlock Wrestling	$11.90	$32.35
HardBall III	$4.52	$9.95
Harley's Humongous Adventure	$8.81	$20.00
Harvest Moon	$189.50	$443.31
Head-On Soccer	$8.70	$22.58
Hit the Ice	$10.98	$23.70
Home Alone	$6.79	$17.93
Home Alone 2 Lost In New York	$6.52	$15.23
Home Improvement	$44.98	$102.36
Hook	$11.17	$40.79
Hunt for Red October	$4.29	$15.51
Hurricanes	$101.75	$418.49
Hyper V-Ball	$11.36	$29.00
Hyperzone	$6.75	$22.99
Illusion of Gaia	$18.93	$50.00
Imperium	$58.00	$124.00
Incantation	$134.75	$377.52
Incredible Crash Dummies	$7.53	$17.92
Indiana Jones' Greatest Adventures	$19.47	$53.68
Inindo	$15.50	$40.96
Inspector Gadget	$21.48	$56.00
International Superstar Soccer	$70.91	$278.98
International Superstar Soccer Dlx	$52.49	$175.38
International Tennis Tour	$5.41	$16.31
Izzy's Quest for the Olympic Rings	$5.14	$27.60
Jack Nicklaus Golf	$5.74	$9.22
James Bond Jr	$7.60	$16.65
Jammit	$7.17	$11.43
Jeopardy	$5.24	$8.69
Jeopardy Deluxe Edition	$3.75	$6.75
Jeopardy Sports Edition	$3.00	$11.49
Jim Power	$6.60	$40.03

Game	Loose	Complete
Jimmy Connors Pro Tennis Tour	$8.82	$10.29
Jimmy Houston's Bass Tournament	$10.08	$35.41
Joe and Mac	$17.77	$41.69
Joe and Mac 2 Lost in the Tropics	$56.87	$120.85
John Madden Football	$5.17	$9.48
Judge Dredd	$6.73	$16.50
Jungle Strike	$6.15	$17.94
Jurassic Park	$6.93	$18.74
Jurassic Park 2 The Chaos Continues	$14.35	$37.77
Justice League Task Force	$10.82	$30.27
Ka-blooey	$6.56	$10.00
Kawasaki Caribbean Challenge	$6.28	$13.88
Kawasaki Superbike Challenge	$14.74	$37.21
Ken Griffey Jr Major League Baseball	$7.04	$20.16
Ken Griffey Jr's Winning Run	$5.50	$14.86
Ken Griffey Jr's Winning Run [NFR]	$26.66	UNK
Kendo Rage	$37.71	$91.29
Kid Klown in Crazy Chase	$7.58	$29.47
Killer Instinct	$8.94	$42.43
Killer Instinct [Not for Resale]	UNK	UNK
King Arthur and the Knights of Justice	$37.38	$100.93
King Arthur's World	$12.85	$33.35
King of Dragons	$75.00	$170.31
King of the Monsters	$7.77	$19.23
King of the Monsters 2	$10.75	$32.91
Kirby Super Star	$32.84	$97.00
Kirby's Avalanche	$11.90	$26.15
Kirby's Dream Course	$19.99	$46.79
Kirby's Dream Land 3	$82.30	$261.54
Knights of the Round	$68.58	$193.77
Krusty's Super Fun House	$10.00	$28.49
Kyle Petty's No Fear Racing	$7.65	$21.42
Lagoon	$13.00	$31.31
Lamborghini American Challenge	$16.23	$44.98
Last Action Hero	$8.39	$20.03
Lawnmower Man	$5.47	$12.29
Legend	$65.66	$192.58
Legend of the Mystical Ninja	$30.91	$118.84
Lemmings	$13.26	$25.58
Lemmings 2 The Tribes	$16.38	$40.01
Lester the Unlikely	$8.95	$25.99
Lethal Enforcers	$9.99	$95.00
Lethal Enforcers [Gun Bundle]	$39.79	$93.39
Lethal Weapon	$7.02	$18.56
Liberty or Death	$28.25	$64.49
Lock On	$10.00	$14.99
Looney Tunes B-Ball	$24.55	$45.98
Lord of Darkness	$15.49	$38.50
Lord of the Rings	$11.90	$27.12
Lost Vikings 2	$48.04	$79.27
Lufia II Rise of Sinistrals	$64.99	$131.25
Lufia and The Fortress of Doom	$35.00	$81.31
M.A.C.S. Multipurpose ...Simulator	$1168.17	$3,000.00
MLBPA Baseball	$3.86	$10.30
Madden 93	$3.73	$9.42
Madden 96	$3.48	$9.99

Game	Loose	Complete
Madden 97	$3.81	$6.40
Madden 98	$7.33	$14.99
Madden NFL '94	$3.00	$9.62
Madden NFL '95	$3.84	$8.86
Magic Boy	$17.75	$27.50
Magic Johnson's Super Slam Dunk	$3.22	$11.05
Magic Sword	$25.00	$68.47
Magical Quest starring Mickey Mouse	$14.99	$39.26
Mario Paint	$6.91	$51.04
Mario Paint [Mouse Bundle]	$16.60	$41.68
Mario Paint [Player's Choice]	$22.00	$75.00
Mario is Missing	$9.95	$30.11
Mario's Early Years Fun W/ Numbers	$9.99	$60.88
Mario's Early Years Fun with Letters	$10.75	$49.99
Mario's Early Years Preschool Fun	$9.69	$107.91
Mario's Time Machine	$10.13	$30.97
Mark Davis the Fishing Master	$5.79	$13.25
Marvel Super Heroes in ... the Gems	$33.69	$89.99
Mary Shelley's Frankenstein	$11.99	$29.44
Math Blaster Episode 1	$5.93	$28.20
Maui Mallard in Cold Shadow	$24.28	$59.95
Mecarobot Golf	$8.05	$17.30
MechWarrior	$6.42	$23.47
MechWarrior 3050	$13.49	$36.00
Mega Man 7	$149.97	$393.04
Mega Man Soccer	$39.06	$159.50
Mega Man X	$18.86	$65.41
Mega Man X [30th Ann. Edition]	$101.25	$104.99
Mega Man X2	$75.00	$222.23
Mega Man X3	$165.26	$521.84
Metal Combat	$5.88	$13.33
Metal Marines	$63.01	$128.49
Metal Morph	$45.99	$120.42
Metal Warriors	$195.26	$488.15
Michael Andretti's Indy Car Challenge	$5.20	$17.35
Michael Jordan Chaos ... Windy City	$8.30	$25.00
Mickey Mania	$9.93	$31.48
Mickey's Ultimate Challenge	$7.08	$24.07
Micro Machines	$26.39	$61.50
Might and Magic III Isles of Terra	$19.88	$48.61
Mighty Morphin Power Rangers	$13.25	$29.64
Mighty Morphin Power RangersMovie	$27.97	$68.00
Mini Super Nintendo System	$59.24	$159.95
Miracle Piano	$29.00	$171.26
Mohawk and Headphone Jack	$16.92	$42.53
Monopoly	$3.95	$8.45
Mortal Kombat	$10.55	$28.22
Mortal Kombat 3	$8.90	$24.89
Mortal Kombat II	$11.49	$30.98
Mortal Kombat II [Not for Resale]	UNK	UNK
Mr. Do!	$30.77	$67.88
Mr. Nutz	$70.00	$203.44
Ms. Pac-Man	$8.59	$14.99
Musya Classic Japanese ... Horror	$63.47	$145.66
NBA All-Star Challenge	$3.61	$6.11
NBA Give 'n Go	$10.47	$20.99

Game	Loose	Complete
NBA Hang Time	$5.82	$13.95
NBA Jam	$7.89	$27.25
NBA Jam Tournament Edition	$8.46	$21.69
NBA Live 95	$2.85	$9.99
NBA Live 96	$4.85	$10.99
NBA Live 97	$4.88	$8.41
NBA Live 98	$7.32	$20.24
NBA Showdown	$4.47	$12.08
NCAA Basketball	$4.28	$7.69
NCAA Basketball [Not for Resale]	$24.99	UNK
NCAA Final Four Basketball	$4.52	$5.87
NCAA Football	$4.39	$9.50
NFL Football	$4.50	$9.05
NFL Quarterback Club	$2.95	$9.63
NFL Quarterback Club 96	$1.50	$7.50
NHL 94	$7.83	$20.00
NHL 95	$6.00	$13.50
NHL 96	$6.56	$11.62
NHL 97	$8.07	$11.75
NHL 98	$18.72	$31.58
NHL Stanley Cup	$3.52	$7.51
NHLPA Hockey '93	$4.60	$10.84
Natsume Championship Wrestling	$12.11	$25.00
Newman Haas Indy ... Nigel Mansell	$5.52	$10.78
Nickelodeon GUTS	$10.00	$25.69
Nigel Mansell's World ... Racing	$6.00	$8.03
Ninja Gaiden Trilogy	$108.79	$250.00
Ninja Warriors	$82.00	$389.44
Nintendo Campus Challenge 1992	$4000	UNK
Nintendo ...1992 [Reproduction]	$39.06	$105.43
Nintendo Powerfest 1994	$12000	UNK
No Escape	$11.89	$31.15
Nobunaga's Ambition	$15.29	$25.02
Nolan Ryan's Baseball	$5.29	$14.07
Nosferatu	$81.91	$171.00
Obitus	$10.76	$29.99
Ogre Battle The March...Black Queen	$93.08	$188.37
Olympic Summer Games Atlanta 96	$4.68	$9.95
On the Ball	$11.88	$16.31
Operation Europe Path ...1939-45	$11.55	$31.99
Operation Logic Bomb	$29.33	$48.13
Operation Thunderbolt	$52.50	$116.23
Oscar	$63.30	$222.50
Out of This World	$8.77	$24.43
Out to Lunch	$14.61	$30.98
Outlander	$8.88	$26.86
P.T.O.	$12.55	$36.16
P.T.O. II	$15.64	$36.00
PGA European Tour	$9.62	$15.72
PGA Tour 96	$6.62	$11.61
PGA Tour Golf	$3.85	$10.60
Pac-Attack	$8.25	$17.50
Pac-In-Time	$18.69	$40.37
Pac-Man 2 The New Adventures	$6.14	$10.48
Packy and Marlon	$42.53	$97.01
Paladin's Quest	$25.49	$56.00

Game	Loose	Complete
Paperboy 2	$7.07	$14.42
Peace Keepers	$52.19	$89.54
Pebble Beach Golf Links	$5.53	$10.66
Phalanx	$19.99	$42.64
Phantom 2040	$14.18	$46.79
Pieces	$20.51	$85.94
Pilotwings	$10.88	$24.00
Pinball Dreams	$7.99	$14.99
Pinball Fantasies	$7.00	$23.93
Pink Goes to Hollywood	$7.19	$18.99
Pinocchio	$11.94	$33.17
Pirates of Dark Water	$55.61	$124.02
Pit-Fighter	$5.50	$14.15
Pitfall Mayan Adventure	$7.13	$14.78
Plok	$14.99	$41.29
Pocky & Rocky	$93.33	$207.28
Pocky and Rocky 2	$252.30	$1050.30
Populous	$4.33	$12.79
Porky Pig's Haunted Holiday	$5.98	$20.55
Power Instinct	$29.99	$57.00
Power Moves	$7.66	$20.69
Power Piggs of the Dark Age	$25.47	$71.04
Power Rangers Fighting Edition	$18.50	$50.11
Power Rangers Zeo Battle Racers	$9.47	$20.00
Prehistorik Man	$25.47	$64.80
Primal Rage	$7.51	$21.77
Prince of Persia	$9.99	$27.24
Prince of Persia 2	$26.50	$42.12
Pro Quarterback	$3.79	$10.00
Pro Sport Hockey	$7.90	$16.29
Push-Over	$10.09	$22.87
Q*bert 3	$15.93	$35.80
R-Type III The Third Lightning	$104.99	$285.00
Race Drivin	$4.05	$19.00
Radical Psycho Machine ...Racing	$5.68	$25.10
Radical Rex	$15.71	$35.00
Raiden Trad	$15.87	$36.60
Rampart	$13.00	$26.16
Ranma 1/2 Hard Battle	$8.26	$54.50
RapJam Volume One	$6.99	$19.17
Realm	$28.89	$77.98
Redline F-1 Racer	$7.07	$22.57
Relief Pitcher	$17.09	$68.68
Revolution X	$4.63	$14.16
Rex Ronan Experimental Surgeon	$48.65	$124.07
Riddick Bowe Boxing	$6.70	$7.96
Rise of the Phoenix	$24.52	$66.20
Rise of the Robots	$4.93	$14.50
Rival Turf	$10.00	$27.74
Road Riot 4WD	$5.39	$13.88
Road Runner's Death Valley Rally	$5.85	$16.61
Robocop 3	$7.91	$27.10
Robocop vs The Terminator	$9.62	$60.42
Robotrek	$41.75	$124.97
Rock 'n Roll Racing	$33.52	$84.50
Rocko's Modern Life	$13.99	$50.00

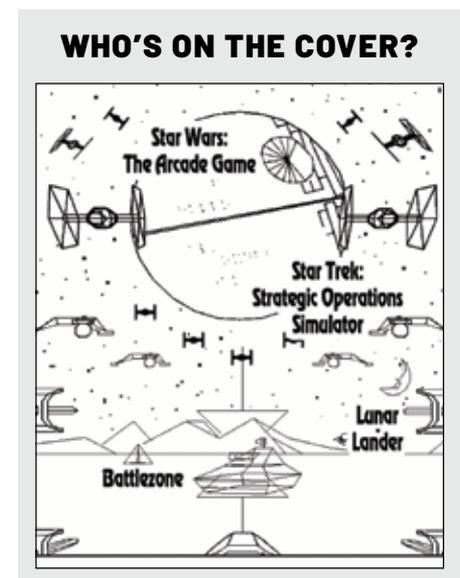| Game	Loose	Complete
Rocky Rodent	$9.60	$39.00
Roger Clemens' MVP Baseball	$4.41	$11.30
Romance of the Three Kingdoms II	$18.99	$37.67
Romance of the Three Kingdoms III	$17.85	$42.94
Romance of the Three Kingdoms IV	$13.99	$36.29
Run Saber	$69.91	$155.23
S.O.S.	$82.56	$131.23
S.O.S: Sink or Swim	$67.16	$104.98
SWAT Kats	$92.00	$173.07
Samurai Shodown	$10.98	$28.58
Saturday Night Slam Masters	$20.49	$62.00
Scooby Doo Mystery	$6.35	$17.24
Sea Quest DSV	$12.20	$28.95
Secret of Evermore	$25.93	$57.50
Secret of Mana	$40.00	$120.18
Separation Anxiety	$18.63	$75.07
Shadowrun	$35.00	$83.43
Shanghai II Dragon's Eye	$4.31	$11.25
Shaq Fu	$6.00	$16.24
Shien's Revenge	$73.35	$142.00
Sid Meier's Civilization	$21.28	$31.26
Side Pocket	$10.74	$23.77
Sim Earth the Living Planet	$4.37	$18.99
SimAnt	$15.67	$36.19
SimCity	$6.91	$20.63
SimCity 2000	$15.87	$36.61
SimCity [Player's Choice]	$14.99	$39.99
Skiing & Snowboarding: Tommy Moe's Winter Extreme	$3.64	$13.20
Skuljagger	$11.12	$34.40
Skyblazer	$54.99	$102.58
Smartball	$8.50	$19.89
Snow White in Happily Ever After	$19.11	$75.28
Soldiers of Fortune	$19.88	$44.38
Sonic Blast Man	$19.97	$54.06
Sonic Blast Man 2	$85.00	$275.00
Soul Blazer	$66.03	$138.01
Space Ace	$7.99	$15.50
Space Football	$7.90	$14.76
Space Invaders	$7.83	$13.29
Space MegaForce	$144.67	$325.00
Spanky's Quest	$16.49	$53.00
Sparkster	$97.69	$275.00
Spawn	$9.99	$48.04
Spectre	$7.05	$17.68
Speed Racer	$14.67	$66.19
Speedy Gonzales Los Gatos Bandidos	$6.99	$26.17
Spiderman	$15.03	$38.72
Spiderman Maximum Carnage	$26.75	$66.50
Spiderman Maximum Carnage Collector's Edition	$77.09	$354.34
Spiderman X-Men Arcade's Revenge	$6.00	$21.24
Spindizzy Worlds	$7.81	$15.91
Sports Illustrated Championship Football & Baseball	$4.02	$8.75
Star Fox	$11.69	$34.99
Star Fox Super Weekend Competition	$1,000.00	UNK

Game	Loose	Complete
Star Fox [Not for Resale]	$99.00	UNK
Star Trek Deep Space Nine Crossroads of Time	$12.92	$23.63
Star Trek Starfleet Academy	$10.25	$22.44
Star Trek the Next Generation	$6.57	$21.00
Stargate	$9.58	$29.24
Steel Talons	$12.00	$41.04
Sterling Sharpe: End 2 End	$7.71	$13.29
Stone Protectors	$40.50	$169.98
Street Combat	$6.17	$19.50
Street Fighter Alpha 2	$39.72	$107.25
Street Fighter II	$8.99	$25.56
Street Fighter II Turbo	$13.50	$31.50
Street Fighter II Turbo [Not for Resale]	$93.98	UNK
Street Fighter II [30th Anniversary Edition]	$104.37	$133.16
Street Fighter II [Not for Resale]	$92.99	UNK
Street Hockey 95	$6.95	$19.64
Street Racer	$20.25	$54.26
Strike Gunner STG	$37.51	$75.00
Stunt Race FX	$7.47	$26.24
Stunt Race FX [Not for Resale]	$42.00	UNK
Sunset Riders	$63.20	$235.80
Super 3D Noah's Ark	$86.25	$199.95
Super Advantage Controller	$23.99	$102.05
Super Adventure Island	$16.85	$45.49
Super Adventure Island II	$70.00	$162.75
Super Alfred Chicken	$10.10	$20.12
Super Aquatic Games	$6.61	$22.17
Super Baseball 2020	$10.88	$22.69
Super Baseball Simulator 1.000	$6.48	$7.72
Super Bases Loaded	$3.99	$9.07
Super Bases Loaded 2	$8.73	$12.89
Super Bases Loaded 3	$5.89	$15.10
Super Batter Up	$5.99	$14.99
Super Battleship	$2.97	$9.72
Super Battletank 2	$4.23	$9.39
Super Battletank War in the Gulf	$4.95	$10.71
Super Black Bass	$5.99	$8.38
Super Bomberman	$29.41	$130.74
Super Bomberman 2	$24.82	$47.95
Super Bomberman Party Pack	$60.31	$272.11
Super Bonk	$47.42	$139.99
Super Bowling	$5.75	$16.75
Super Buster Bros.	$19.59	$58.95
Super Caesar's Palace	$3.96	$5.19
Super Castlevania IV	$35.82	$80.00
Super Chase HQ	$13.93	$28.54
Super Conflict	$8.22	$17.75
Super Copa	$154.18	$942.89
Super Double Dragon	$31.62	$99.00
Super Gameboy	$14.99	$39.99
Super Ghouls 'N Ghosts	$21.41	$62.95
Super Goal! 2	$13.83	$46.95
Super Godzilla	$7.63	$22.85
Super High Impact	$3.76	$10.18
Super James Pond	$9.05	$26.71

Game	Loose	Complete
Super Mario All-Stars	$15.59	$39.94
Super Mario All-Stars [Player's Choice]	$14.76	$34.99
Super Mario All-stars and Super Mario World	$23.97	$82.50
Super Mario Kart	$22.70	$45.60
Super Mario Kart [Player's Choice]	$23.12	$43.99
Super Mario RPG	$39.97	$116.22
Super Mario World	$10.25	$110.00
Super Mario World 2 Yoshi's Island	$27.75	$61.65
Super Mario World 2 Yoshi's Island [Not for Resale]	$52.21	UNK
Super Mario World [Player's Choice]	$24.99	$99.99
Super Metroid	$40.48	$110.09
Super Metroid [Player's Choice]	$35.90	$88.49
Super Ninja Boy	$16.55	$50.99
Super Nintendo Classic Edition	$52.97	$68.91
Super Nintendo Controller	$11.66	$40.99
Super Nintendo Donkey Kong System	$90.26	$241.38
Super Nintendo Killer Instinct System	$49.99	$221.06
Super Nintendo Mario All-Stars & Mario World System	$124.07	$334.99
Super Nintendo Mouse	$12.68	$40.45
Super Nintendo Super Set System	$66.87	$183.45
Super Nintendo System	$38.00	$118.20
Super Nova	$28.00	$91.43
Super Off Road	$10.20	$13.71
Super Off Road The Baja	$3.96	$10.21
Super Pinball Behind the Mask	$5.79	$9.99
Super Play Action Football	$2.93	$6.59
Super Punch Out	$19.99	$52.27
Super Putty	$6.44	$18.94
Super R-Type	$9.17	$38.21
Super RBI Baseball	$8.39	$17.02
Super Scope 6	$16.00	$69.50
Super Scope 6 [Gun Bundle]	$43.19	$69.49
Super Slap Shot	$6.18	$14.29
Super Smash TV	$19.13	$37.58
Super Soccer	$7.59	$16.99
Super Soccer Champ	$8.38	$21.62
Super Solitaire	$6.95	$14.99
Super Star Wars	$8.55	$27.18
Super Star Wars Empire Strikes Back	$9.71	$26.26
Super Star Wars Return of the Jedi	$8.77	$30.88
Super Star Wars [Player's Choice]	$10.00	$23.74
Super Street Fighter II	$15.91	$40.50
Super Strike Eagle	$6.92	$17.74
Super Tennis	$6.28	$10.25
Super Troll Island	$12.27	$36.55
Super Turrican	$36.14	$92.98
Super Turrican 2	$176.51	$540.28
Super Valis IV	$31.96	$109.54
Super Widget	$15.67	$63.88
Suzuka 8 Hours	$6.51	$16.19
Syndicate	$102.01	$146.09
T2 The Arcade Game	$7.72	$18.93
TKO Super Championship Boxing	$10.77	$23.70
TNN Bass Tournament of Champions	$5.74	$16.32

Game	Loose	Complete
Taz-Mania	$4.39	$10.25
Tecmo Secret of the Stars	$36.93	$99.13
Tecmo Super Baseball	$5.18	$9.49
Tecmo Super Bowl	$10.31	$23.08
Tecmo Super Bowl II Special Edition	$50.91	$92.86
Tecmo Super Bowl III	$14.99	$26.04
Tecmo Super NBA Basketball	$3.53	$10.78
Teenage Mutant Ninja Turtles IV Turtles in Time	$36.66	$142.50
Teenage Mutant Ninja Turtles IV Turtles in Time [Not for Resale]	$116.39	UNK
Teenage Mutant Ninja Turtles Tournament Fighters	$14.99	$58.85
Terminator	$10.57	$23.10
Terminator 2 Judgment Day	$7.89	$27.32
Terranigma [English Reproduction]	$40.89	$41.79
Tetris 2	$7.43	$11.53
Tetris 2 [Player's Choice]	$10.00	$12.69
Tetris Attack	$11.23	$26.12
Tetris Attack [Not for Resale]	$35.36	UNK
Tetris and Dr. Mario	$17.99	$25.00
Tetris and Dr. Mario [Player's Choice]	$15.49	$41.82
The 7th Saga	$17.98	$53.50
The Addams Family	$10.99	$25.89
The Adventures of Kid Kleets	$28.09	$150.00
The Adventures of Rocky and Bullwinkle and Friends	$11.50	$20.00
The Brainies	$20.25	$65.65
The Combatribes	$23.53	$78.52
The Death and Return of Superman	$29.99	$100.57
The Duel Test Drive II	$9.91	$41.26
The Flintstones Treasure ...Madrock	$50.74	$129.99
The Great Circus Mystery Starring Mickey and Minnie	$12.69	$34.99
The Great Waldo Search	$8.61	$27.99
The Ignition Factor	$17.97	$31.44
The Incredible Hulk	$12.00	$31.99
The Itchy and Scratchy Game	$21.17	$73.77
The Jetsons Invasion...Planet Pirates	$73.32	$193.76
The Jungle Book	$5.45	$15.53
The Lion King	$8.47	$26.34
The Lost Vikings	$22.17	$49.00
The Mask	$32.49	$122.96
The Pagemaster	$7.39	$17.15
The Ren and Stimpy Show Buckeroos	$82.10	$597.51
The Ren and Stimpy Show Fire Dogs	$29.99	$99.52
The Ren and Stimpy Show Time Warp	$18.99	$88.90
The Ren and Stimpy Show Veediots	$8.04	$26.00
The Rocketeer	$4.14	$13.07
The Simpsons Bart's Nightmare	$16.18	$33.28
The Skins Game	$6.09	$16.40
The Sporting News Baseball	$6.00	$13.57
The Tick	$14.92	$43.62
The Twisted Tales of Spike McFang	$90.00	$165.79
The Untouchables	$7.68	$24.89
Thomas the Tank Engine and Friends	$10.72	$23.74
Thunder Spirits	$15.00	$50.00
Time Cop	$28.10	$100.85

Game	Loose	Complete
Time Trax	$15.68	$42.34
Timeslip	$15.80	$37.66
Timon and Pumbaa Jungle Games	$5.02	$9.20
Tinstar	$8.53	$24.16
Tiny Toon Adventures Buster Busts Loose	$7.99	$27.28
Tiny Toon Adventures Wacky Sports Challenge	$18.50	$52.77
Tom and Jerry	$8.99	$23.50
Tony Meola's Sidekicks Soccer	$5.68	$15.50
Top Gear	$12.73	$25.37
Top Gear 2	$15.00	$51.22
Top Gear 3000	$39.99	$74.99
Total Carnage	$9.99	$29.00
Toy Story	$7.36	$21.88
Toys	$3.63	$12.18
Troddlers	$9.99	$21.06
Troy Aikman NFL Football	$4.90	$8.99
True Lies	$23.81	$82.18
Tuff E Nuff	$9.25	$22.49
Turn and Burn No Fly Zone	$5.63	$19.49
UN Squadron	$17.83	$71.12
Ultima Runes of Virtue II	$13.90	$36.00
Ultima The Black Gate	$47.00	$61.18
Ultima The False Prophet	$11.51	$28.47
Ultimate Fighter	$13.21	$35.94
Ultimate Mortal Kombat 3	$20.00	$52.99
Ultraman	$5.04	$19.99
Uncharted Waters	$31.99	$65.78
Uncharted Waters New Horizons	$34.54	$95.29
Unholy Night: Darkness...[Homebrew]	$7.27	$19.99
Uniracers	$12.37	$35.99
Urban Strike	$7.50	$22.47
Utopia The Creation of a Nation	$9.09	$26.74
Vegas Stakes	$3.01	$8.10
Virtual Bart	$16.65	$47.03
Vortex	$4.99	$17.74
WCW Superbrawl Wrestling	$17.56	$43.98
WWF Raw	$7.47	$23.41
WWF Royal Rumble	$7.25	$14.99
WWF Super Wrestlemania	$5.43	$12.00
WWF Wrestlemania Arcade Game	$9.90	$22.63
Waialae Country Club	$2.22	$6.58
War 2410	$29.51	$85.60
War 3010 The Revolution	$14.50	$30.00
Wario's Woods	$9.99	$22.75
Warlock	$7.02	$14.25
WarpSpeed	$8.71	$17.57
Wayne Gretzky and the NHLPA All-Stars	$5.60	$10.64
Wayne's World	$8.13	$24.61
We're Back A Dinosaur Story	$5.64	$18.13
WeaponLord	$19.88	$36.57
Wheel of Fortune	$5.25	$6.41
Wheel of Fortune Deluxe Edition	$4.38	$7.50
Where in Time is Carmen Sandiego	$9.65	$31.69
Where in the World is Carmen Sandiego	$17.70	$38.20
Whizz	$18.45	$40.00

Game	Loose	Complete
Wicked 18	$8.39	$22.50
Wild Guns	$197.73	$672.24
WildSnake	$3.96	$12.93
Wildcats	$24.99	$90.34
Williams Arcade's Greatest Hits	$6.97	$18.35
Wing Commander	$4.56	$13.00
Wing Commander Secret Missions	$7.95	$27.05
Wings 2 Aces High	$5.93	$16.04
Winter Olympic Games Lillehammer 94	$4.55	$12.42
Wizard of Oz	$13.07	$34.99
Wizardry V Heart of the Maelstrom	$9.00	$23.50
Wolfchild	$12.04	$24.97
Wolfenstein 3D	$27.96	$70.00
Wolverine Adamantium Rage	$14.11	$47.37
Wordtris	$4.32	$10.55
World Cup USA '94	$5.63	$12.88
World Heroes	$6.60	$23.38
World Heroes 2	$10.38	$33.62
World League Soccer	$4.77	$9.05
World Soccer 94 Road to Glory	$32.99	$156.42
X-Band Modem	$45.00	$98.69
X-Kaliber 2097	$13.58	$33.99
X-Men Mutant Apocalypse	$11.48	$39.95
X-Zone	$7.93	$15.80
Xardion	$20.00	$53.97
Yoshi's Cookie	$7.99	$24.04
Yoshi's Safari	$9.57	$21.99
Young Merlin	$9.20	$23.99
Ys III Wanderers from Ys	$18.29	$50.50
Zelda Link to the Past	$20.25	$69.83
Zelda Link to the Past [Player's Choice]	$20.65	$63.75
Zero the Kamikaze Squirrel	$118.97	$399.14
Zombies Ate My Neighbors	$27.88	$77.77
Zombies Ate My Neighbors [Box Variant]	$323.93	$738.18
Zool Ninja of the Nth Dimension	$9.50	$26.41
Zoop	$3.07	$8.61

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Star Trek: Strategic Operations Simulator

Lunar Lander

Battlezone

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MAGAZINE

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