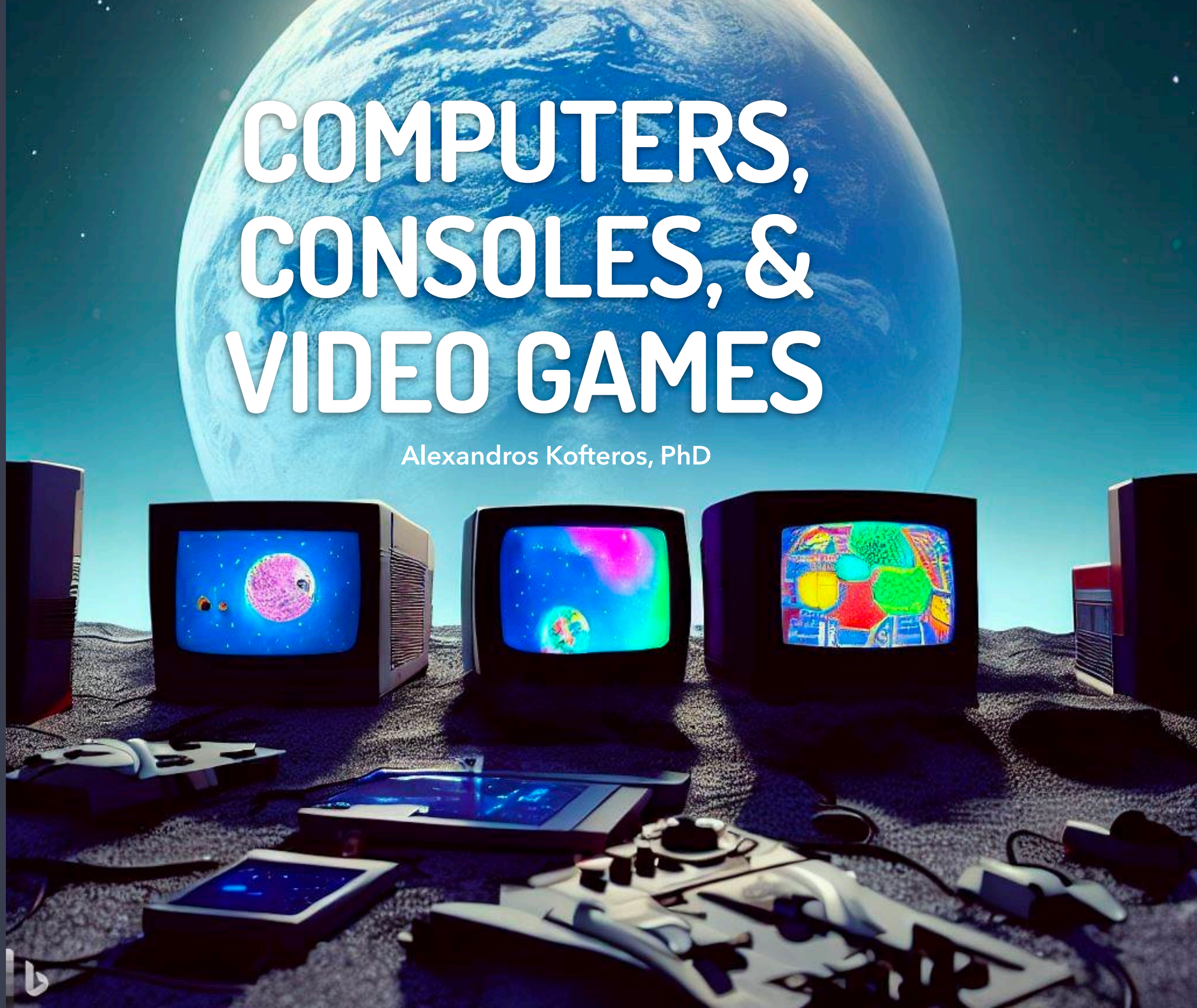




COMPUTERS, CONSOLES, & VIDEO GAMES

Alexandros Kofteros, PhD



Computers, Consoles, & Video Games

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- In this ebook we will learn about significant milestones in the development of the first video games.
- We will understand the significance of specific machines (game consoles, computers) to the development of a new, gigantic industry.
- We will meet the 50 most significant games that inspired entire genres of video games that followed.



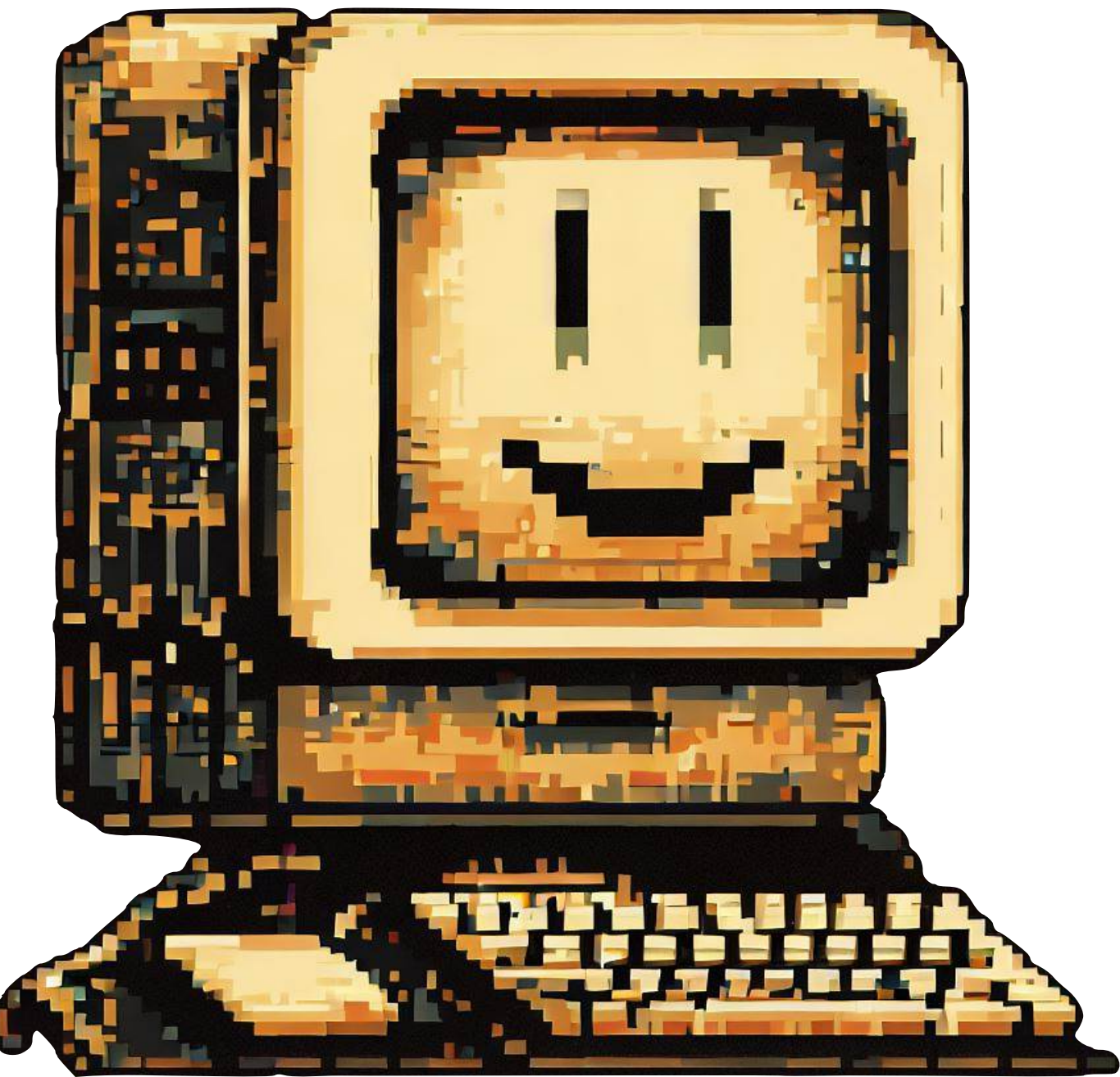
About this book

Welcome to a journey through the history of personal computers! This book began its writing process in 2014, an initial version was created in 2018, and it was further enriched in 2019.

The book was not an easy accomplishment: I had to cover the development of the first video game consoles and video games, including all personal computers destined for “home” use, therefore you will come across the term “home computer” quite often. The eras presented are divided into 10 chapters, grouped into 3 parts. These include the developments of the first era and generation of personal computers and consoles, to the video game crash of 1983, and eventually to the rebirth of the industry. Even though the video game crash happened in the US, it affected the entire world, as some of the most prominent companies went bankrupt.

The material for this book was collected over a ten-year period, based on magazine articles (Advanced Computer Entertainment, The Edge, Pixel (Greek), Byte, Mac User, Mac Format (UK), books, and interviews with industry pioneers such as Roberta and Ken Williams, Ron Gilbert, David Fox, Francois Lionet, R J Mical, the Coles and more.

Welcome!



This is a book that was for over 10 years in development. By working back and forth on its content since 2014, I have attempted to approach a very difficult subject: how to combine the history of video game consoles, home computers and video games under one roof. To be honest, some of the machines mentioned here deserve their own book (and some of them actually have, be it the Amiga, the Atari ST, the Apple Macintosh, to name a few).

So, then, why one book and not 3 separate books? The answer is not easy but it has to do with the way the home industry was developed: at first, video games were embedded in the hardware. And the home computer revolution happened exactly because of the video games (something that Sir Clive Sinclair learned to his own disappointment). Therefore, by approaching the subject on the home computer front, it would have been difficult to separate the three.

Foreword...

I have to say what an honor it is to be asked to write a foreword for this epic publication.

It is interesting that my involvement in this story actually begins exactly where Commodore's story begins - with the Commodore PET. In June of 1983, I was specifically recruited to expand the distribution of what was then Commodore's only serious business product, the PET, by getting it stocked in the retail market - a bold and innovative concept at that time. However, as an indication of the volatile nature of the market during 1983, in September of that year, Commodore International announced they were stopping production of the PET range of computers.

This could have left me unemployed, but as luck would have it, the C64, which had been released by the Consumer Division in the UK around October 1982, was selling very well. The Key Accounts Manager at the time (reporting to the Sales Manager) had resigned, and I was

given that role.
Right place, right time!

To be candid, I found myself in the most perfect job for me, because not only am I a very good salesman, but I have also proven myself to be a very creative marketer. In the role of Key Accounts Manager (which meant I was responsible for all the major retailers in the UK), I was given the opportunity to reinvent the way in which we presented our products to the end user.

I came up with the concept: "From now on, we do not sell computers - we sell dreams," which gave rise to the "themed bundles" we produced - initially for the C64. These always included a couple of "top titles" and several other games and/or productivity-based software (to justify the parents' expenditure as it was "for my child's education").



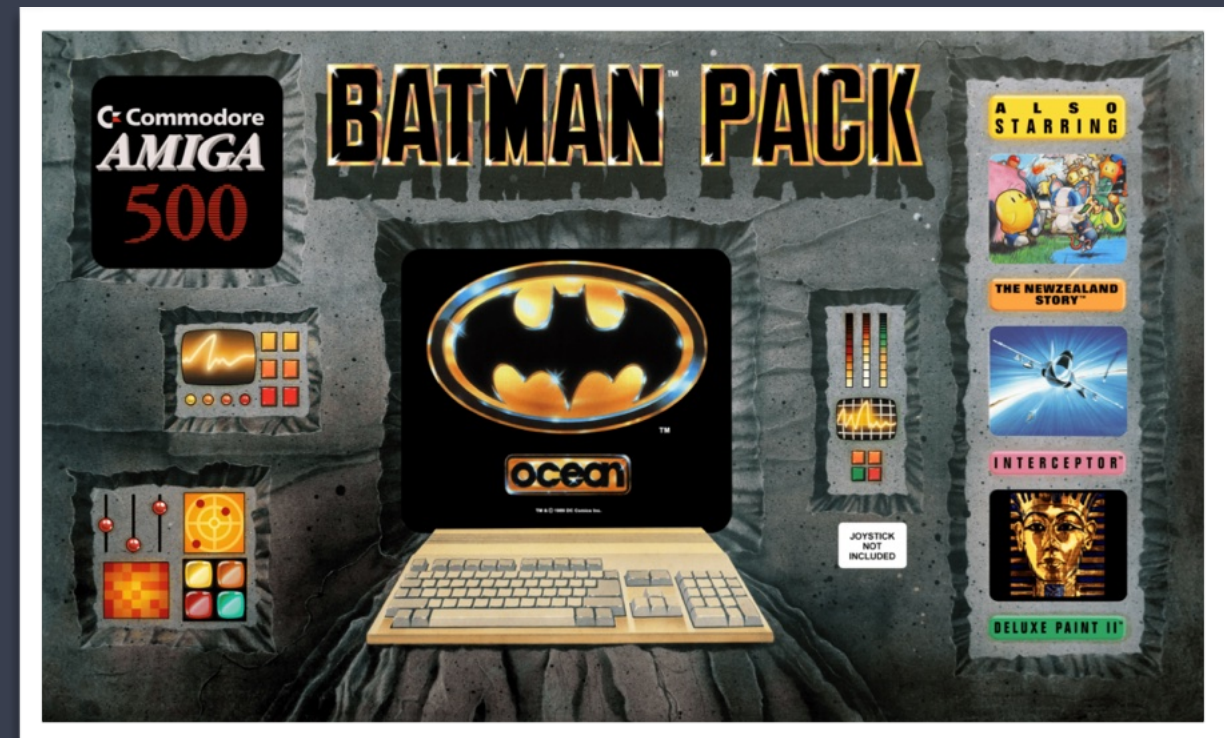
This activity, including “Night Moves,” “Playful Intelligence,” “Light Fantastic” (featuring a light gun), “Connoisseur’s Collection” (featuring a mouse-driven art package), and many other innovative bundles, resulted in Commodore UK outselling all other subsidiaries by a huge margin. This success kept the C64 selling at least two years longer than its true “sell-by date.”

It must be noted that all our competitors eventually followed our creativity and began offering “bundles” as standard.

Of course, we followed our own lead once we had our consumer version of the Amiga – the A500 – when we launched the phenomenal “Batman Pack,” which sold 186,000 units in its first 12 weeks of sales.

Getting to the DNA of this amazing time in history, it must be remembered that we were at the heart of what was only a “cottage industry” at the time. Everybody knew everybody else, and while we were competitors during the day, we would often share a beer (or three) at the bar together in the evening. Great times.

Now, it is a multi-billion-dollar business where, sadly, people tend to be just “numbers,” and it is all about “revenue generation” and much less about “content”



However, the industry now employs millions of people from around the globe, and it is wonderful that this publication pays tribute to the “founding fathers” of both hardware and software in such a well-researched and colorful manner. Well done, Alexandros.

David John Pleasance

Ex-Commodore 1983-1994

"It's chilling to recall how this cast of young and inexperienced people who cared more than anything about doing great things created what is perhaps the key technology of our lives".

Steven Wozniak ("Revolution in the Valley": The Insanely Great Story of How the Mac was Made)

Part A: Games

All about games . . .

Every story has to start somewhere, someplace, somehow... our species has evolved through the millennia, developing tools and gathering resources. At the same time, our ancestors felt the need to entertain themselves. Archaeologists have uncovered evidence of ancient toys as early as 3500 BCE in ancient Mesopotamia and Egypt. One of the most interesting of those was the board game Senet, depicted in fresco paintings in an Egyptian tomb.

These are believed to represent the earliest creations of our species, not only for playing but -possibly- for learning as well. In ancient Greece and Rome, toy dolls made of wood, clay or other materials, were very popular. Board games like Ludus Latruncolurum were created in ancient Rome, while other games such as Go (to which we will refer later) were created in ancient China. Games, toys, puzzles, continued to be refined and tweaked, leading up to modern (digital) games that -almost- can truly immerse the player into another world. In **Part A** of this book, we take a glimpse into the evolution of (video) games.



• Chapter 1 •

In the beginning...

Every story begins somewhere

"Man is still the most amazing
computer of all"

(JFK)

Computer Games

Even before the creation of the first microprocessor, scientists and engineers dreamed -and in some cases developed- games controlled using a computer. From the vision of Alan Turing for a computer that could play chess, up to the inventions of Ralph Baer, the early computers promised the potential for a new type of games, but underdelivered, or they could not justify the cost.

In **Chapter 1** of this book, we take a short detour from the world of personal computers and video game consoles, to introduce the ancestors of what we take for granted today, presenting some of the major milestones that fueled the imagination of countless engineers to dream the modern video games -and core technologies- we use today.



Turochamp (1948)

One of the first attempts to create a video game came -not unsurprisingly- from one of the greatest mathematicians of all time: Alan Turing. Turing was an exceptionally bright mathematician, specialising in decoding encrypted messages during World War II. In fact, he is credited for deciphering the Enigma machine, an unbreakable -or so the Germans thought- code at the time. In order to do that, he created the Bombe, a machine that enabled his team accelerate the breaking of the Enigma codes.

However, Alan Turing, even though he was fascinated with encrypted messages and mathematics, also had another dream: to create the first game that could be played against a computer. As such, in 1948, along with David Champernowne, he envisioned a very complex computer chess program that is now known as 'Turochamp'. But, as with the Analytical Engine (almost) a century earlier, his idea could not be implemented on the primitive computers of his era.



Bertie the Brain (1950)

What Turing dreamed, but the technology of his time could not materialise, would soon attain followers (albeit, unknowingly). Josef Kates, in 1950, created a huge computer that could play Tic-Tac-Toe against human players. Players interacted with the computer using a grid with lit buttons, choosing their moves by pressing the respective buttons. Bertie would then counter with “his” own move.

The game was presented at the Canadian National Exhibition in 1950, and it made a tremendous impact on what could be possible with machines. In fact, it was so successful, that attendees at the exhibition, were waiting in long lines during its two-week duration, for a chance to play against the computer. For more experienced players, Kates adjusted the difficulty of the game to offer a greater challenge. Unfortunately, the machine was disassembled after the exhibition, and the technology used (called addition tubes) were soon surpassed by transistors.

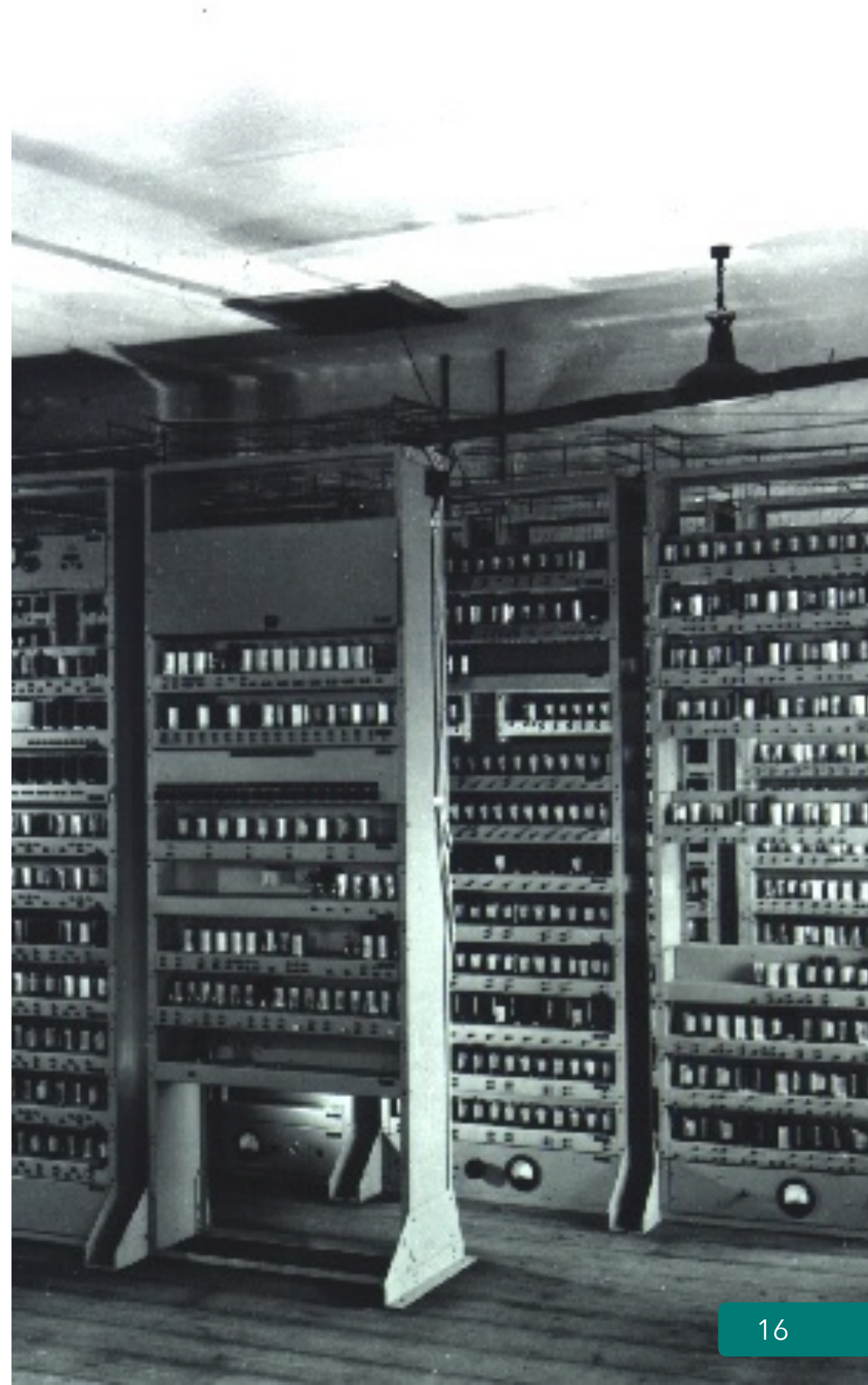


OXO (1952)

In 1952, Alexander Douglas created one of the first “real” video games, for the primitive yet groundbreaking for its time, EDSAC (Electronic Delay Storage Automatic Calculator). Douglas was working on his doctoral thesis on human-computer interaction, and he used one of the Cathode Ray Tubes (CRTs) of the EDSAC to display a game of noughts and crosses (later called OXO).

The user (or “early gamer”) used a controller resembling a rotary phone, to select their move on a standard -yet electronic- grid consisting of three lines and three columns (3x3). Following the move of the user, the computer would show its own move.

Even though OXO is considered one of the first video games, it was not available to the public, and could only be played by the scientists and researchers using the EDSAC.



Tennis for Two (1958)

Tennis for Two (1958) is a contender for the title of the first video game designed purely for entertainment. Created by William Higinbotham, a physicist, it was not only one of the first video games, but also the first sports video game.

Unlike earlier electronic games used for research or computer promotion, Tennis for Two offered a simple tennis simulation on an oscilloscope display. Players used knobs to control a dot representing the ball on a rudimentary tennis court. The computer did all the calculations on the trajectory of the ball, from one side of the "court" to the other, projecting the primitive graphics on an oscilloscope.

This innovation at a three-day scientific exhibition is considered a significant milestone in video game history, paving the way for future recreational electronic games.



Spacewar! (1962)

The PDP-1 was a milestone computer for its era, offering users and especially academics and students at universities such as MIT, the opportunity to develop programs for it. Unexpectedly for the creators of the computer, Steve Russel, then at MIT, in collaboration with his peers, decided to create a video game that mimicked real physics, resulting in the development of an ultra-hard early “shooter” game, that could be controlled using joystick, and with graphics displayed on a vector screen. In Spacewar!, users controlled two triangular spaceships that could be maneuvered around the screen, while avoiding asteroids. They had to constantly rotate their ships and shoot torpedoes in order to hit the “enemy”.

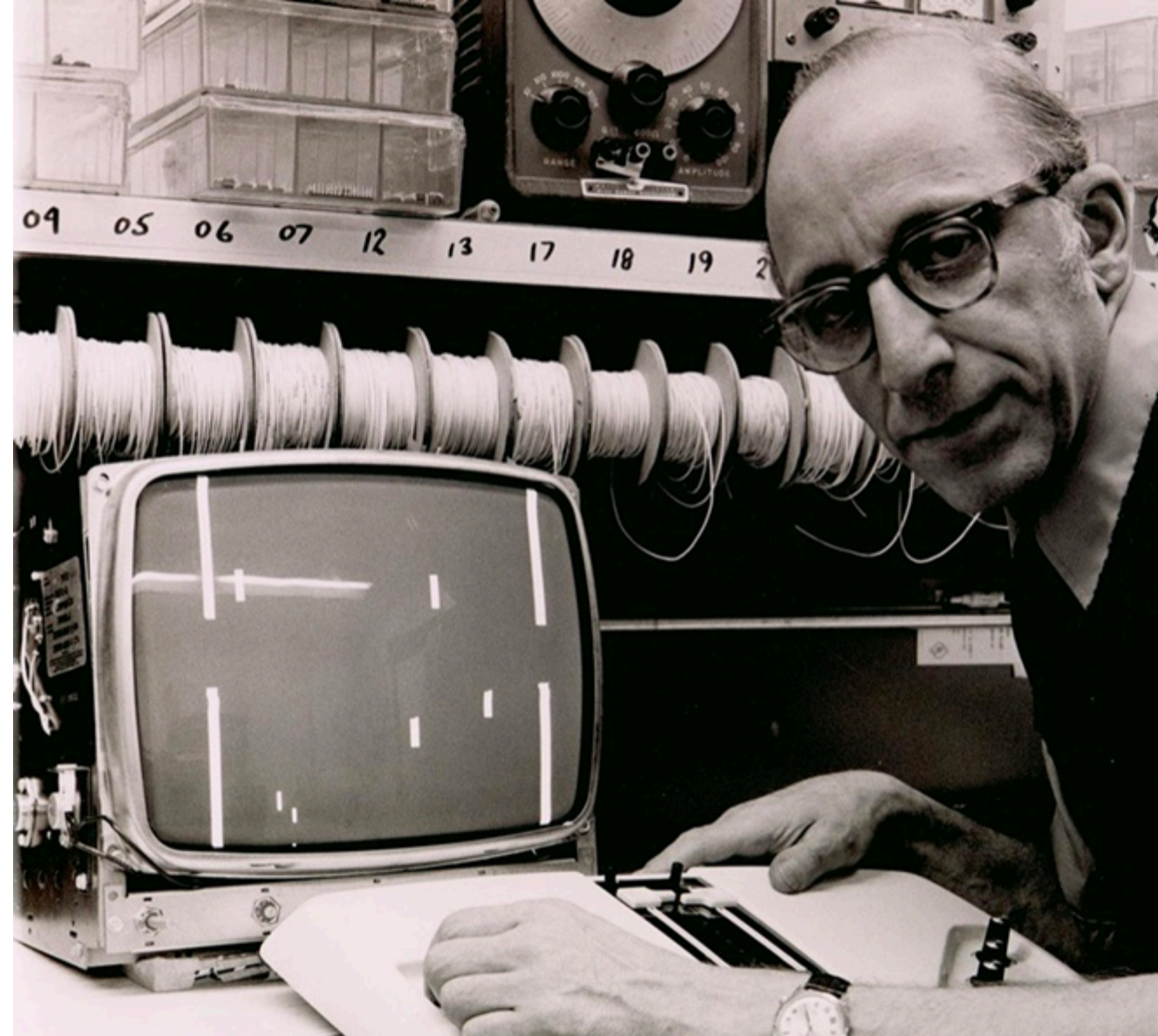
Spacewar! was an instant sensation, causing other academic institutions to recreate the game, and the parent company of the PDP-1 to even include it as a demo of the capabilities of their computer.



Brown Box (1967)

Ralph Baer was busy working on his grand vision, to create something new, something unheard of just a few years ago: a way to control images on a domestic TV, in a playful manner. The idea struck him just 15 years ago, while working at an electronics company in New York. It was there that he fatefully, or accidentally, discovered that he could generate and control an image signal on a TV screen.

It wasn't until he joined Sanders Associates, and another decade-and-a-half passed, before he could convince his fellow engineers he was now overseeing, to work on his dream project: create a prototype device that could actually project solid images on screen and control them, in such a way, that you could actually make a playable game with it. Once Ralph, Bill Harrison and Bill Rusch displayed the first images they could control using two dials, soldered on a board, connected in turn to a TV, they realised they had created something completely new,



unique and innovative! Little did they realise that they just started a multi-billion dollar industry! News soon erupted all over the company, and lines of curious coworkers scrambled to have a go at the machine. They soon used nice tape to wrap their invention, giving the look of a wooden box. And thus, the name was selected: "Brown Box", credited, and rightly so, to Ralph Baer as the inventor of what would later be called "the video game".

Computer Space (1971)

Nolan Bushnel and Ted Dabney, decided to port the game "Spacewar!" to the -then- relatively cheap Data General Nova computer. However, they soon found out that the computer was not powerful enough to handle the game. After thinking about quitting entirely, they came up with the idea of designing an inexpensive custom system, capable of only running one game. They then formed their own company, 'Syzygy Engineering' to create the system.

Nolan Bushnel was the main designer of the game, while Nutting Associates was the company funding the creation of the cabinets. Each cabinet of Computer Space resembled a very futuristic -for its time- design, with a screen displaying the monochrome bitmap graphics, while a set of controls on the lower part of the chassis, enabled the players to control the action.

Eventually, the cabinet and the game sold more than 1000 units, making a good return-of-investment and it was followed almost two years later with a two-player version.

One of the main complaints of players, and one of the main reasons it was not met with more sales, were the complex controls: the players could not understand the game easily, and thus the average person found in a bar or in an arcade, was not interested in it.

This first foray into the digital entertainment market, would lead Bushnel to rename his company 'Atari', and create his first huge success, with Pong.



In this chapter...

In **Chapter 1** we were introduced to the earliest concept of digital games, starting with Turochamp, envisioned by Alan Turing, but never materialised (by him), because of the limitations of the computer technology before his (untimely) death. Others used more advanced computers, as they were progressing, to create the first interactive games, including a tennis game for two players, Tic-Tac-Toe and even a space fighting, genre defining game. During the late 1960s, the vision for the first home console was formed, and the first arcade machine based on a digital game was created. The end of the 1960s and the early 1970s will mark the beginning of a whole new entertainment and educational market, worth billions...

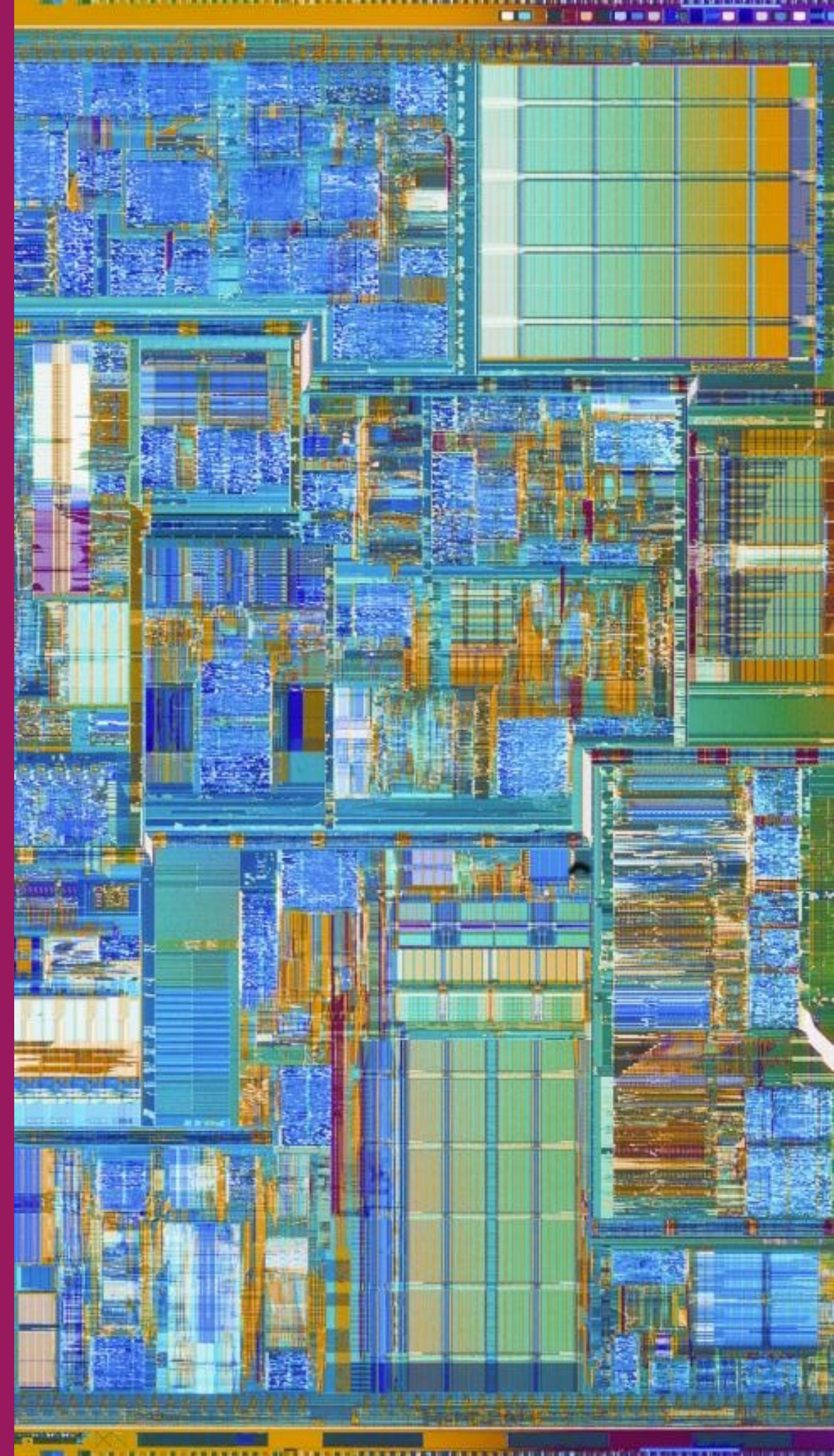


Part B: The First Generation

Birth of a new industry

After years of trying to convince companies to develop his invention, Ralph Baer managed to convince Magnavox to embrace his vision. Soon, the Odyssey was in the market, inspiring others to create derivative products. Pong was one of the most important “clones”, leading to court battles, and opening up the video games industry for more companies to join, while propelling Atari -a new company- to incredible heights.

The development of the first “mainstream” CPUs such as the Intel 4004, and later the 8008, and similar offerings from other companies, will create a roller-coaster effect that will bring -at long last- the first personal computers in the homes of thousands of people. Soon, Apple, Commodore, Radio Shack will start developing the first personal computers in the US, while companies such as Sinclair will create the first inexpensive computer in Europe. The revolution is about to begin, taking the world by storm in unprecedented ways...



• Chapter 2 •

Central Processing Unit

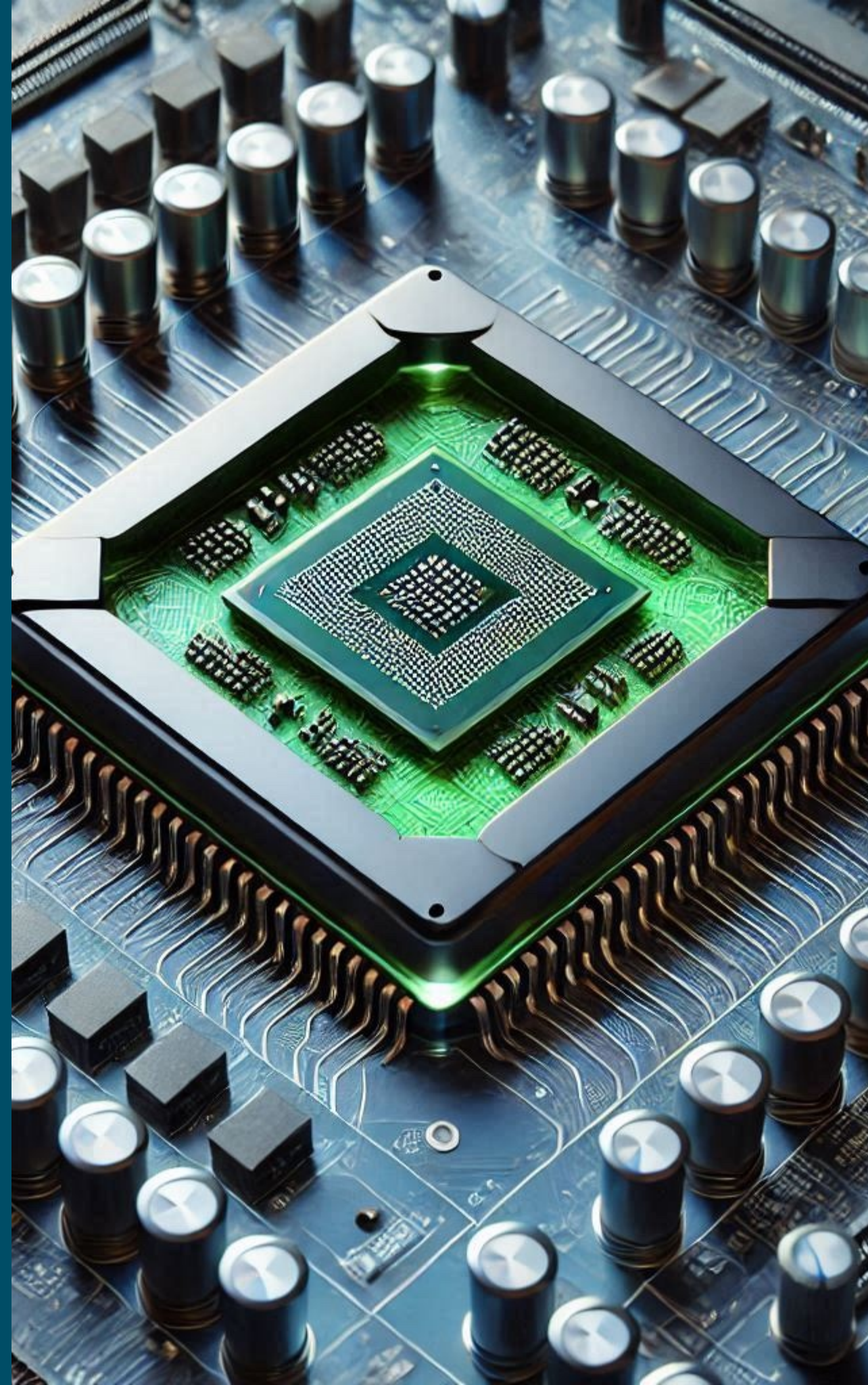
Sometimes it takes brains to function

"...they were called The Traitorous Eight"

Introduction

The history of personal computers, and in a large degree, video game consoles -at least from the second generation onwards- is based on a single development: the microprocessor. What began at Intel, after a huge order from a calculator company, soon became a global race, with companies competing on bringing the latest and greatest to the market first. Starting with the humble Intel 4004, the first generation of microprocessors powered the machines that served thousands, if not millions, until the early 1990s.

In the pages that follow, we cover the most important microprocessors from companies such as Intel, Zilog and MOS Technologies, that will power the vast majority of personal computers and video game consoles for another two decades.



Fairchild

As is often the case in a rapidly changing industry, the electronics business was blooming in the late 1950s. A group of engineers working at Shockley Semiconductor Laboratory, disillusioned by the style of their manager, William Shockley, decided to create their own company. They were soon called “the Traitorous Eight”, and included such names as Julius Blank, Victor Grinich, Jean Hoerni, Eugene Kleiner, Jay Last, Gordon Moore, Robert Noyce, and Sheldon Roberts. They soon found capital to create their own company, named Fairchild Semiconductor, creating revolutionary technologies, including a process for creating cheaper and more reliable silicon transistors, the foundation of the computer era.

Some of the core founders of Fairchild Semiconductor would later leave the company to create their own, including Intel, formed by Gordon Moore and Robert Noyce. Fairchild would remain significant and innovative in the industry for years to come, as we cover later in this book.



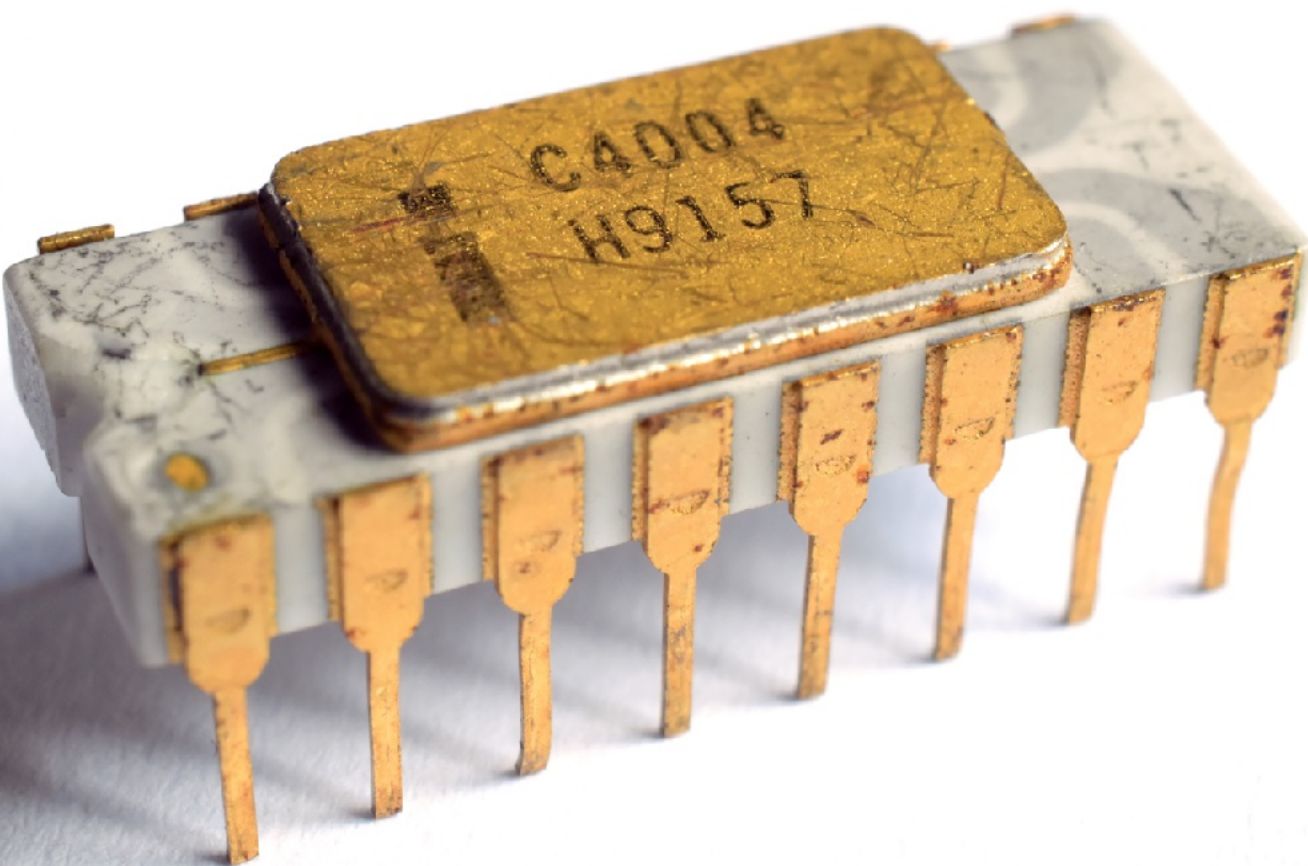
The marker at the first offices of Fairchild Semiconductor (source: Wikipedia)

4004

In 1969, Nippon Calculating Machine Corporation, asked Intel to design a set of integrated circuits for its new line of calculators. Intel's engineers, however, soon realised that they could create a single general purpose custom chip for all the functions of the calculator. This new general-

purpose chip (a microprocessor) could handle all the different tasks through software programming.

The result of this ground breaking idea was the Intel 4004, the first commercial microprocessor, released in 1971. It was a 4-bit chip, operating at a clock speed of 0.7 MHz, capable of performing 90 000 operations per second, featuring more than 2000 transistors into one silicon die. Even though -initially- Intel could not realise the full potential of their invention, other companies -including hobbyists- realised just what exactly the 4004 could prove to be, launching an entirely new category of products. Soon, Intel developed more advanced chips like the 8008 and 8080, powering and inspiring an entire industry.



6800

In 1974, Tom Bennett, Chuck Peddle, and Bill Mensch, working at Motorola, create a new 8-bit microprocessor, the 6800. It was developed to compete with Intel's 8080 and to offer an accessible, cost-effective solution for the emerging world of embedded systems and personal computers.

The 6800 was very powerful for its time, offering an 8-bit architecture and supporting a 16-bit address bus. It was capable of addressing 64KB of RAM, which was considered quite significant in the early 1970s. It was released to the market for less than \$200, undercutting the cost of the Intel 8080 microprocessor, while offering a series of support chips that allowed the development of complete systems at significantly reduced costs, compared to the competition.

Chuck Peddle, wanting to create an innovative and yet affordable by everyone microprocessor, would soon leave the company to pursue his own vision. However, the 6800

would continue to exist and power more machines, while offering the foundations for the development of more powerful microprocessors, including the 68000 family, that would power the 16-bit generation of personal computers, starting with the Apple Lisa and Macintosh, and including computers from other companies such as the Atari ST and Commodore Amiga. The final line of the 68000 found in personal computers and workstations was the 68040, in the last models of the Apple Macintosh range, and the NeXT computers, before the migration to RISC microprocessors.



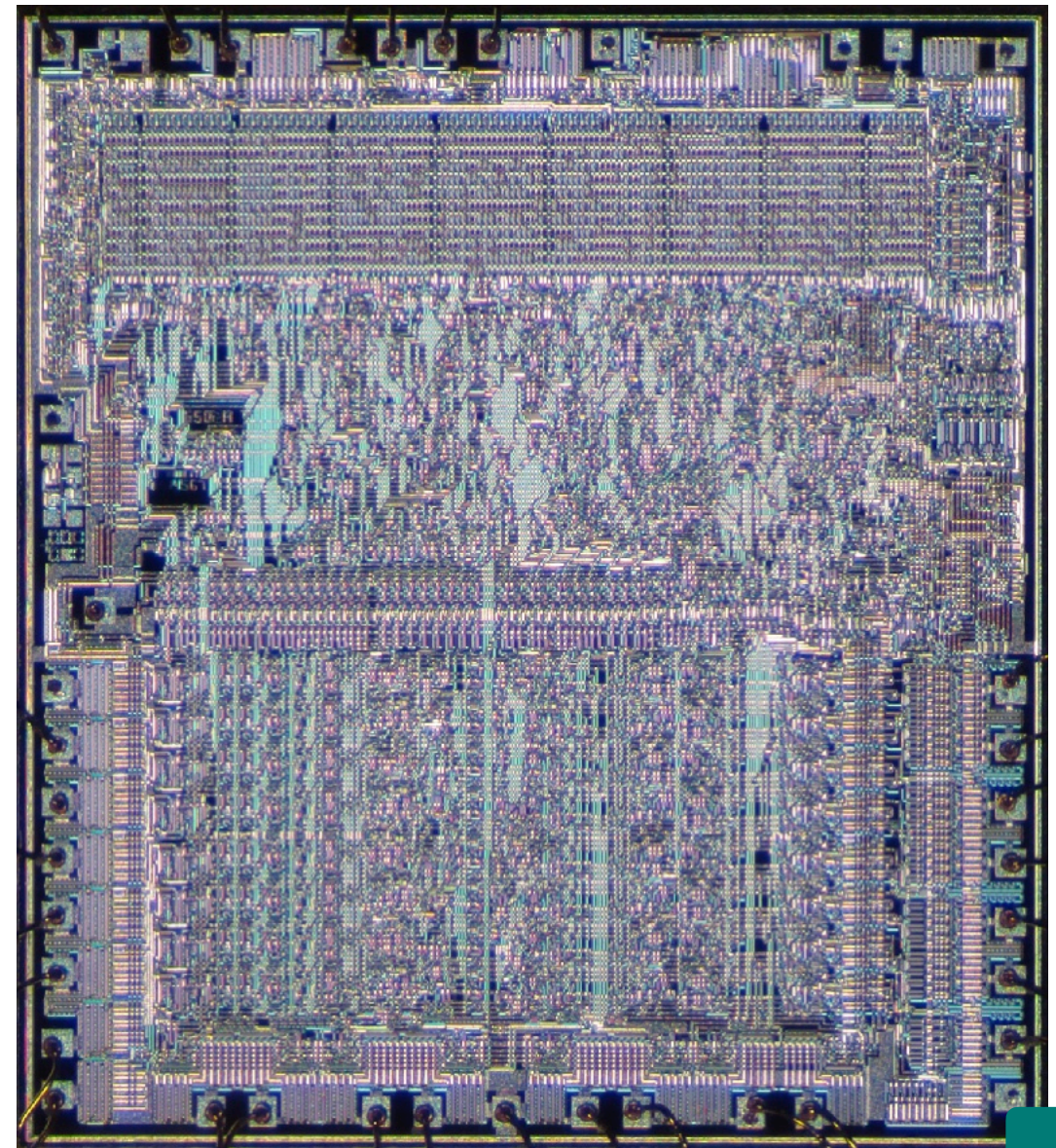
6502

Chuck Peddle knew what the industry wanted: an incredibly inexpensive CPU that could power a multitude of devices, at a fraction of the price of the competition (Motorola and Intel, to name just two). So he set his sights high with a group of dedicated and like-minded engineers, as they left the safety of their company to pursue their dream. And in what must be an engineering miracle, they managed to design a prototype in a fraction of the time, and at a fraction of the cost of everyone else in the market. In fact, at least one author claims in a book ("On the Edge") that they got it "right" from the first go.

Regardless of how things transpired between vision and first implementation, they did manage to find a company -MOS Technology- to create the chips. And how would they sell them? They decided to break new ground again and instead of spending ages promoting their new chip with press releases, they attended the WESCON trade show in San Francisco, in 1975, carrying with them jars full

of the chip. But, there was a small catch: the jars only contained some working chips, and they were filled (the bottom half) with defective ones, to make them look as if they had a huge production going on!

The 6502 itself was selling for an incredibly low \$25, making it hugely affordable to almost anyone. And one of the early purchasers was a young guy named Steve Wozniak, who was interested in creating his own little

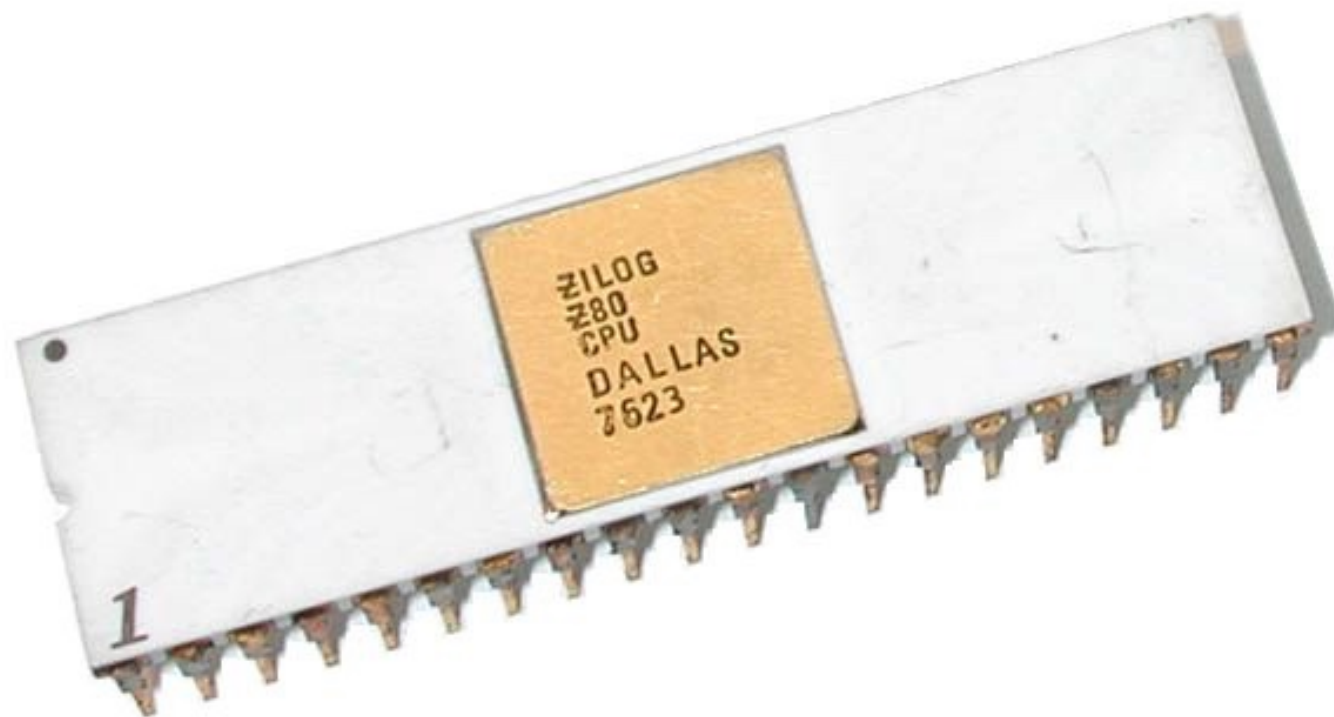


Z80

Federico Faggin was one of the creators of the Intel 4004 and 8080 microprocessors. He was soon pursuing his own vision, and in 1976, his company, Zilog, introduced the Z80 microprocessor. Similarly to what Chuck Peddle trying to achieve with the ill-fated 6501, the Z80 was backward compatible with the Intel 8080, a popular -but expensive- microprocessor at the time. But this time, Faggin managed to create a backward compatible, powerful, inexpensive processor that did not share the legal problems of the 6501.

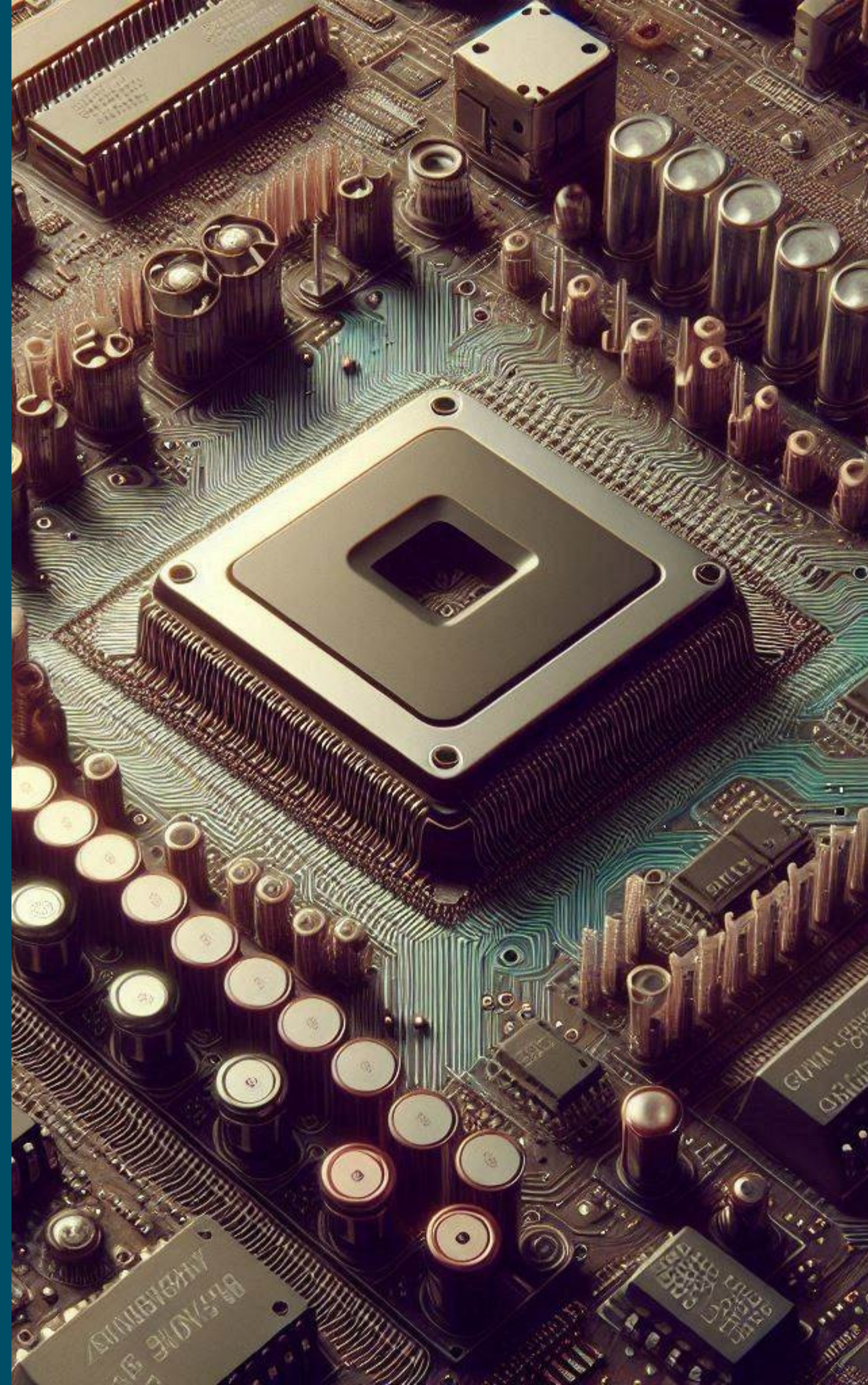
The Z80 proved to be an immediate success, thanks to its powerful, inexpensive design, proving even more capable than the Intel 8080. Zilog initiated an aggressive marketing campaign, even offering upgrade paths to systems using the Intel 8080. To complement their product, they released tools and documentation that allowed engineers to learn how to use the Z80 almost immediately. The first generation of 8-bit computers, destined for personal or home use, would soon be split between the MOS 6502

and the Z80 - at least until the arrival of the first IBM PC, in the early 1980s. Computers such as the ZX80, ZX81, Spectrum, and the entire Color Personal Computer of Amstrad would be built around them, including a series of video game consoles. But that is a story for later...



In this chapter...

The home video game console was envisioned in the late 1960s by Ralph "The Inventor" Baer. His dream would soon become a reality, albeit not a very successful (commercially) one. But the real revolution that will bring personal computers to the masses -and evolve the video game console beyond the wildest dreams of Baer- only happened after the microprocessor came to being. The Intel 4004 was the first of its kind, but the one that truly revolutionised the "home" (or personal) computer world was none other than the ultra-affordable MOS 6502. The revolution is about to erupt, and it will take the world by storm!



• Chapter 3 •

The First Generation

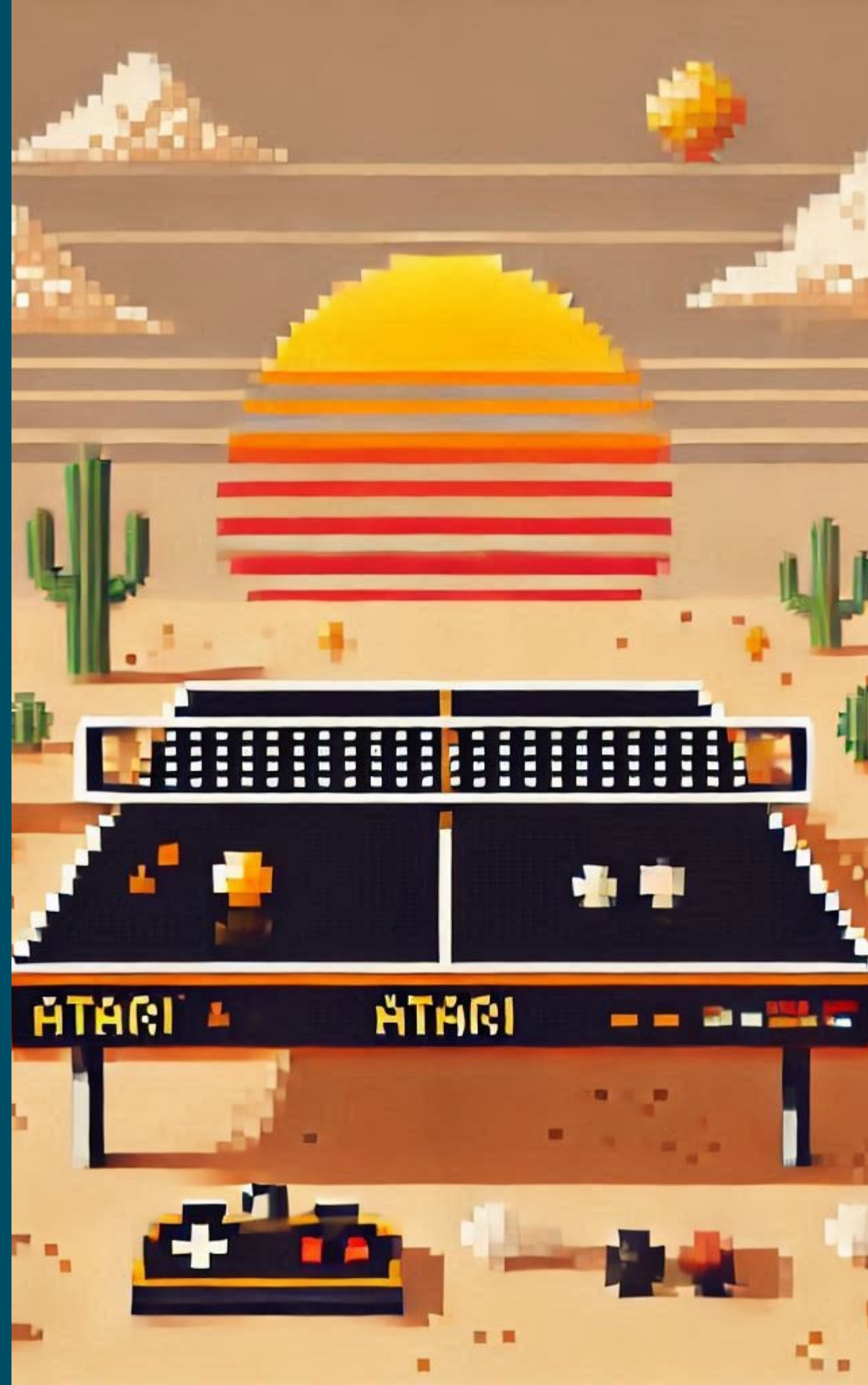
"...can you reduce the number of chips on the board?"
(Atari to Steve Jobs for the board of "Breakout")

Introduction

The first generation of consoles were defined by the use of dedicated hardware to play a single, built-in game, or variants of the same game. They were introduced in 1972 with the first commercial game console, the Magnavox Odyssey, and their games usually supported few -if not black and white- graphics. These systems were mostly derivatives of the first Odyssey games, or the more advanced Pong by Atari.

Interest in the first-generation game consoles helped launch an entirely new industry that allowed all the innovations that eventually happened, to occur, within the course of a few years.

In this chapter we take a look at the most significant consoles of the first generation, and their impact on the industry.



Magnavox

Ralph Baer tried to convince companies for years to create a new product, one that could use a domestic television to display -and control- entertainment. At long last, Baer "The Inventor" managed to convince Magnavox, an established company better known for their TV sets, to create and market his invention. At the time, every home had just one (black and white) TV set, therefore the console would be at the forefront of family entertainment.

In 1972, the Magnavox Odyssey was released, a revolutionary product for its time, offering basic graphics and no sound. However, the very concept of controlling the "action" on the TV screen was unheard of at the time, and it caused quite a sensation, that would soon create a multi-billion dollar market (but, regrettably, others would reap the rewards for that).

Magnavox used its extensive network of partners, already selling its TV sets, to promote the new product. By aggressively marketing the new console, they managed to

create sales that turned the Odyssey into a profitable product, paving the way for the new industry.

Since the first console could not support audio, and it relied on "cards" to play variations of the same game, Magnavox included color overlays for the TV. These overlays gave the impression of background graphics, adding to the illusion of different types of games. In fact, Magnavox claimed that its console included 12 different games, such as tennis, shooting gallery -with the purchase of an additional shooting gun- chase games and more. These were very simplistic for its time, controlled using the rotational knobs of its controllers.

The Magnavox TV Confusion

Magnavox was an established TV maker, with a significant penetration in the US market. However, this had a negative effect on the sales of the Odyssey: mistakenly, people believed that the Odyssey only worked on Magnavox TV sets, leading to lost sales!

Magnavox Odyssey

The Odyssey, released in 1972, is considered the first commercial video game console, that led to an avalanche of more advanced systems from other manufacturers, which would subsequently licence the design and games from Magnavox.

To add more value to the console, or so the marketing department of Magnavox thought, they included a series of other items, unrelated to the the onscreen "action", in



the form of dices, cards, money and casino chips. Since the machine did not support sound or a scoring system, players had to rely on make-belief (for the graphics), helped by the color overlays, and also to use standard notepads for tracking the score on competitive games.

The crude graphics were produced by clever engineering, and did not use a dedicated microprocessor, like the consoles that would come much later!



Fun Facts:

The world's first commercial video game console!
Inspired an entire industry that would -initially- licence its technology.
Help establish Atari as a new rising star of the industry.
Enable Nintendo to create its first console.!

Lightgun, by Nintendo

The Odyssey had an optional rifle that could be used with a variety of shooting games. These were crude and not very accurate, however they were (among) industry-first!

Ralph Baer and his team created the rifle years before the release of the actual Odyssey console. However, they realised they had to partner with another company that could create the electronics and mass produce it as a separate (add-on) product. Fortunately for Magnavox, Nintendo, a Japanese company making its first forays into TV-based gaming, had released its own rifle in 1970. Even though the Nintendo product used a different method of recognising the targets, the experience of its engineers (and a little help from Sharp), enabled the development of the final product. Magnavox, after licensing the rifle, began developing a series of games to accompany its peripheral, adding more value to its product. The rifle was one of the sensations of the Magnavox, especially in the early 1970s.

Optional ODYSSEY Shooting Gallery



... offers you an exciting new dimension in the enjoyment of your ODYSSEY. The SHOOTING GALLERY, model 1TL950, includes an ELECTRONIC RIFLE, two Printed Circuit Game Cards and 4 different Target Overlays in two sizes. The total unit offers 6 variations for creating your own home shooting gallery. **\$24⁹⁵**



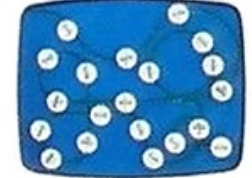
SHOOTOUT



SHOOTING GALLERY



PREHISTORIC SAFARI



DOGFIGHT

Other Optional ODYSSEY Games...

are available, too ... and at a very modest price—only \$5.95 each! Once you've tried ODYSSEY, you'll want to have *every exciting* game offered. Here are additional games that will bring you and your family great fun and hours of entertainment. Complete instructions, as well as game aids are included with each.



VOLLEYBALL (1TL702). A demanding game of your electronic coordination as you try to smash the ball over the net and out of your opponent's reach.



INVASION (1TL801). Try to capture all opposing enemy castles. You launch your assault by land or sea, but must strategically protect your castles during the battle. Includes Treasure Loot cards, game board, army tokens and dice.



FUN ZOO (1TL900). Youngsters will have fun at the Zoo as they read the game cards and follow the paths to the correct animal's cage, or stop at the snack shop. 28 Fun Zoo cards are also included.



BASEBALL (1TL700). Select your team and plan your batting line-up. You are the manager, so lead your team and plan the game strategy. Includes play cards, scoreboard, runner tokens, and dice.



HANDBALL (1TL701). The electronic version of handball that challenges your responses and reactions in a fast-moving game.



WIPEOUT (1TL800). Advance your car along the game board as you complete your laps. You must be fast, but also accurate, as you are timed and penalized by the timer light. Includes game board, car tokens and pit stop cards also.

Pong

Nolan Bushnell, after the commercial failure of Computer Space, decided to persist in his vision of digital entertainment. After participating in a demonstration of the Odyssey, by Ralph Baer, he was inspired to create his own version, albeit for a coin-operated machine. With the help of Al Alcorn, Bushnell created a new video game system, called "Pong". It was very simple, and it required two players to control a (square) ball and try to outmatch the other. The system featured two paddles that allowed their "racket" to be moved vertically across each part of the screen (left or right), trying to score a hit on the other player's side.

Even though the game was a far departure from previous titles, including those for Magnavox Odyssey, it still relied on analog components to function. It soon met with incredible commercial success, leading Bushnell to establish his own company, "Atari".



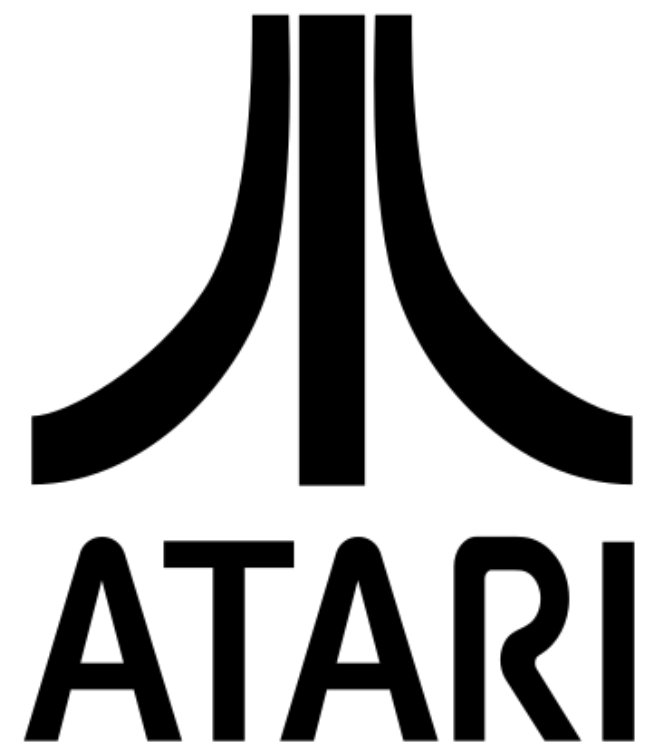
The Andy Capps Malfunction

The first Pong cabinet was placed in the Andy Capps tavern, for testing purposes. Al Alcorn was called to fix the machine, since it broke down and customers were complaining. To his surprise, the reason of the malfunction was the huge number of coins inserted in the machine!

Atari

The success of the coin-operated Pong machine, convinced Nolan Bushnell and his partner, Ted Dabney, to establish their own company. Initially, they wanted to call their company "Syzygy", but since that name was not available, they picked the name "Atari", a term derived from the Japanese game "Go", with a meaning similar to "check" in Chess.

The success of Pong, left the two founders of Atari with a dilemma: would they break out of their contracts with Nutty Associates and Bally, or would they keep the rights to the rising profits of a new industry for themselves? By clever stalling and manipulation, and with their financiers unable to understand the potential of the new video game cabinets, the two partners managed to retain ownership of their product, and they soon incorporated their company and started releasing new video games for coin-operated cabinets.



Not content with being developers of coin-operated machines, they would soon disrupt the industry and create an entirely new industry, one that was left for them to fashion as they pleased, because of the mistakes of Magnavox, and its unwillingness to really invest in the Odyssey.

In 1973, Ted Dabney would drop out of Atari, leaving Nolan Bushnell in complete control of the company. In 1974, Nolan Bushnell decided that it was time to release a home version of Pong.

Legal troubles with Magnavox

Nolan Bushnell tried to claim that got his inspiration from "Tennis for Two". However, it was found that he had attended a Magnavox demonstration, and had to pay royalties. However, that was only a tiny fraction of the profits Atari would soon make from other products...

Home Pong

In 1974, Nolan Bushnell decided that the time was right for a home version of Pong. Al Alcorn was once again the main engineer behind the console, delivering some clever engineering to produce a machine with a small footprint that could be used with a domestic TV set.

However, Atari was not in a financial position to create and distribute the machine on its own, and it struggled to find a business partner.

Sears, the large chain of department stores, was the only (large) company interested in the distribution of the machine, and it began with an order of 150 000 units for the Christmas period of 1975. The machine was marketed and sold as “Sears Tele-Games Pong”, at a very affordable price of \$99. The console met with such a huge success, that it established Atari as a serious creator of home video game consoles, opening the doors for the company to become one of the fastest growing technology companies in the world.



Soon, other companies will mimic the success of the Home Pong console and release their own clones, flooding the market and opening the road for more innovation.

Sears, Pong, and the Sports section

In 1975, there was no “video game” market, even though Magnavox Odyssey was released 3 years before the Pong console. Sears was left with a dilemma: it had the stores but it had no idea where to place the console. They finally decided that Pong was a sports game, therefore earning a place at the sports section of its stores!



The Pong Phenomenon

Home Pong was definitely not the first commercial video game console for home use, but it was the first that met huge commercial success, spawning many competitors and copy-cats, and in some cases some real innovation. It is still enjoyed today, albeit in a more “nostalgia” related role.

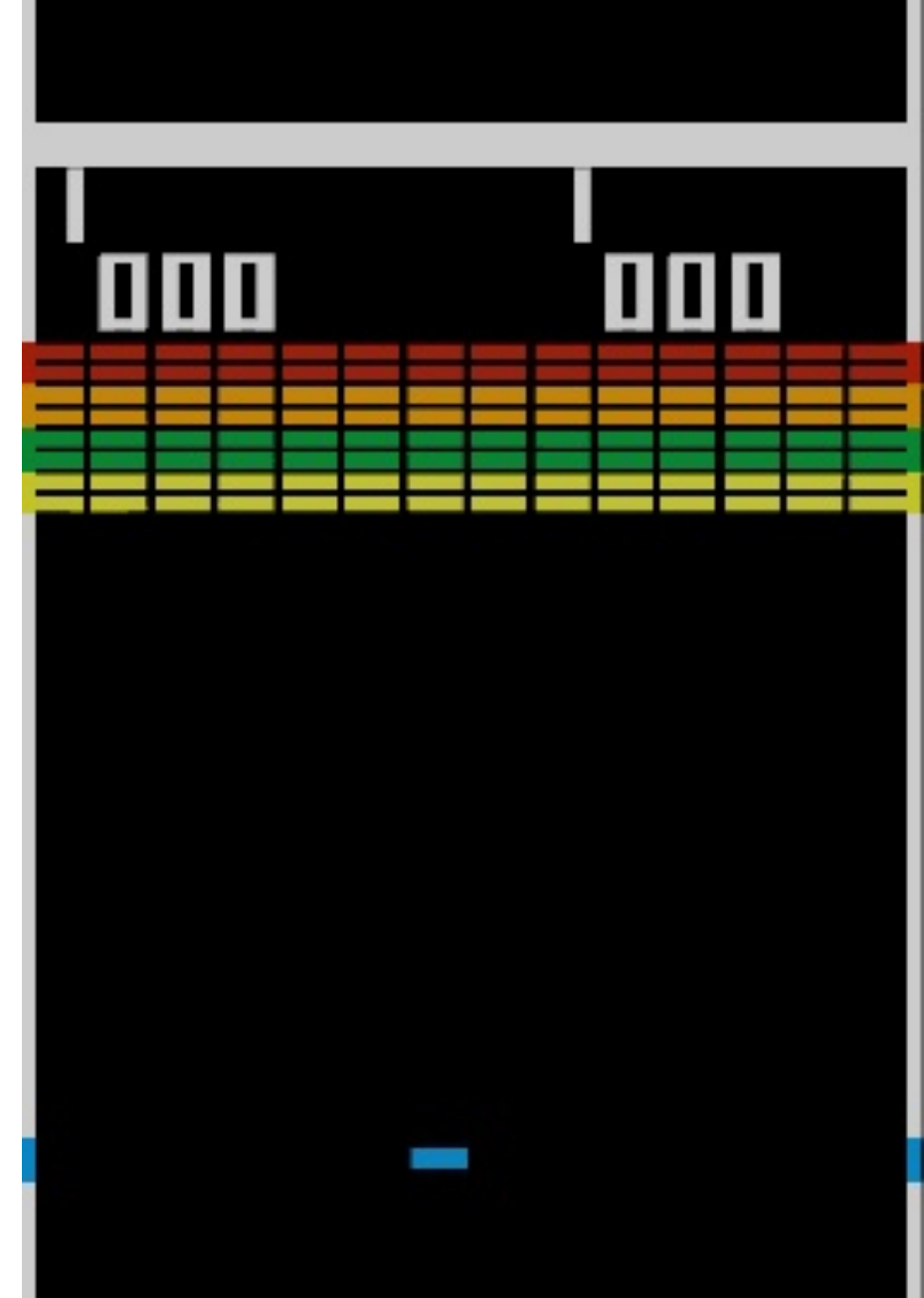
Photo: Shadowgate - <https://www.flickr.com/photos/shadowgate/35522359383/>

Breakout

In 1976, one of the most influential video games of all time, Breakout, was released by Atari. Developed by Nolan Bushnell and Steve Bristow, it was inspired by the earlier game Pong, but with a clever twist: the player controlled a paddle at the bottom of the screen to bounce a ball, aiming to break all the tiles (or bricks) at the top. Unlike Pong, which featured two paddles, Breakout offered a single-player experience. The gameplay was simple yet addictive: players needed to strategically bounce the ball to destroy the wall of bricks, with each hit earning points. If the ball was missed, the player lost a life.

The game's graphics were initially basic, with colors created by colored overlays embedded inside the coin-operated arcade cabinets. Despite the simplicity of the design, Breakout became a commercial success, captivating players with its innovative mechanics and straightforward challenge. Its popularity was so high that Atari struggled to meet demand, marking the game as a major milestone in the video game industry.

Unable to meet the rising demand for video games in Japan, Namco, a former Atari partner, created its own clone of the game, becoming a major player in the video games industry.



Atari and the two Steves

Famously, Steve Jobs worked at Atari during the nights, as a game developer. At the time, the Breakout circuits were too complex, and Atari asked Steve Jobs to simplify the design. Unable to do it on his own, he tricked Steve Wozniak to improve on the design, lying to him about the amount of money they would get from Atari. Even though Wozniak managed to complete the project, his solution was deemed too complex to manufacture, and Atari never used his design.

Coleco Telstar

In 1976, Coleco decided to jump on the bandwagon of the Pong revolution, by releasing the Telstar, a Pong variant that was created around the General Instrument AY-3-8500 chip. Whereas other Pong home consoles relied on several components to function, the Telstar only used a fraction of the number of chips of the competition, allowing the company to sell its console at a very affordable price, ensuring an almost overnight success.

Coleco was not content with the success of its Telstar console. It soon released other console series to complement its product, adding more features at reduced prices.

The Telstar Ranger followed the success of the Nintendo Shooting gun for the Magnavox



Odyssey, and added similar functionality, while the Telstar Arcade (image bottom) featured a wheel and a lightgun.

By 1977, Coleco had managed to sell more than 1 million consoles, turning the company into a recognised and well-accepted household name for video entertainment. However, the release of dozens of Pong clones and variants from many companies, in the late 1970s, led to a high saturation of the market and

a loss of interest from the users. This, along with the coming of a new generation of consoles, contributed to the demise of the Telstar series.



COLOR TV-GAME

The experience of working with Magnavox on the Odyssey, as well as the commercial success of Pong, captured the attention of Nintendo of Japan. Hiroshi Yamauchi, then president of Nintendo, decided to move away from the traditional games manufactured by his company, and enter the video games market. To avoid any litigation problems, following the lawsuits between Magnavox and Atari, he decided to licence the rights for a new console they called Color TV-Game 6, followed by Color TV-Game 15.

These early Nintendo consoles were manufactured by Mitsubishi and the first model, the TV-Game 6 (image

below left) was released on June 1, **1977** in Japan. The number six stands for the six variations of Pong that were built-in the console. To control the game, two dials were integrated on the main (plastic) unit, one on the left and one on the right. Switches enabled players to change the game, essentially providing minor adjustments to the same core graphics.

The Color TV-Game 15 was released shortly after the first version, and contained 15 games. It also had detachable controllers, offering more flexibility to the players.



Racing Wheel

In 1978, Nintendo released their biggest system yet, the Color TV Game Racing 112. It had an embedded wheel, and a racing game that was a near clone to Speed Race, released 4 years earlier by Taito.



To provide two player support, the game featured detachable controllers that replaced the steering wheel when controlling two vehicles (one on the left and one on the right of the screen) at the same time.

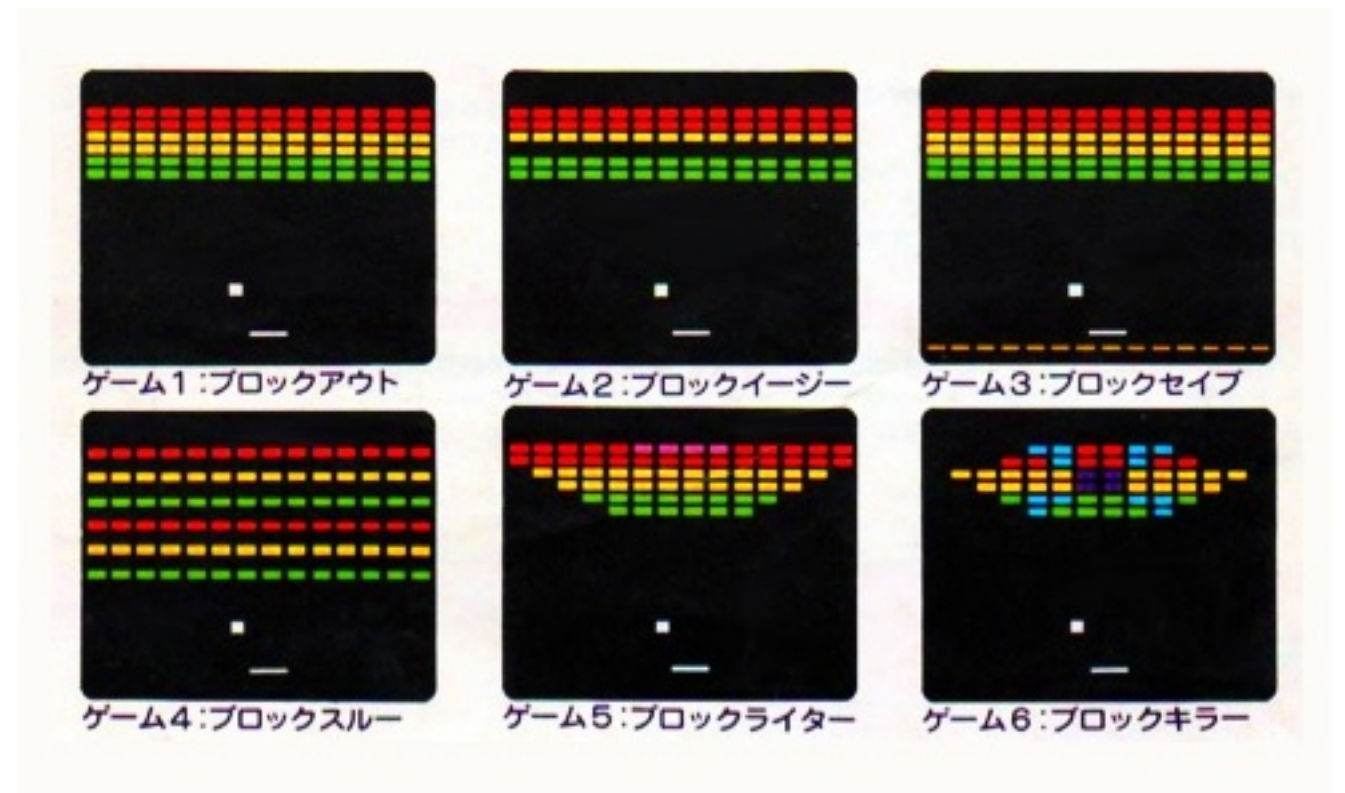
The graphics were very rudimentary, and they reminded the game of Pong, with a line in the center and the score appearing on the top left and top right of the screen. Soon, Nintendo would outdo itself with its next console, created by a new rising star named **Shigeru Miyamoto**...

Block Kusuzhi

Atari met with huge success, upon the release of the Breakout game. In Japan, Namco managed to reap all the rewards with its own clone of the game.

When Nintendo saw the huge success of Breakout, decided to create their own version for a new console. This time, Nintendo was designing and creating the console themselves, allowing the company to have complete control over every aspect of its creation. And the designer of the new console was none other than Shigeru Miyamoto, a promising young designer who would very soon change the entire landscape and history of video games..

The console, named Color TV Game Block Kusuzhi, was released in **1979** and, like previous machines, included multiple (six in total) variations of the same game, essentially a clone of Breakout.



The player used the rotating dial of the embedded paddle to control a horizontally-moving racket, while trying to bounce a (square) ball to the uppermost part of the screen, destroying the various levels of colored blocks.

The game proved a huge commercial success for Nintendo, giving rise to the star of Shigeru Miyamoto who would later go to create more games for the company.

It also allowed Nintendo to create its final TV Game console.



Computer TV Game

By the time the Computer TV Game was released, the entire market was shifting to consoles that could use cartridges to play a variety of games. Up to that point, most consoles relied on embedded games which were usually variations of the same. However, with the advent of the Fairchild Channel F, and the Atari VCS line, the benefits of using cartridges -and developing games for them- became apparent to both the industry and the users.

Nintendo realised the need to move to a new direction. However, they created the last member of the TV Game series, naming it Computer TV Game. The name resembled both a continuation of the line started with the TV-Game 6, as well as the realisation that the market was moving to new technologies which were more sophisticated and much more versatile.

Shigeru Miyamoto was asked again to create the chassis for the new console. He designed a very elegant white case, that contained the circuitry and the included games.



Instead of paddles with rotating dials, the new console only included directional buttons that allowed movement of objects on the screen. In Othello, players take turns as they move their objects (squares or crosses) on an 8x8 board.



In this chapter...

In Chapter 3 we learned about the first generation of video game consoles. Starting with the revolutionary Magnavox Odyssey, very quickly the competition managed to catch-up and release a multitude of different systems, that had very similar characteristics and played equally similar games - derivatives of the same “ping-pong” style of play, popularised by Magnavox.

Atari took its first steps into creating a video game console for home, attracting the fury of Magnavox. Nintendo made its first foray into the world of video game consoles, licensing the technology from Magnavox. Many companies released their own products, all running with games integrated into the system. But soon they would be eclipsed by systems running different games from an external source, the cartridge!



• Chapter 4 •

The Second Generation

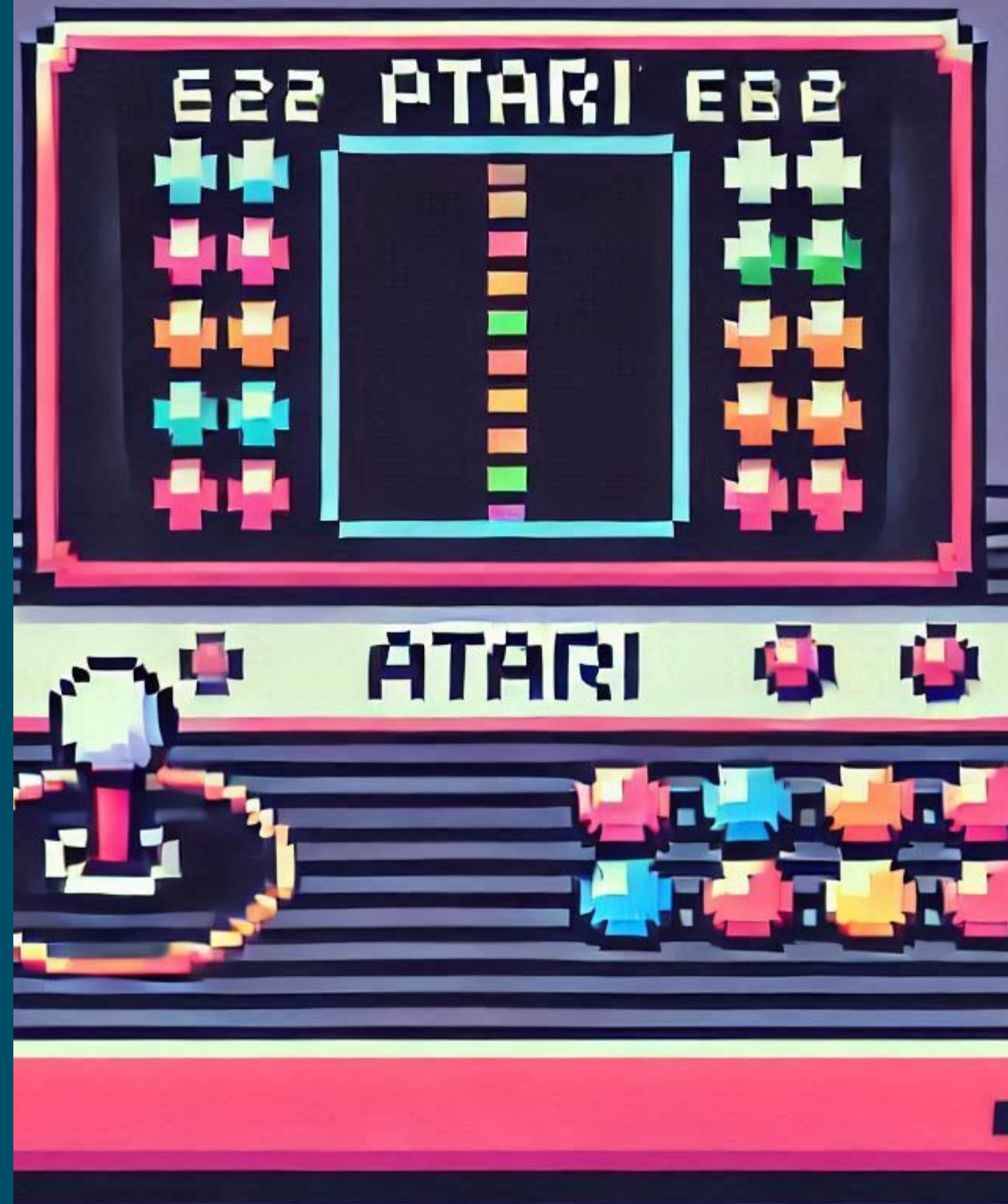
"There's no way anybody could have predicted
how fast this industry would take off"

Ralph H. Baer "The Inventor"

Introduction

The second generation of video game consoles (1975 to early 1980) is characterised by an adoption of microprocessors, enabling them to offer vastly superior graphics and sound capabilities. New types of controllers are introduced, to take advantage of the new games developed for the more advanced systems. Where the games were previously built into the systems, now cartridges are used to store the software, enabling gamers to create a library of innovative and diverse types of games.

The separation of the software from the hardware, allowed the industry to expand and many companies were created to develop games for the consoles. However, the rise of software development with very low quality games, will lead -eventually- to the video game crash of 1983, from which many companies will never recover.



CHANNEL

In **1976**, an engineer at Fairchild, named **Jerry Lawson**, managed to convince the company to create a new video game console that would far surpass the capabilities of every other machine in the market. Up to that point, all video game systems, both coin-operated and for home use, relied on embedded games that offered variations of the same theme. The competition had no or very basic sound, while the graphics of the home consoles were black and white.

The Fairchild Channel F was a revolutionary product for its time, since it was based -a first for any video game system- on a microprocessor (the Z80 was chosen) that allowed the entire system to play any type of game, as long as it could be loaded into the system. Embedded in the system were Pong variations, however, the console had another huge advantage over the competition: it could load games from external cartridges, that could be programmed to depict entirely different types of games. This was a huge



revolution to the established model of one console with fixed games of a very specific type, and it single-handedly set the foundation for the creation of a video games industry. Up to that point, all video games were developed to be included with a console, tying the software to the hardware. For the first time, the software was unchained from the hardware.

Another important aspect of the Channel F console were the controllers: they used two analog sticks to control 360 degrees of movement, offering tremendous freedom of control to the player.

The Legacy...

Although the **Fairchild Channel F** did not achieve significant commercial success compared to later consoles, its innovations had a lasting impact on the industry. By introducing the concept of interchangeable cartridges, the Channel F helped pave the way for future consoles, and its controller design influenced the development of more sophisticated input devices. The console's release set the stage for the development of the home gaming market, and while it was eventually overshadowed by the success of other systems, it remains a key figure in the history of video gaming. **Jerry Lawson**'s contributions to the creation of the Channel F have earned him recognition as one of the early pioneers of the video game industry. Some of his first include:

- the first video game console with a microprocessor
- the first with games stored in cartridge
- the first with analog controllers
- the first African-American video game developer.



Characteristic	Specification
Year of Release	1976
CPU	Zilog Z80
Number of Colors on Screen	4-bit (16 colors)
Number of Sound Channels	1 channel
Available Memory	128 bytes

Video Computer System

By the mid 1970s, Nolan Bushnell realised that the future of video games would rely on microprocessors and external storage devices, undercutting the costs associated with developing video game systems. Unable to fund the development of a new video game console, he sold Atari to Warner Communications, while staying at the company with a leading role.

With the financial support of Warner, Atari managed to complete and release the Video Computer System (VCS) it was designing, and later renamed as Atari 2600.

The machine was ground-breaking for its time, and even though it was not the first kid on the block to feature cartridge for reading games, it became an instant success, propelling Atari to new heights, making it one of the fastest growing technology companies on the planet. With it, Atari redefined the game controllers, with a unique new design, featuring a central controlling stick and a single button.



Furthermore, the port introduced for the controller, became an (almost) industry standard, supported by various companies across the board. The machine was also aesthetically pleasing, with the now iconic wood front panel, offering the machine a more hi-tech appealing to competitive products.

Characteristic	Specification
Year of Release	1977
CPU	MOS Technology 6507 (1.19 MHz)
Number of Colors on Screen	Up to 128 (NTSC)
Number of Sound Channels	2 channels
Available Memory	128 bytes



original
was known as "woody" and
6 switches, with two variants released- the "heavy" sixer in
1977, and its replacement, the "light" sixer in 1978 (image
top left).

In 1981, the 4-switch versions were released, and it was a
direct attempt from Atari to reduce the components, and
thus the cost, of each unit they produced. One of the most
interesting of the 4-switch models was an all black 2600,
earning it the name "Vader" (top right).

Sears created its own variants, including the Tele-Games
Video Arcade II (middle right).

In 1986, 3 years after the video game crash, Atari
released the 2600Jr, a smaller video game console
compatible with the previous consoles.



Game controllers

With the VCS line of game consoles, Atari redefined many of the characteristics of gaming, and influenced how peripherals and game development would happen, for well into the 1990s and the standardisation of the USB port.

By choosing a low-cost nine-pin connector for attaching game controllers, Atari created a de-facto standard in the industry. With the original VCS, Atari included a game controller (joystick) with the lever in the center of the box, auto-adjusting its position after release, and a single button in the left side of the unit. Additionally, for games such as Breakout, Atari released game paddles, that worked by rotating the knob on the top. This was a very important decision by Atari, since not only it redefined how players interacted with

games, but at the same time launched an industry of peripherals for use with video game consoles, and later with computers.

These ports would stay the same -and become compatible with- a wide range of computers and consoles, including the Atari 400, 800 and ST of the same company, as well as computers from other manufacturers.

It would take at least 5 years for the competition to come up with a different type of controller, that of the Nintendo Entertainment system, to offer some kind of alternative and intuitive means of controlling a video game. And even then, the joystick form that was introduced by Atari will persist into the early 90s, with hundreds of different variations by third party companies such as QuickShot.





In 1978, Magnavox released a completely new version of the Odyssey, that changed the entire internal workings of the machine, bringing it (almost) on par -and in some respects above- the current generation of consoles such as the Atari VCS.

The Odyssey 2 was based on an Intel 8048 microprocessor, offering significant improvements in handling graphics and sound, with up to 16 colours on screen at the same time. It featured improved controllers that resembled the Atari, with a stick in the center and a sole button on the left side of the casing.

A unique feature of the Odyssey 2, was the inclusion of a full-size keyboard, allowing the machine to be used for educational purposes, as well as for gaming. Even though the machine had some following, especially in southern America, it never managed to compete against the VCS.



One of the negative aspects of the Magnavox 2 console, were the included controllers. Even though, in some models, they used the (de facto) Atari standard controller, the sticks were not centering properly, causing some issues with games. At the same time, the integration of a keyboard, even though appealing as a more mature device with more uses than just video games, failed to attract the attention of developers for either of the two intended uses. It was still a very capable machine, but without proper software support it could never compete against the juggernaut that was Atari, at that time.



In Europe, Magnavox Odyssey 2 was released as the Philips Videopac G7000, and it met with moderate success. By the time the second generation of consoles was underway, the number of available games for each platform was a strong decision point on the purchase. As such, the Atari VCS series ruled supreme, far surpassing the other consoles, thanks to its internal game development teams.

A rare version of the Videopac was the 7200, which included a built-in black and white monitor. This was the first video game system to feature its own screen, and it was quite innovative for its time, since most households during the late 1970s had a single, black and white, TV set.

The formula of delivering a complete system that includes a screen, will be perfected some years later by Amstrad for its CPC line of low cost personal computers.

Even though it could never compete on video game against the VCS, it had a moderate success as a more serious system. An interesting add-on device was the Philips C7010, offering the console the processing power to actually play chess!



Characteristic	Specification
Year of Release	1978
CPU	Intel 8048 (1.79 MHz)
Number of Colors on Screen	16
Number of Sound Channels	1 channel
Available Memory	64 bytes

Intellivision

The **Mattel Intellivision** was a groundbreaking video game console released in 1980 by Mattel Electronics. Positioned as a competitor to the popular Atari 2600, the Intellivision was one of the first consoles to offer superior graphics and sound compared to its competition. The system was built around the **GI CP-1610 microprocessor**, a 16-bit CPU running at 894 kHz, which provided more processing power and allowed for better visuals and smoother gameplay. This made the Intellivision stand out in a market dominated by 8-bit consoles.

Contrary to the other consoles, Mattel introduced a numeric keypad with 12 buttons and a directional disc-shaped controller that allowed for more intuitive movement in a game. Cartridges also came with overlays for the controller, offering more choices and control schemes, depending on the complexity of a game. The sound of the Intellivision was vastly superior to other consoles, since it introduced -for the first time- multi-channel stereo sound.



Mattel, an established toy-making company, had the significant capital to support the machine, something it did with great marketing plan and the development of a robust, and large, software library for the machine.

However, Atari was so well established, that Mattel, even though it had a superior product, lost the battle for the hearts and minds of consumers.

Characteristic	Specification
Year of Release	1980
CPU	GI CP-16010 (16-bit)
Number of Colors on Screen	16
Number of Sound Channels	3, stereo sound
Available Memory	1 KB RAM

VECTREX

The Vectrex was an incredibly -even today- unique video game system, in that it used a vector-based graphics system that allowed for smooth scrolling and ultra-fast movement. The system itself came with a built-in 9 inch monochrome screen, and included a controller with a stick at the left side and button on the right.

Even though the system did support the Illusion of colors, these were produced with the help of screen overlays that were included with the game cartridges.

Unfortunately, even though Vectrex incorporated some ground-breaking advantages over other systems, it could not find a proper market to be sold to, and never managed to compete against the Atari VCS (renamed 2600) or the Intellivision, which were the market leaders at the time of its release, with a very large and established user base and games library. The Vectrex would also succumb to the video game crash that would occur just a year after its release.



Characteristic	Specification
Year of Release	1982
CPU	Motorola 6809 (1.5 MHz)
Number of Colors on Screen	BW
Number of Sound Channels	1 channel
Available Memory	1 KB RAM

COLECO VISION

Coleco Industries was a company specialising in leather clothing. However, it saw the potential of the video game console market early on, and decided to create a machine that had similar graphics and animation with the coin operated arcade machines.

Even though it was based on an 8-bit Z80 microprocessor, it was a very fast version, and even sported 16KB of video memory, an unprecedented amount for such a machine at that time. Its graphics capabilities, along with partnerships with other companies that provided quality games -including Nintendo- meant that the machine had a very strong foundation to begin with.



Another significant advantage of the console was its innovative controller, which combined the best aspects of the Atari VCS and IntelliVision controllers. The controller featured a numerical keypad on the lower part of its body, while on top it had a stick with buttons placed on the left and right of the device. This innovative controller allowed for the development of games with more complex control schemes.



An additional benefit of the ColecoVision was the expandability of the machine, making it capable of adding new capabilities. One of the most famous expansion modules, allowed the ColecoVision to read cartridges for the Atari 2600, providing the console with compatibility with the huge library of the VCS console (image top left)!

Another expansion module, allowed a specialised wheel and pedals to be connected to the main console, providing added realism to the player, with graphics and functionality that -up to that time- where previously only possible in expensive arcade machines (image top right).



A final module, turned the ColecoVision into the Coleco Adam, a fully fledged and very capable personal computer. Coleco released the Adam as an expansion module as well as a standalone product. However, both the Adam and the console fell victim to the video console crash of 1983.

Characteristic	Specification
Year of Release	1982
CPU	Z80 (3.85 MHz)
Number of Colors on Screen	15
Number of Sound Channels	3, mono sound
Available Memory	1 KB RAM / 16KB VRAM

In this chapter...

In **Chapter 4** we learned about the second generation of video game consoles. Whereas the previous generation relied on games embedded in the console, in the second generation we find dedicated microprocessors and games running off external storage devices. The combination of the two allowed for much greater scope in games content, unleashing the creativity of game developers.

The second generation of consoles saw some remarkable achievements in both hardware and software that would redefine the market in the second decade. Along with the launch of the personal computer market, video game consoles and their games would reshape the industry - until the fateful crash.



- Chapter 5 •

Computers for All

"I think there is a global market for maybe five computers"

(Thomas Watson, president of IBM, 1943)

Introduction

The release of the first microprocessor by Intel, the 4004, and the subsequent development of other, inexpensive offerings from other companies, especially MOS technologies, led to a booming hobbyist market. Eventually, the untapped -and for many experts, illogical- market for a home computer was created, by some of the most unrelated people: a hippy, a geek, and a former taxi driver and typewriter repairman turned ruthless businessman.

Very soon, almost every respectable technology company would start releasing either their own computers, or hardware and software for others, in a new market that redefined our entire lives. In this chapter, we cover the first personal computers and related revolutionary products, up until 1983.



Olivetti P101

Olivetti is a pioneer technology company, established in 1908 in Ivrea, Italy, by Camillo Olivetti. Until the 1950s, Olivetti was mainly creating quality typewriters, but it entered the computer business in the 1950s with a series of mainframe computer systems.

In 1965, Olivetti created and released the first personal computer, the Programma 101. The release of the computer coincided with the



subsequent forced sale of the computer division of the company to General Electric. The revolutionary computer was created by Pier Giorgio Perotto, and was nicknamed Perottina or P101. To save the machine from the sale to GE, it was never called a computer, but instead it was promoted as a programmable calculator.

However, Perottina was far more than just a programmable calculator, since it borrowed features from mainframes of its time, costing several thousand more.

The computer was introduced at the 1964 New York World’s Fair, and it attracted the attention of the Media, resulting in strong initial sales. However, the loss of the computer division of Olivetti meant that the company would not become serious about computers for the next 15 years...

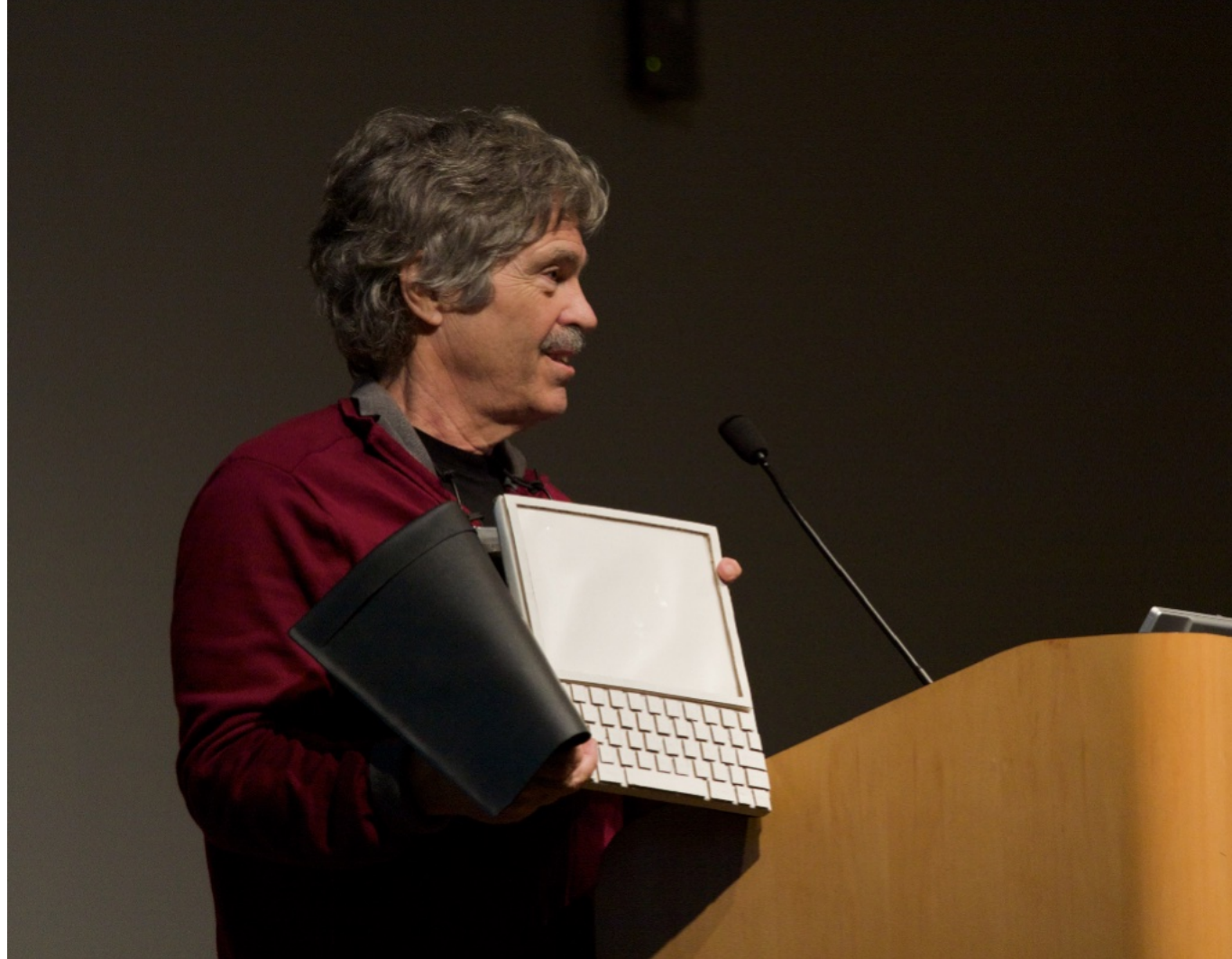
Characteristic	Specification
Year of Release	1965
CPU	Custom logic circuits
Number of Colors on Screen	NA
Number of Sound Channels	NA
Available Memory	240 bytes

Dynabook

In 1964, the first Liquid-crystal display (LCD) was invented at RCA Laboratories in Princeton. This was a monumental invention, since it allowed engineers to envision screens for portable devices such as digital watches and ultra-small calculators.

Alan Kay, fuelled by the prospects of integrating an LCD screen in an ultra-portable learning device, created the concept of the Dynabook - a portable, thin, lightweight computer that could revolutionise education. His vision was far ahead of its time, since he also suggested a graphic user interface and advanced multimedia features, characteristics that were at least almost two decades ahead of their time.

His work and vision would (partly) materialise in the 1970s at the Xerox Palo Alto Research Center (PARC), while working for the first computer with a graphical user interface, as well as in the development of the Smalltalk



programming language. Part of his vision was behind the development -years later- of the One Laptop Per Child student laptop.

Characteristic	Specification
Year of Conception (never released)	1968
CPU	Not specified
Number of Colors on Screen	Not specified
Number of Sound Channels	Not specified
Available Memory	Not specified

Xerox Alto

The **Xerox Alto** is widely regarded as one of the most influential and groundbreaking computers ever created. It was developed in the early 1970s at the **Palo Alto Research Center (PARC)**, a facility established by **Xerox** to explore technologies that could potentially enhance or replace their copier business. The Alto was part of Xerox's broader vision to stay ahead of the competition by investing in innovative computing technologies, with near-unlimited funding and no immediate concern for the cost of a final product.

The core development team behind the Alto was led by **Bob Metcalfe**, who was instrumental in the design of **Ethernet**, **Douglas Engelbart**, who had earlier inspired many of the Alto's innovations through his pioneering work on interactive computing, and **Alvy Ray Smith**, who contributed to the graphical interface design. These engineers, along with others at PARC, had the freedom to explore and push boundaries. As a result, they developed



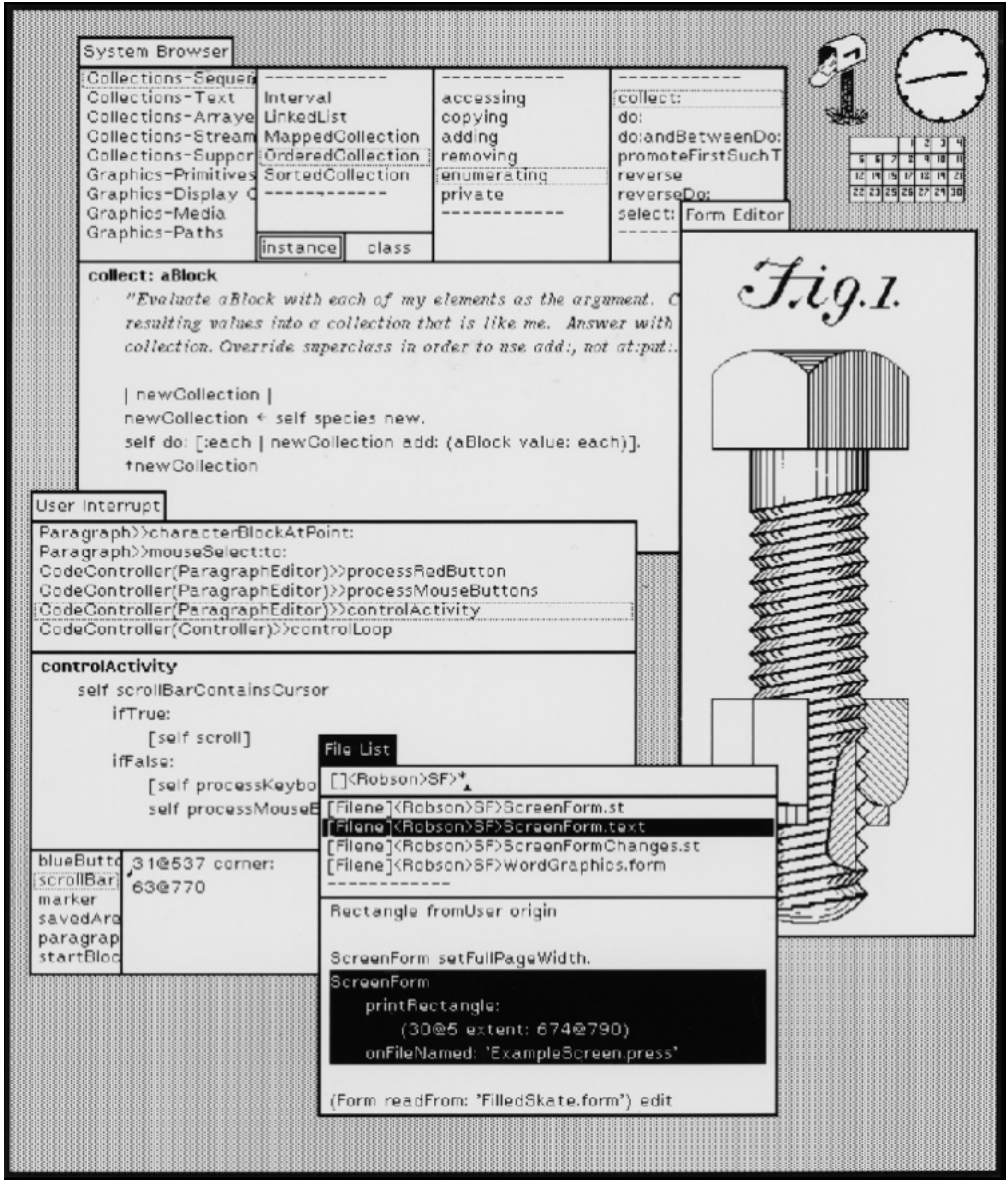
several technologies that would have a profound impact on personal computing for decades.

One of the Alto's standout features was its **graphical user interface (GUI)**, which was developed as a part of its operating system. Inspired by **Douglas Engelbart's** work on hypertext and the **oN-Line System (NLS)**, the Alto's GUI was designed to allow users to control all aspects of the machine using a **mouse** and **icons** on a high-quality **bit-mapped display**. This innovative approach to user interaction set the stage for the modern graphical desktop.

To support the demands of the GUI and the machine's other advanced features, a **custom CPU** was designed for the Alto. It was similar to the **PDP-11** in terms of processing power, giving it the computational capability to handle the demands of its graphical interface and other advanced functions.

Not content with just creating an advanced standalone computer, the Alto team also developed the **Ethernet networking protocol**, which enabled **file sharing** and **networking** between multiple Alto machines. This allowed the Alto to become a powerful tool for collaboration and file exchange within an office or research environment, laying the groundwork for modern networking technology.

Despite its groundbreaking features, Xerox's management showed little interest in commercializing the Alto. Efforts to market the Alto were met with indifference, and by the time Xerox finally recognized its potential, the **Apple Macintosh** had already emerged, incorporating many of the Alto's innovations, including the GUI and the use of the mouse. In hindsight, the Alto is seen as a visionary machine that was ahead of its time, and its contributions to the development of personal computing would echo throughout the industry in the years to come.



Xerox. Screenshot of Smalltalk GUI, copyrighted 1980. Courtesy of PARC.

Characteristic	Specification
Year of Release	1973
CPU	Custom
Number of Colors on Screen	Monochrome
Number of Sound Channels	NA
Available Memory	128KB RAM
Display Resolution	606x808

MITS ALTair 8800

Ed Roberts was seriously in the red... he had bet the farm (literally) on his new endeavor, a unique machine (almost) unlike any other (at least, at that price point). And he was very picky over its internals, rejecting more inexpensive (and less powerful) components like the Intel 8008 CPU and instead going for the powerful 8080. Someone suggested they name their product with a catchy name—one mentioned an episode of *Star Trek* and a faraway star, another highlighted its stellar performance—so they decided to name it **"Altair"** after the star!

By the early 1970s, the world—particularly the scientific and hobbyist communities—was catching up with computer technology. Interest in digital entertainment was growing, fueled by the success of **Spacewar!** and the newly released phenomenon known as **Pong**. Against this backdrop, the Altair 8800 had to make an impact, and it

was destined to kick-start almost everything, including the rise of **Micro-Soft** (as it was originally styled).

On **January 1975**, the stars aligned for the Altair! The 8800 was featured on the cover of *Popular Electronics* magazine with the headline, **"World's First Minicomputer Kit to Rival Commercial Models"**. The response was overwhelming. Ed Roberts, who had expected a few hundred orders, found himself flooded with thousands of requests in the first month alone. He had not anticipated such demand, and MITS (Micro Instrumentation and Telemetry Systems) struggled to keep up. In one now-famous story, an eager customer drove across the country in his minivan, camped outside the company, and offered to assemble his own unit. He ended up being hired on the spot by MITS!



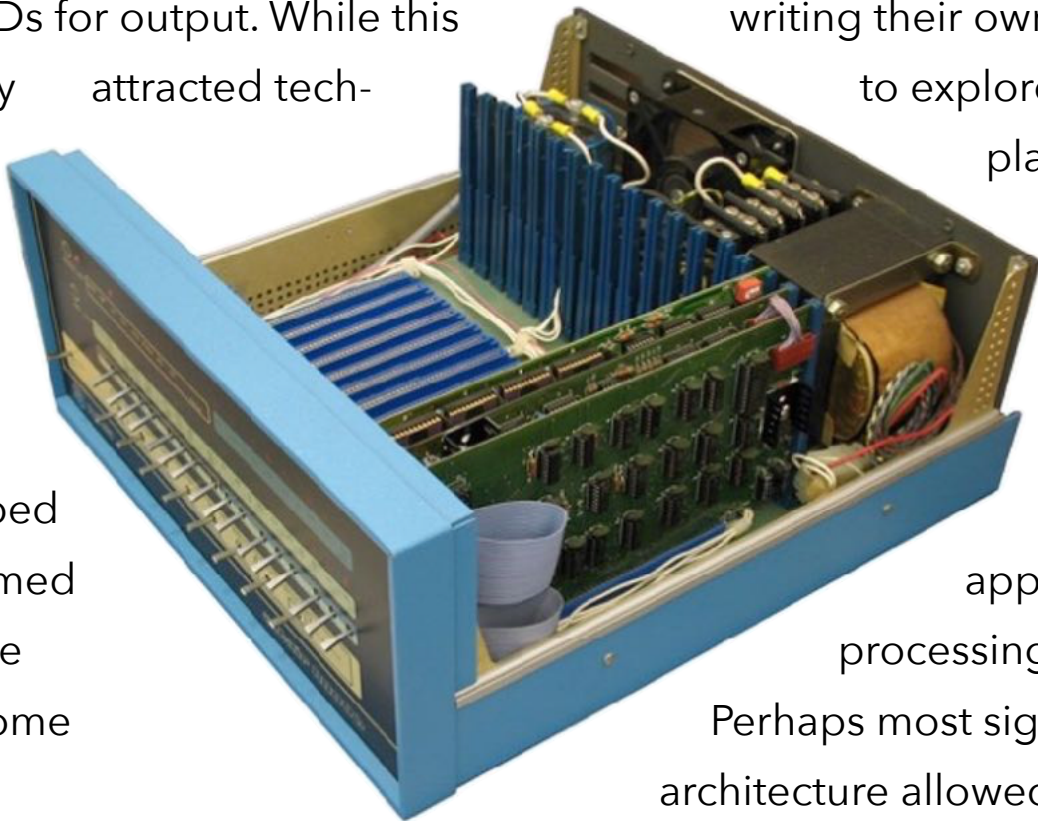
The Altair 8800 wasn't just a curiosity—it was a revolutionary platform. Initially, it was operated using toggle switches on the front panel for input and LEDs for output. While this interface was primitive, it quickly attracted tech-savvy hobbyists who saw its potential. Its real breakthrough came with the release of Altair BASIC, the very first software written for the machine. This software, developed by two young programmers named Bill Gates and Paul Allen, laid the foundation for what would become Microsoft.

The Altair 8800's influence extended beyond its sales. It provided a hands-on platform for future tech innovators, many of whom went on to found or shape leading tech companies. Its open design encouraged a thriving community of hardware and software enthusiasts, giving rise to user groups like the Homebrew Computer Club in Silicon Valley, where the seeds of companies like Apple were planted.

The Altair 8800 became a symbol of the burgeoning personal computer revolution, finding use across a variety

of tasks that showcased its versatility and potential. Hobbyists embraced the machine for programming, writing their own code in BASIC or assembly language to explore its capabilities. It also became a platform for simple text-based games and rudimentary graphics experiments, introducing early digital entertainment to a broader audience. While limited by modern standards, the Altair was used for basic business applications like bookkeeping and data processing, demonstrating its practical value.

Perhaps most significantly, its open S-100 bus architecture allowed users to expand its capabilities by adding memory, storage, and peripherals, fostering a wave of innovation in hardware design and customization.

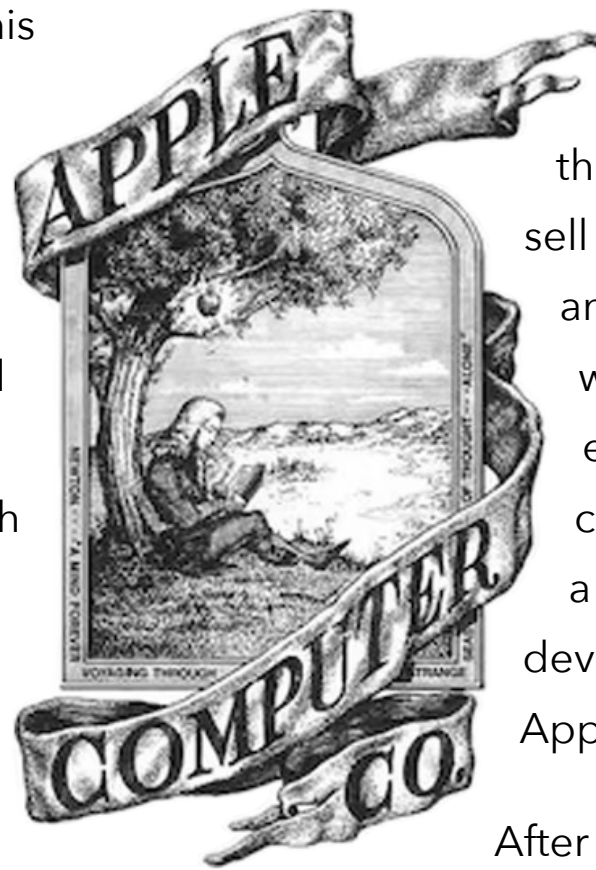


Characteristic	Specification
Year of Release	1975
CPU	Intel 8080 (2 MHz)
Number of Colors on Screen	NA
Number of Sound Channels	NA
Available Memory	256 bytes

Apple Computer

Steve Jobs was a most intriguing case of a college dropout. Even though he decided to stop his studies, he attributed the main reason to the fact that his (foster) parents were spending their entire savings on him, and he could not realise any true benefits out of the education he was receiving. However, he decided to stick around college, where he participated in calligraphy lessons, something that would become critical in how the Macintosh would later handle fonts.

Always with an inquisitive mind and a passion for electronics, he met an equally energetic person, Steve Wozniak or Woz, his complete opposite. Initially they took advantage of the incredible engineering skills of Woz to create a device that could make long-distance calls for free, but they would soon abandon this, as it proved too risky.



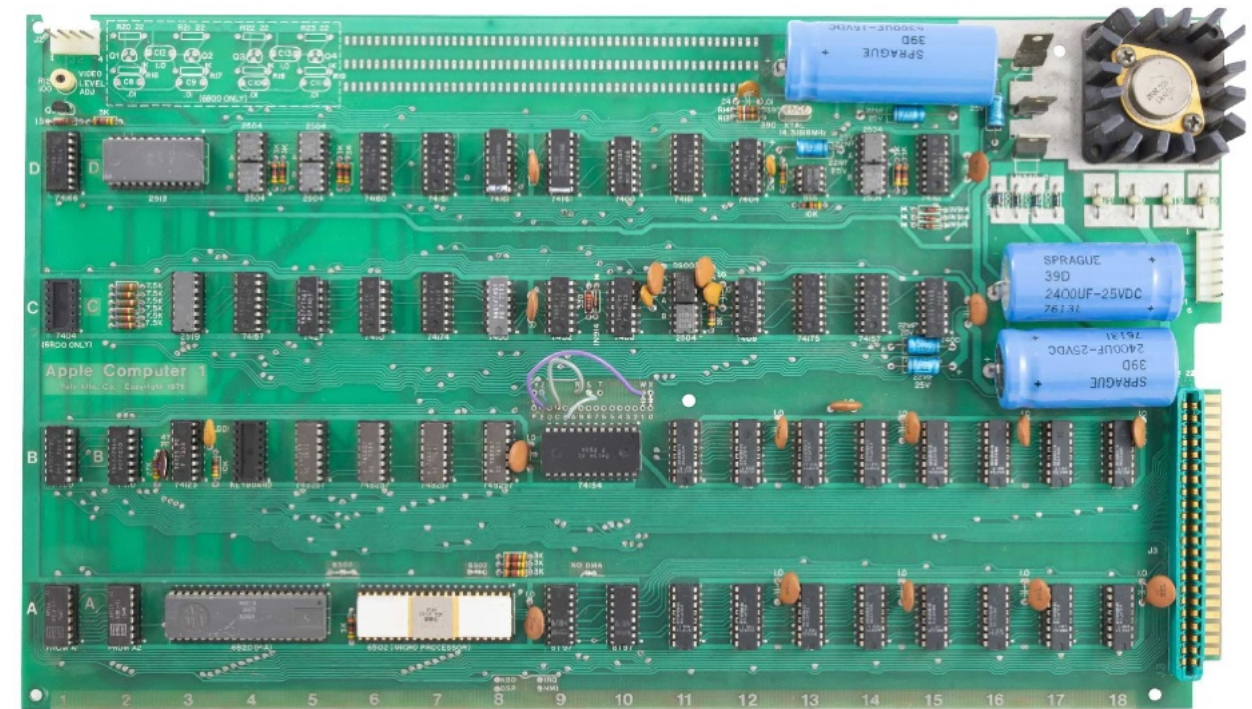
They were both participating in the Homebrew Club, a hobbyist group for computer enthusiasts, where people were demonstrating their kit (early) computers, including an Altair 8800. They both soon realised the potential of a personal computer, and tried to sell the idea to Atari -where Steve Jobs was working- and HP - where Steve Wozniak was working. Woz was a self-taught engineer that demonstrated exceptional abilities, and could design complex circuits with great ease (see "Breakout"). He was also a very capable programmer, which allowed him to develop -on his own- the first personal computer for Apple.

After both companies rejected their ideas, they decided to form their own company, with the help of Ronald Wayne. Their company, Apple Computer, Inc., was founded in 1976. Their first logo (image, page middle) was created by Ronald Wayne.

Apple I

The genius of Woz was evident in the design of the first computer that would be released by Apple. Named “Apple I”, the new machine would kickstart the fortunes of Apple. Woz had a vision, that every single person should be able to afford a computer, and thus he created an easy to use and inexpensive system.

Wozniak’s initial concept for the Apple I was based on the MOS Technology 6502 processor, a low-cost microprocessor that could deliver the computing power needed for home use. He designed the computer with 4 KB of RAM (expandable to 8 KB or 48 KB), a keyboard interface, and a video output that allowed users to connect the machine to a television or monitor. This design was revolutionary in that it was a single-board computer, meaning all of the components were on one piece of hardware, unlike the modular designs used in other systems at the time. The system required only a monitor, a keyboard, and an optional cassette player for storage to



operate—making it significantly cheaper and more accessible than its contemporaries. Jobs persuaded a local electronics shop, The Byte Shop, to purchase 50 units of Apple I for a price of \$500 each. Even though they promised to deliver the units fully assembled, they did not keep their promise and instead delivered them as a DIY kit.

Characteristic	Specification
Year of Release	1976
CPU	MOS 6502 (1 MHz)
Number of Colors on Screen	Monochrome
Number of Sound Channels	Basic beep
Available Memory	4K RAM

Road to Apple II

Even before the completion of the Apple I, Woz was working on the prototype that would form the Apple II. He intended to have an expandable machine via card slots, to support colours, sound, and to be able to connect peripherals. And, another big change from the Apple I, was the fact that the new computer would be sold complete, including a power supply, keyboard and case.

In order to do that, apart from the designs of Woz, the two Steves had to acquire funding. Steve Jobs was incredibly persistent and he pursued every possible way to secure funding for the new company. However, he had to face two insurmountable problems: (a) the concept of a personal computer was unheard of, and no such market existed, and (b) his hippy appearance -not to mention hygiene at the time- was a huge negative when it came to talking with banks or investors. Fortunately, Steve Jobs, after pestering every single person that could fund his garage-based company, managed to attract the attention of Mike

Markkula, a retired -at age 32!- millionaire, who made his fortune working for the semiconductor industry. After visiting the famous garage where Woz, Jobs, his sister, and some friends, were assembling Apple I boards, he was blown away by the potential of the Apple II and decided to invest \$250 000, for a 30% stake in the company. That was after Wayne, one of the original founders, had left the company since he could not tolerate the possibility of bankruptcy from the other two Steves. Markkula developed the first business plan for the company and guided the two Steves in creating a truly iconic machine.

Employee #0

Mike Markkula realised that Steve Wozniak was the real brain and genius behind the creation of the Apple I and the Apple II. He did understand the role that Steve Jobs had to play in the company, but at the time he still had to prove himself. Markkula suggested that Woz was named “employee #1”, of Apple Computer. Steve Jobs, not wishing to come second, decided that he would be “employee #0”!



The Apple II, released in 1977, was the first, mass produced personal computer ever released, in complete form (motherboard, power supply, keyboard), encased in a plastic case that allowed users to expand the system themselves.

The machine was based on the MOS Technology 6502, running at 1 MHz, with 4KB of RAM, expandable to 48K. It supported color graphics and sound, making it even more suitable for home and personal use than the competition (which was virtually non-existent at first).

Steve Wozniak, a self-taught charismatic engineer, wanted the machine to be expandable so that other users might create additional components that would give his creation even more versatility, a wise decision that kept the Apple II line of computers going for years to come! For that reason, the RAM could be upgraded by the users, who also had access to no less than eight expansion cards. For storage,



the Apple II came with a cassette interface, but Apple soon released floppy drives (picture above).

Characteristic	Specification
Year of Release	1977
CPU	MOS 6502 (1 MHz)
Number of Colors on Screen	16
Number of Sound Channels	1 channel
Available Memory	4K RAM
Display Resolution	40x24, 280x192



Jack Tramiel (Idek Trzmiel) was a Holocaust survivor. His entire family was killed in concentration camps. He had a vision to create his own company and in 1954, he started a typewriter repair business and soon he started selling office equipment. Initially, he wanted to name his company General or Admiral, but those names were already taken, so he chose the name "Commodore". His company was officially founded in 1976, by him and Irving Gould, a person who would hound every decision, for the next decades.

By 1960, Tramiel realised the potential of electronic calculators and he entered the market, only to be brought to the brink of bankruptcy, since his competitors, and mainly Texas Instruments, created their own components and therefore could sell at a much lower price. This, along with the Japanese entering the market with competitive products and low prices, drove him to the conclusion that he should control the main components he would use for

his machines, to ensure he would never be undercut in prices.

Once he recognised that MOS Technologies, the creators of the 6502 microprocessor, were in dire need of financial support, he strong-armed them to sell the company for almost nothing. Chuck Peddle, the founder of MOS, was not at all happy but he saw no alternative but to concede. Tramiel recognised, not only the potential of having acquired MOS and the microprocessor they had created, but also the incredible talent of Chuck Peddle. Peddle would convince Jack to create their own computer.

Jack, the negotiator...

Jack Tramiel was known for his explosive temper, and for his ruthlessness in business dealings. It is said that, when negotiations often reached a dead end, he would raise his sleeve and let the other side see the number the Nazis had engraved on his arm during the holocaust. That, would convince them that Jack could survive anything.

commodore **PET** Personal Computer

Chuck Peddle managed to convince Jack Tramiel to develop their own personal computer. Tramiel was ruthless, but also could see far ahead, and recognise the potential of emerging markets. He gave Chuck Peddle permission to pursue his goal of creating a personal computer, but it had to be cost-effective, and use as many of their own components as possible.

The first version of the Commodore PET (Personal Electronic Transactor) was an all-in-one machine that included a monitor, a tape recorder, and a keyboard- albeit a simplistic one, based on the calculator keyboards they already had in mass production.

The PET was so affordable that it established its own strong presence in the market, and through clever and strategic decisions, it found its way in schools, homes and the workplace. It was released shortly after the Apple II, and it became successful, due to its competitive price and



features that offered the user everything they needed right out of the box, including a version of Microsoft BASIC.

Characteristic	Specification
Year of Release	1977
CPU	MOS 6502 (1 MHz)
Number of Colors on Screen	Monochrome
Number of Sound Channels	None
Available Memory	4K RAM
Display Resolution	40x25 (text characters)

MARRIAGE

Jack Tramiel had an amazing intuition that, most often than not, proved him right. He correctly listened to Chuck Peddle and they released their own, complete computer system, at a competitive price point and just months after the Apple II went on sale. The hardware was there, everything a user needed right out of the gate was there, but the software -and some tools- were badly needed.

Both Tramiel and Peddle knew that they needed a BASIC programming language to go with their computer. So, Jack approached Micro-Soft, to license their amazing creation for their own home-grown “pet”. At first, Bill Gates insisted that Jack paid “just \$3 per computer sold”. Jack, in mere nanoseconds, replied “I am already married” and just offered Bill \$25000 and be done with it! Bill relented, as he knew that Jack, once he had made up his mind, was impossible to dissuade. That was the first, and last, collaboration between Jack Tramiel and Bill Gates.

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Charles Tandy, the man behind the Tandy Corporation's rise, was a visionary entrepreneur with an eye for emerging trends. Born into a family that ran a leather goods business, Charles saw potential beyond the niche market of leathercraft. After taking the reins of the family company in the 1940s, he expanded its operations, eventually transforming it into a diversified retail empire. His most significant move came in 1963, when he purchased the struggling RadioShack, a small chain of nine stores in Boston that specialized in amateur radio and electronics.

Initially, RadioShack was on the verge of bankruptcy, weighed down by debt and an unfocused business model. However, Charles Tandy recognized the growing consumer interest in electronics and saw an opportunity to reposition RadioShack as the go-to retailer for hobbyists, tech enthusiasts, and later, everyday consumers. He streamlined operations, expanded the product range, and aggressively grew the number of stores across the United States,

leveraging Tandy Corporation's capital and expertise in retail.

By the late 1960s, Tandy Corporation had established RadioShack as a leader in consumer electronics, offering everything from electronic components to citizen-band (CB) radios. Charles Tandy's philosophy was simple: make electronics accessible and affordable. He famously said, "We're not going to sell to the Queen of England; we're going to sell to the guy who works in the gas station." This was similar to Jack Tramiel's mantra "computers for the masses, not for the classes".

Tandy's most groundbreaking move came in the 1970s, when he recognized the potential of the emerging personal computer market. In 1977, under his leadership, RadioShack launched the TRS-80 Model I, one of the first affordable personal computers. Its success was monumental, with RadioShack's expansive retail network playing a crucial role in its widespread adoption.

TRS-80

The development of the **TRS-80 Model I** began with a bold idea by Don French, an engineer at Tandy Corporation, who saw the growing potential of personal computers. French was inspired by the early hobbyist machines like the Altair 8800 and the growing interest in microcomputers among tech enthusiasts. He pitched the concept to Charles Tandy and other executives, arguing that the company's vast RadioShack retail network could bring computing to the masses. Initially skeptical, Charles Tandy eventually gave the green light, but on a tight budget and with a strict timeline. To turn the idea into reality, French recruited Steve Leininger, a talented engineer from National Semiconductor. Leininger was tasked with designing an affordable yet functional machine. The budget constraints dictated many of the design choices. For the CPU, Leininger selected the Zilog Z80, a cost-effective yet powerful chip for its time. The machine was designed with 4 KB of RAM, expandable to 16 KB, and included a basic monochrome display. A



cassette tape interface was chosen for data storage to keep costs low, avoiding the expensive floppy drives used by competitors. The machine was released in 1977 for \$599.

Characteristic	Specification
Year of Release	1977
CPU	Zilog Z80 (1.77 MHz)
Number of Colors on Screen	Monochrome
Number of Sound Channels	None
Available Memory	4K RAM
Display Resolution	64x16

The "Holy Trinity" (1977)



The **Apple II** (middle), **Commodore PET** (left), and **TRS-80 Model I** (right) are often referred to as the "**Holy Trinity**" of **personal computing**, as these three machines defined the early era of mass-market

personal computers. Released in **1977**, each of these computers brought unique innovations and played a critical role in popularizing personal computing for homes, schools, and small businesses.

sinclair

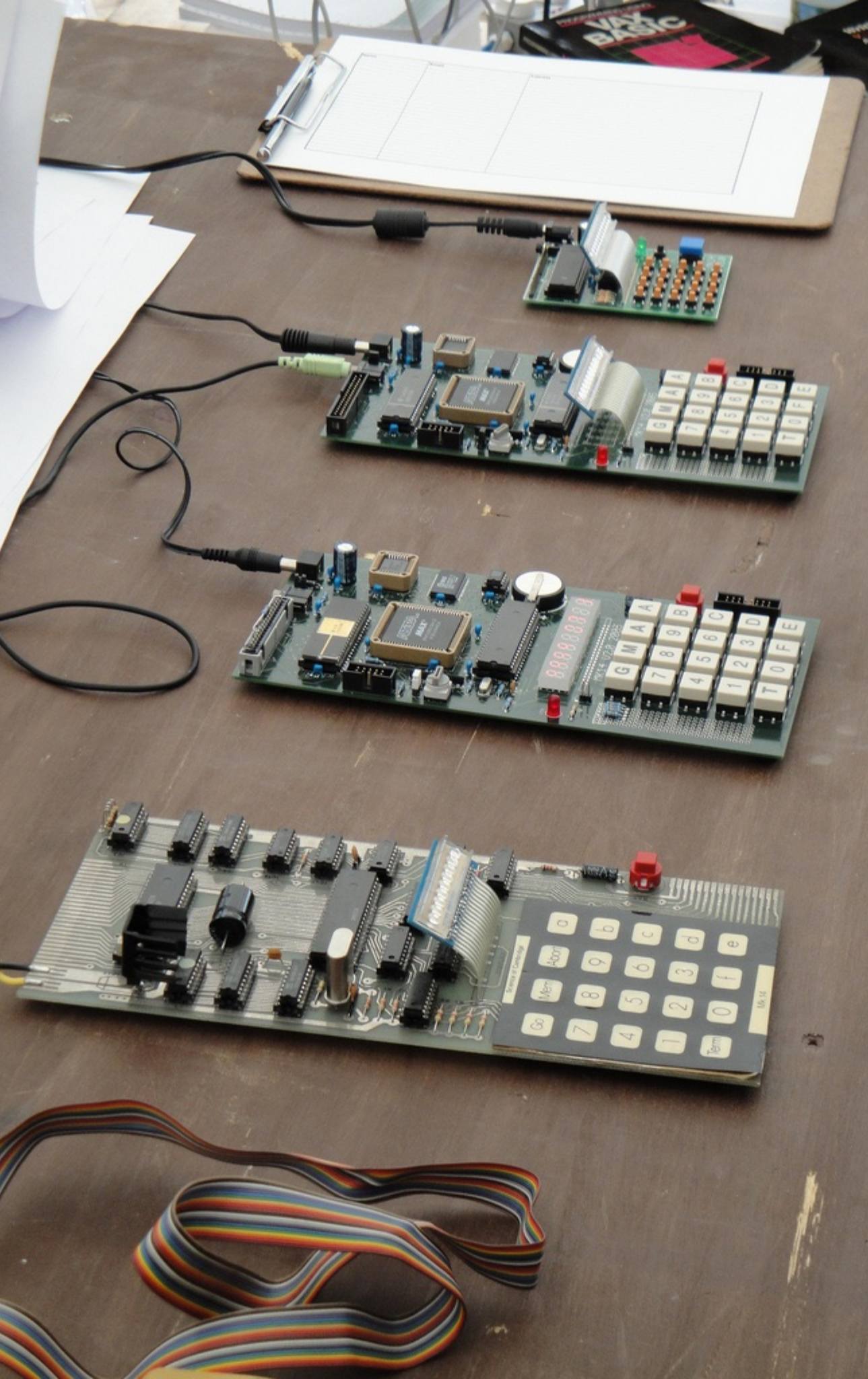
The story of (Sir) Clive Sinclair and his companies began in the early 1960s, when he founded Sinclair Radionics Ltd, in Cambridge, England, to develop hi-fi, calculators and other electronic devices. One of the innovations of the company was a digital watch they developed. However, problems with the watch became evident early on, including reliability issues, complex repairs and short battery life, leading the company to a near bankruptcy, for which the government had to intervene. To avoid losing control of his company, Clive Sinclair founded a new one, called Sinclair Research, in 1973. He also managed to convince Chris Curry, a former associate at Radionics, to change positions and move to the new company.

Sinclair Research managed to create a series of low-cost digital products, including an executive calculator (even though work began at Sinclair Radionics), a wrist calculator, which was innovative but not successful, and a microcomputer kit, the MK14, released in 1978. The MK14

was a product envisioned by Chris Curry, who tried to convince Sinclair to steer the company towards personal (or “home”) computers and away from other type of devices. Even though the MK14 met with some relative success, it was not enough to make Sinclair change his mind and focus on the new, and emerging, computer business for personal use.

Disillusioned, Chris Curry left Sinclair Research, and along with other fellow engineers, founded Acorn computers to pursue their passion for creating new, affordable, complete machines for the average user.

Ironically, only after Chris Curry left to form his own company Sinclair relented and decided to pursue the goal of creating inexpensive computers for home use. He would soon release the first complete systems (while also offering a kit), and become an icon in the British home computer market.



Sinclair MK14

The MK14 was released as a kit for hobbyists with experience in assembling their own hardware. It was based on an inexpensive microprocessor from National Semiconductor, and used a simple keypad for entering data, while an array of LEDs provided visual output for the machine. It was met with moderate success, and convinced Chris Curry -but unfortunately not Clive Sinclair- that the computer market was not only viable, but was already happening, both in the US and in the UK.

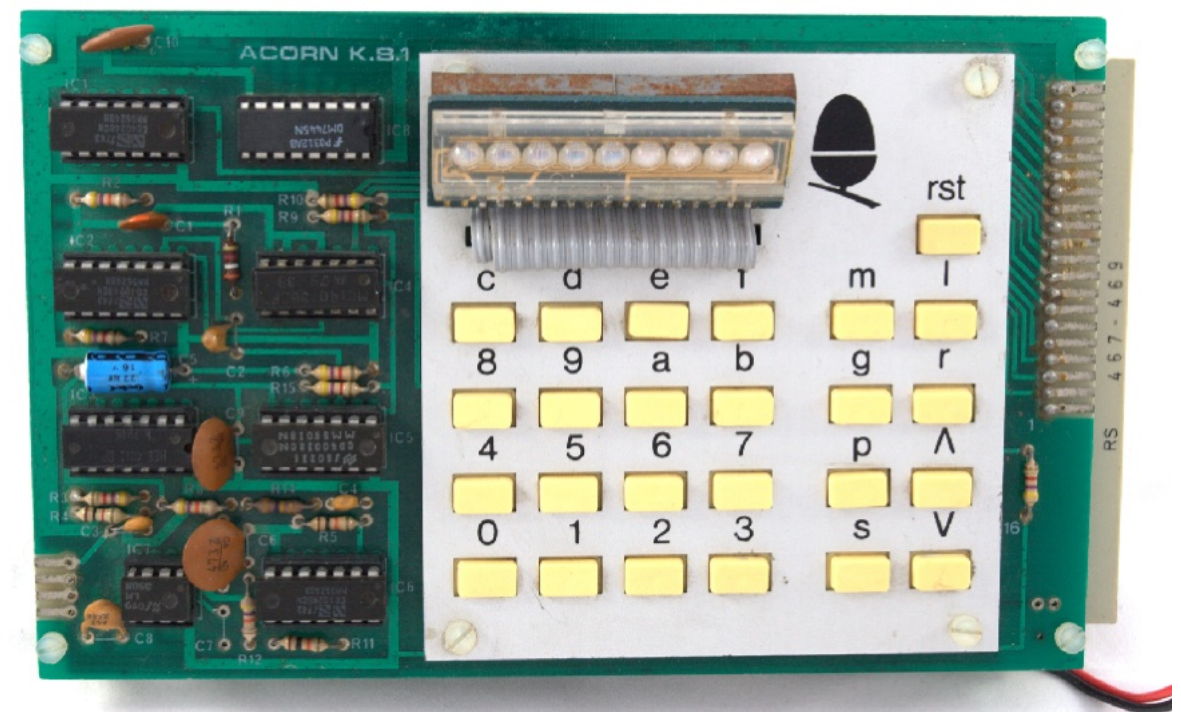
Characteristic	Specification
Year of Release	1978
CPU	INS8060 (4 MHz)
Number of Colors on Screen	Monochrome
Number of Sound Channels	None
Available Memory	256 bytes RAM
Display Resolution	6-digit, 7-segment LED



As the personal computer revolution started taking place in the US, a group of three engineers in UK, Hermann Hauser, Chris Curr and Steve Furber, decided to pursue their own dream of creating a new and affordable computer, that would appeal to ordinary users.

Having realised the potential that the microprocessor created, they knew that a general purpose, low-cost computer was not only feasible, but it was already happening elsewhere. In 1978, they founded a new company, and they named it Acorn, as a symbol of growth and potential.

Their first creation, **Acorn System 1**, was a low cost 8-bit computer in the form of a kit, aimed (mainly) at hobbyists and students. It was based on the MOS 6502 microprocessor, and was released in 1979. The main engineer who created their first computer, was Sophie Wilson, who would later be recognised as one of the most important innovators of her time. The machine was nothing

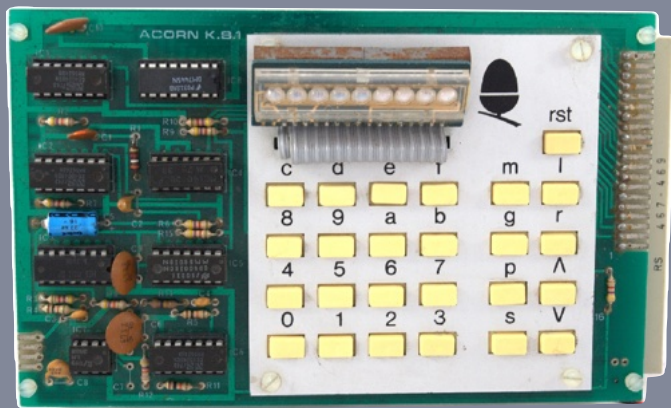


more than a circuit board with a series of LEDs and a small keypad, on top of a board with integrated circuits. The user could connect the board to a cassette recorder for storage. System 1 was met with a considerable success, and helped establish Acorn as a company.

Characteristic	Specification
Year of Release	1979
CPU	MOS 6502 (1 MHz)
Number of Colors on Screen	Monochrome
Number of Sound Channels	None
Available Memory	1 KB RAM (expandable to 4KB)
Display Resolution	None

Acorn System 1 & BBC Micro:bit

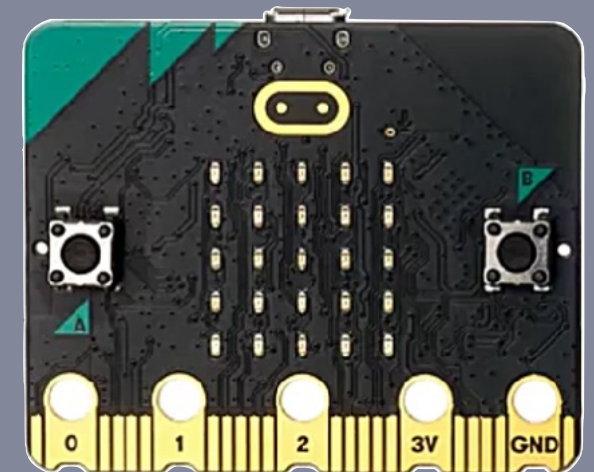
The **Acorn System 1** (left) and the **BBC Micro:bit** (right) are two important computers in the history of educational technology, designed to make computing more accessible.



Though released decades apart, they share common engineers, educational goals, and a focus on hands-on learning. The **Acorn System 1**,

launched in **1979**, was created by **Hermann Hauser**, **Chris Curry**, and **Steve Furber**. Their aim was to create an affordable computer for hobbyists and schools. The system was sold as a kit that users could assemble, helping them learn about how computers work. The focus was on microprocessors and basic computing skills. The **BBC Micro:bit**, released in **2016**, was developed through a partnership between the BBC, **ARM**, **Microsoft**, and **Samsung**, with **Steve Furber** involved once again. The goal was to teach young students how to code. It was given

for free to Year 7 students in the UK to help them learn programming through simple activities. While the Acorn System 1 focused on hardware and technical learning, the Micro:bit focused on coding and digital literacy for children. Both computers aimed to make technology more accessible for education. The Acorn System 1 was designed for schools and hobbyists to explore computing, while the Micro:bit aimed to teach young students how to create with technology. Another similarity is that the **ARM processor**, developed by Acorn in the 1980s, is the technology behind the BBC Micro:bit. This shows how Acorn's early work continues to influence educational computing today. The engineers behind them, including **Steve Furber**, played a key role in shaping educational technology for future generations.



Atari 400 & 800

Atari, a pioneer in video game consoles, and under the leadership of Warner Communications, decided to enter the home computer market, by releasing a computer that was capable of supporting incredible -for its time- graphics, while offering value for educational and personal use. Atari decided to release two models, based on the same hardware, but with changes that would place them in different categories: a lower cost model, primarily for younger users who would use them mostly for playing games, and a second model, with more memory and expansion capabilities, along with a normal keyboard, as a more professional machine.

The project was led by Jay Miner, a visionary with a passion for graphics and sound. Along with Joe Decuir, who worked on the custom chips of the machine, and Steve Mayer, who helped design the Atari 400 and 800, they



created a computer with unparalleled capabilities.

What made the computers stand out was the use of three custom co-processor chips. The ANTIC

(Alphanumeric Television Interface

Controller) helped the computer generate sophisticated graphics. The GTIA (Graphics Television Interface Adaptor) handled color, movement of sprites and collision detection, while the POKEY controlled audio, input/output, and keyboard functions.

These custom chips enabled the machines to support 256 colours and offered multiple graphics modes, including a high-resolution 320x192 pixels. The POKEY chip supported four sound channels, giving the machine a dramatic edge over anything else in the market at the time.

The Atari 400 came in a striking case that featured a flat, calculator-style keyboard, that hindered typing, while the Atari 800 had a bigger case, with a similar keyboard layout but featuring a normal typewriter keyboard. It also had two cartridge slots, even though -like the Atari 400- it was incompatible with the Atari VCS games. The 800 had 4 internal expansion slots, that expanded its capabilities.

Both machines featured the standard Atari joystick ports, and were compatible with the controllers from their video game console siblings, offering tremendous possibilities -along with their advanced graphics and sound- for being remarkably capable game machines.

The 400 & 800 shipped with the BASIC programming language, allowing users to take their first steps in coding, or to type listings from computer magazines.

What's in a [code]name

Atari was a non-conventional company when it came to employee relationships. It was usual for the company to name its machines after its female workers. The Atari 400 was known internally as “Candy”, while the 800 as “Colleen”. Both Candy and Colleen were secretaries working at the company, during the development of the machines.



Characteristic	Specification
Year of Release	1979
CPU	MOS 6502 (1.79 MHz)
Number of Colors on Screen	Up to 256
Number of Sound Channels	4
Available Memory	8 KB RAM, expandable to 48 KB
Display Resolution	Up to 320x192

PIXAR

The unprecedented success of "Star Wars" paved the way for the forming of a media empire led (fortunately) not by the Dark Side but by George Lucas himself. In trying to create his ground-breaking space movie, Lucas managed to retain all the rights to the Star Wars franchise. And he knew that was only the beginning of huge things to come!

In 1979, George Lucas create a computer division, to explore ways to create more realistic -and cost effective- movies. Soon, his computer division was split into departments, one for games and one for exploring a new medium, 3D graphics and animation. The games group was officially named "Lucasfilm Games Group" while the graphics group was renamed "Pixar".

However, things were not rosy in Ranch Skywalker! George Lucas, in 1986, was in serious need of cash, and he was selling assets he considered non-essential for his movie business. Luckily (at least, that's how it seemed at first!)

Steve Jobs was looking out for the NeXT big thing, and he decided to purchase Pixar, in 1986, becoming its CEO.

Steve Jobs quickly realised that Pixar had created their own computer. In fact, Pixar was founded for such a purpose!



Acorn Atom

The Atom was the culmination of years of research and experience in creating electronic devices and computers in kit form. After the success of the Acorn System 1, Steve Furber, Sophie Wilson, and other key engineers under the leadership of Hermann Hauser and Chris Curry, Acorn’s founders, created their first complete single-board computer. The Atom was sold either as a kit for assembly by hobbyists, or as a pre-assembled unit. It featured a proper keyboard, and could be connected to a domestic television set. For storage, the Atom could be connected to an optional external tape recorder.

The computer was based on the MOS 6502 CPU, running at 1 MHz. It had 2KB of RAM, expandable to 12KB, and 8 KB of ROM. It supported multiple resolutions, with a maximum of 256x192 pixels. Even though it was a quite



capable machine in terms of graphics (albeit monochrome), it supported very basic sound.

The Atom was not a huge commercial success. However, the experience gained from it, allowed the company to proceed with their next project, and develop the BBC Micro, one of the most iconic computers ever released.

Characteristic	Specification
Year of Release	1980
CPU	MOS 6502 (1 MHz)
Number of Colors on Screen	Monochrome
Number of Sound Channels	None
Available Memory	2KB RAM (expandable to 12KB)
Display Resolution	256x192

Sinclair ZX80

Clive Sinclair knew his business was in a mess: the Japanese had grabbed the market right out of his hands, with calculators selling at a fraction of the cost he could produce them himself. Chris Curry, his most trusted engineer, left the company to create his own, named Acorn... So, he had to make drastic changes or his company, Sinclair Research Ltd, would perish...Pacing up and down for days and days, he came up with the solution: create a "home" computer, using components he already had, and around an inexpensive CPU called Z80, but with a cost of (just) under £100. That was unheard of, since in 1979, even the most basic computer for home use cost hundreds or more than a thousand pounds. He squeezed his MENSA-qualified brain a lot, and he finally found the solution(s): they didn't need a storage device, let the users buy it later, they didn't need audio, or color. And, the most amazing feat of all... he assumed users would not care if it crashed once or twice per day - so he purchased faulty memory at a bargain. So,



his little white plastic toy, was sold at £79.95 as a kit, and £99.95 fully assembled! The ZX80 came to be, a complete computer, albeit one that was severely underpowered, and yet, it enabled Sinclair to open the road for the most iconic British computer ever, the Spectrum!

Characteristic	Specification
Year of Release	1980
CPU	Zilog Z80A (3.25 MHz)
Number of Colors on Screen	Monochrome
Number of Sound Channels	None
Available Memory	1 KB RAM (expandable to 16KB)
Display Resolution	32x24 characters

VIC-20

"The Japanese are coming. Be like the Japanese!". That was the order Jack Tramiel gave to his engineers, just after the release of the Commodore PET. Tramiel knew that it was only a matter of time, the Japanese would release computers in the US and the rest of the world that were equally, if more powerful, at a much lower cost than the competition. He also knew that, when it came to competing with companies outside Japan, the Japanese were working as one - that's why he called them "Japan.Inc".

His engineers were given the -not easy- task of developing a cutting edge computer, at a cut-throat price, using readily available components, to keep the cost down. The machine would have to appeal to the masses, and it was going to be targeted at the home market. With the new computer, Tramiel expected to undercut the competition from Apple, Atari and Tandy, who had already released, or were planning to release, home-oriented computers.



Robert Russel was the main hardware engineer, with Michael Tomczyk being the main product manager, and with Al Charpentier as the chip designer. Soon, Commodore had a machine that complied with everything that Jack Tramiel asked, in a small "breadbin" box that was hardly bigger than the keyboard it housed, selling (at launch) for \$299, a very competitive price point for its time.



The name of the computer (VIC-20) derived from its advanced Video Interface Chip (VIC), which was originally designed for arcade games. The availability of the VIC chip allowed Commodore to create a very capable machine with advanced graphics and sound capabilities, and still keep the costs down, undercutting the competition. It had a graphics resolution of 176x184 pixels for bitmap graphics, with up to 16 colours on screen at the same time. Its audio capabilities were equally significant, with support of three voice channels, something quite groundbreaking for the time. The main processor was the MOS 6502, running at 1 MHz, with 5KB of RAM, expandable to 32KB.

For storage, it supported an external cassette drive, while it could accept cartridges as well, mainly for gaming purposes.

The computer came with Commodore BASIC, which was based on the Microsoft BASIC the company licensed for a



flat fee (see "Marriage"). However, Commodore kept updating the language over the course of the lifespan of its machines, while enabling third parties to extend its functionality.

The VIC-20 was an enormous success for Commodore, and it was the first personal computer to sell more than 1 million units. It was also the most affordable personal computer in the US for years to come, offering great value for money. The VIC-20 also paved the way for the Commodore 64, one of the most successful personal computers ever created by any company.

Characteristic	Specification
Year of Release	1980
CPU	MOS 6502 (1 MHz)
Number of Colors on Screen	16 colors
Number of Sound Channels	3
Available Memory	5 KB RAM (expandable to 32 KB)
Display Resolution	176x184 pixels

Sinclair ZX81

The ZX80, even though severely underpowered -and in some extent, unusable- was a commercial success that allowed Clive Sinclair to proceed with a successor. This time, the new computer would build on the strengths of the previous one, but with much improved performance - and even more affordable!



Zilog Z80A microprocessor, running at 3.25 MHz. This time, a black color was chosen for the case of the computer, a trend that would continue from now on for all Sinclair computers. The low price, £49.95 (as a kit) or £69.95 (pre-assembled), helped ZX80 sell more than 1 million units!

The ZX81, as it was named, was slightly redesigned, keeping a similar membrane keyboard to reduce costs. It had a similar form-factor, and it was based -unsurprisingly- on the



Characteristic	Specification
Year of Release	1980
CPU	Zilog Z80A (3.25 MHz)
Number of Colors on Screen	Monochrome
Number of Sound Channels	None
Available Memory	1 KB RAM (expandable to 16KB)
Display Resolution	32x24 characters

Osborne 1

The first truly portable computer -even though it was not autonomous, due to a lack of internal battery- was the Osborne 1. It was designed by Adam Osborne, and was just the right size to be carried by its handle and placed under an airplane seat.

The computer had a 5-inch CRT screen, two 5.25-inch floppy drives, and it was running on a Zilog Z80 running at 4MHz, with 64 KB of RAM.



Osborne made sure that the machine was packed with necessary software,

including WordStar and SuperCalc, a word processing and a spreadsheet application. The combination of hardware and software sold for less than \$2000, making the computer a cost-effective option for professionals.

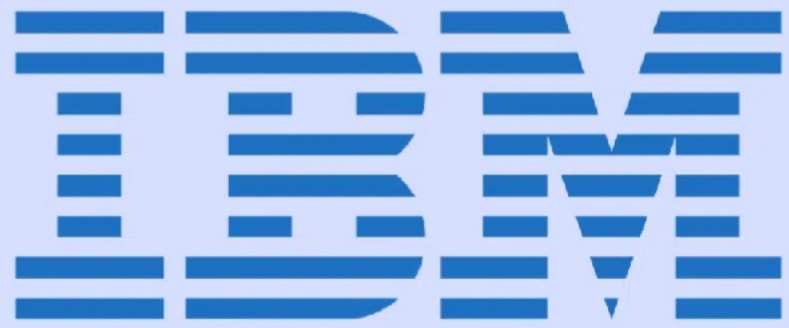
Even though it was initially a success, the bulky design, the premature announcement of a more advanced model -that stalled sales- and the reluctance of developers to write for the machine, led to the bankruptcy of Osborne in 1983.

Characteristic	Specification
Year of Release	1981
CPU	Zilog Z80A (4 MHz)
Number of Colors on Screen	Monochrome
Number of Sound Channels	None
Available Memory	64 KB
Display Resolution	52 characters x 24 lines

The Osborne Effect

Adam Osborn was a known writer and publisher of documentation on microprocessors and software. In fact, he was one of the leading writers in the late 1970s, causing a lot of controversy for his opinions. One day, he came up with an amazing idea: create a computer in a case, robust enough to be carried around, yet small enough so it could fit under the seat of a plane. This way, every businessman (or businesswoman) could carry their computer across the USA, in every business trip! He also had an amazing vision: build two floppy drives into the machine, and include for free the most common business software, that would otherwise cost as much as the computer itself! And thus he created the first commercial portable computer, his proud accomplishment! At least until he started boasting about the “next generation of machines that would come out soon and outperform my current one”. Well, why would you buy a machine now, if a faster, leaner, meaner one is just around the corner? And that’s how Osborne shot his own foot and drove his company into bankruptcy...





International Business Machines

IBM (International Business Machines Corporation) was founded in 1911 as the Computing-Tabulating-Recording Company (CTR), a merger of four companies that specialized in producing tabulating machines, scales, and other office equipment. In 1924, it was renamed to IBM, reflecting a broader focus on business machines and technology.

Throughout the early and mid-20th century, IBM was a leader in the development of mainframe computers, with products like the IBM 701 in 1952, which was the company's first scientific computer. By the 1960s, IBM was synonymous with mainframes, especially with the introduction of the IBM System/360 in 1964, a revolutionary product that standardized computing platforms and allowed businesses to scale their operations more effectively.

In the 1970s, IBM continued to dominate the high-end computing market with its mainframes but faced increasing



competition from emerging personal computer companies. The IBM 5100 (image above), a portable computer introduced in 1975, was one of IBM's first forays into the personal computing market, though it was expensive and aimed at professionals.

One of the main reasons the IBM 5100 was so expensive, was the use of specialised components that drove the price of the computer to almost unreachable heights. By using proprietary hardware and software, users could not justify the price for what it could do - and in 1975, there was little -if any- reason to carry such a huge device around.

IBM PC 5150

Having learned from the failure of the 5100, IBM decided to create a project that could use readily-available components to create an inexpensive personal computer. This was a highly unusual move for a company known for keeping all its technology under wraps, and for using proprietary components in its systems. However, the growing personal computer market could not be ignored, and the name of IBM itself could not help it establish a foothold, when their machines were priced more than 4 times the cost of the competition. Not only that, but IBM felt that personal computers would soon become powerful enough to replace some of the mainframes that made a large part of the profits of the company.



The person to create the new type of computer was Don Estridge. He was allowed to

take the initiative and research the market for the components he could use on their new computer. Don decided to use the Intel 8088, an 8-bit CPU, instead of the more powerful but more expensive 8086.

Initially, IBM considered licensing the CP/M operating system from Digital Research. However, they could not come to terms that IBM could agree with, leaving the company to seek help from elsewhere, opening the door to Bill Gates to license "his" MS-DOS.

The IBM PC 5150, as the machine was finally named, was released in 1981, with a 4.77 MHz Intel 8088 processor and 16 KB of RAM, expandable to 256 KB. It utilized floppy disks as its primary storage, with a base model featuring a 360 KB 5.25-inch floppy disk drive and an optional second drive or hard drive (starting at 10 MB).

The system supported basic graphics through the Monochrome Display Adapter (MDA) for text output or the Color Graphics Adapter (CGA) with a 320x200 resolution and 4 colors. The audio was very basic, relying on the PC speaker, with no dedicated sound chip for advanced audio capabilities.

The IBM PC's flexibility and open architecture were key to its success. It offered compatibility with third-party software and hardware, setting a standard for personal computing. Its graphics and audio capabilities were modest, with no built-in advanced sound or high-resolution graphics, but the system's expandability and accessibility made it a vital part of the personal computing revolution. The IBM PC 5150 played a crucial role in making personal computers a mainstream tool for businesses and paved the way for the development of the PC clone market.



Characteristic	Specification
Year of Release	1981
CPU	Intel 8088
Number of Colors on Screen	Monochrome (MDA)
Number of Sound Channels	System Beep
Available Memory	16KB RAM, expandable to 256 KB
Display Resolution	320x200 (CGA)

Quick & Dirty OS

IBM wanted an operating system for their new project. This was actually a pet project, an experiment in using off-the-shelf components and test the waters of the new personal computer market. Truth be told, the powers-that-be at the company didn't really think much of the (micro)computer one of their teams was designing. In fact, this was the first time a rag-tag team was assembled by IBM, outside the sphere of strict corporate rules, regulations, suits, and company songs. After months and months of hard work, the team was ready. But they needed just one more component: an operating system. Surely, CP/M could have been a good candidate. But no, Digital Research would not agree to IBM's terms. And they called a company they thought they could trust: Micro-Soft.

Enter Bill: after hearing what IBM had to say, he said "of course, we do have an operating system". To that, Steve, his partner, almost had a heart-attack! They-did-not-have-an-operating-system. But Bill kept his poker face, and what he

uttered next was probably the biggest gamble ever in a business transaction between David (aka Micro-Soft) and Goliath (IBM): "of course, I do not wish to sell you the software but rather give it to you for a royalty for every machine you sell". The IBM guys agreed, thinking that the profits were not in software but rather in hardware. Keeping his poker face, Bill added: "And, of course, I would like to keep the rights to sell my operating system to other vendors". IBM, again, did not think much of that, so they agreed.

After the meeting, Bill visited a small company called Seattle Computer Products and, for US\$25,000, purchased the initial rights for the 86-Disk Operating System, which they renamed QDOS (Quick-and-Dirty Operating System). And thus, the first IBM, and Micro-Soft, launched into the stratosphere of personal computers!



Underestimating IBM

When IBM entered the personal computer market, with the 5150, Apple responded with whole-page ads in several publications, including The New York Times and Newsweek. At the time, Apple believed it had secured an unshakable position in the personal computer market, for both business and education, and that IBM, with its corporate image, could not understand the competition.

However, this would greatly backfire against Apple. Very soon, other companies would start producing IBM compatible machines, outselling Apple and expanding the marketshare of the "PC", as will all IBM clones will be known, a few years later. Also, the IBM name would be enough for most businesses, that trusted the corporate identity of that company. After all, it was common knowledge that "nobody got fired for choosing IBM".

Welcome, IBM. Seriously.

Welcome to the most exciting and important marketplace since the computer revolution began 35 years ago.

And congratulations on your first personal computer.

Putting real computer power in the hands of the individual is already improving the way people work, think, learn, communicate and spend their leisure hours.

Computer literacy is fast becoming as fundamental a skill as reading or writing.

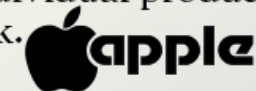
When we invented the first personal computer system, we estimated that over 140,000,000 people worldwide could justify the purchase of one, if only they understood its benefits.

Next year alone, we project that well over 1,000,000 will come to that understanding. Over the next decade, the growth of the personal computer will continue in logarithmic leaps.

We look forward to responsible competition in the massive effort to distribute this American technology to the world. And we appreciate the magnitude of your commitment.

Because what we are doing is increasing social capital by enhancing individual productivity.

Welcome to the task.



BBC Micro

The British Broadcasting Corporation (BBC) had recognised the potential of personal computers, as far back as the late 1970s. The government of UK, at the time, wanted to ensure that all students were educated in using computers, and it launched a very ambitious program called "Computer Literacy Project". To support the initiative, the BBC would produce a TV series focused on computers, while a new type of machine would be developed, to support schools.

Acorn Computers won the contract to design the BBC Micro, because of its innovative designs and experience in electronics and computer development. Their proposed solution was both cost-effective and powerful enough, ensuring it met all requirements set by the government.

The design of the BBC Micro was led by Chris Curry and Hermann Hauser, both co-founders of Acorn. Their engineering expertise and vision helped create a machine that would become highly regarded for its robustness,



versatility, and power. The computer featured a 6502 processor, up to 64 KB of RAM, and a rich set of graphics and sound capabilities, which made it suitable not only for education but also for personal and home use. The BBC Micro was available in several models, with the Model B being the most popular, offering additional memory and advanced features. The impact of the BBC Micro in the UK was immense, particularly in the educational sector. Schools across the country adopted the computer, and it became a central tool in teaching subjects like mathematics, science, and programming.

The machine was user-friendly and was designed to be accessible to students with minimal computer experience. Programs like Logo and BBC BASIC were central to its educational use, allowing students to learn programming skills early in their education.

Beyond education, the BBC Micro had a significant impact on personal use in the UK, where it became a popular choice for home computing. It competed directly with other personal computers of the time, like the Commodore 64 and the Sinclair Spectrum, and became a household name in the early 1980s.

Internationally, the BBC Micro was less successful due to its relatively high price and limited marketing outside the UK. However, its influence on the development of future personal computers was undeniable, as it set a standard for educational computing and programming in the UK. It also laid the groundwork for future Acorn developments, including the Acorn Archimedes, which would later shape the evolution of personal computing in the 1990s.

The legacy of the BBC Micro continues today, with the development of the BBC micro:bit series of programmable IoT devices, created to support education and to foster new generations of students interested in computer science.



Characteristic	Specification
Year of Release	1981
CPU	Zilog Z80 (2 MHz)
Number of Colors on Screen	8
Number of Sound Channels	4, Mono
Available Memory	16 KB (Model A)
Display Resolution	640x256

Epson HX-20

The IBM 5100 was the first portable computer, but the Osborne-1 is attributed as the first commercial computer that could be “easily” transported. However, both were too bulky, and they relied on external power source, reducing their usefulness for work “on the go”.

Epson Corporation, with a team led by Seiji Kato, decided to create a truly portable computer, with a small form-factor, that could rely on its own battery power. And that is exactly what they did, albeit with some compromises: they could not use a CRT screen like the competition, as that would increase the size of the machine, nor they could use floppy drives, for exactly the same reason.

The final product, the HX-20, was exceptionally small and only weighed 1.6 kg, with a built-in rechargeable battery. It had a full QWERTY keyboard, and a small 120x32 LCD display, the first of its kind on a commercial portable computer! For storage, it used a micro tape reader,



embedded in the machine, but could also be connected to an external device. One of the most remarkable features of the machine was the inclusion of a small printer within the unit, which used a 9-pin printhead.

Characteristic	Specification
Year of Release	1981
CPU	Hitachi 6301
Number of Colors on Screen	Monochrome
Number of Sound Channels	None
Available Memory	16 KB RAM
Display Resolution	120x32



The Sinclair ZX Spectrum, released in 1982, was a groundbreaking home computer developed by Sinclair Research in the United Kingdom. It was designed to be an affordable and accessible entry into the world of personal computing, targeting the burgeoning home market. The ZX Spectrum became one of the most iconic computers of the 1980s and played a significant role in popularizing computing and video games in the UK and abroad.

The name "Spectrum" for the Sinclair ZX Spectrum was chosen by Sir Clive Sinclair, the founder of Sinclair Research, as part of his strategy to make the computer appealing to a broad audience. The name was intended to reflect the machine's color display capabilities—a key selling point of the ZX Spectrum. The machine could display up to 8 colors (and later expanded with some hardware tricks to display more). Sinclair also wanted a name that would sound modern and high-tech, while still



being catchy and memorable. The name "ZX Spectrum" was simple, yet evocative, suggesting both the broad potential of the computer and the spectrum of possibilities it could offer for users, particularly in gaming.

Characteristic	Specification
Year of Release	1981
CPU	Zilog Z80A (3.5 MHz)
Number of Colors on Screen	8
Number of Sound Channels	1
Available Memory	16 KB RAM
Display Resolution	256 x 192

The machine featured a Zilog Z80A processor running at 3.5 MHz and came with 16 KB or 48 KB of RAM in the initial models, which could be expanded with peripherals. It offered a color display with 8 colors and a resolution of 256 x 192, which was impressive for its time, given its price point.

One of the most notable aspects of the ZX Spectrum was its rubber keyboard, which was often criticized for being unresponsive but helped keep the cost of the machine low. The ZX Spectrum was marketed primarily for gaming, and it quickly gained popularity in the home computing market. A large catalog of video games was developed for

the Spectrum, and it became one of the leading platforms for software developers in the 1980s.

The machine was very easy to program, thanks to the included BASIC, enabling a new generation of users to become involved in programming. Additionally, the machine’s sound capabilities (one channel of sound) were sufficient for the time and were often used in simple sound effects in games.

The computer was promoted in the US, in collaboration with TIMEX, as the Sinclair 1500 (image bottom left).

Today, the “Speccy”, as it was known, is considered one of the most important milestones in the development of personal computers.



Characteristic	Specification
Year of Release	1981
CPU	Zilog Z80A (3.5 MHz)
Number of Colors on Screen	8
Number of Sound Channels	1
Available Memory	16 KB RAM
Display Resolution	256 x 192

Commodore 64

The Commodore 64 is one of the most iconic computers ever released, building on the success and the lessons learned by the VIC-20. It followed the philosophy of Jack Tramiel of building very affordable, yet powerful “for the masses” machines.

Even though the VIC-20 was very capable as a machine (at the time of release), it was still a rushed product, based on the requirements and instinct of Jack Tramiel to release an inexpensive “mini” PET, to give Commodore a head start over the impending threat of a Japanese market invasion. With that in mind, the next machine would have to be much more than just an inexpensive computer, and be able to stand against the competition on equal -if not superior- footing. Therefore, it was decided that the new computer -initially known as VIC-40- would have to improve every aspect of its predecessor, if it was to really captivate the masses, while competing on all fronts with the competition. The development of the new computer was lead by a team



of engineers, including Robert Yannes who designed the legendary SID (Sound Interface Device) chip, that would give the Commodore 64 distinct and almost unparalleled sound capabilities. Also important was the work of Al Charpentier, who helped create the VIC-II (Video Interface Chip). Both the SID and the VIC-II offered significant advantages over the graphics and sound capabilities of the VIC-20, with much better audio quality and better resolution (320x200), along with support for hardware sprites and an enhanced color palette. The memory was also upgraded to 64KB, giving the machine much-needed space compared to the paltry 5KB of the VIC-20.

The Commodore 64, to help keep the costs down, retained the small form-factor and similar bread bin design of VIC-20. However, it was also supported with an array of external devices, including a tape-recorder for reading data (and, not unsurprisingly, the most important medium for games), and even a floppy drive. Like most personal computers of its time, the main output device was a domestic TV, and the Commodore 64 could directly be connected to it thanks to an internal modulator. However, Commodore released a series of monitors, like the Commodore 1701 and 1702, which provided much crisper quality and colour reproduction than a standard TV set.

To complement the machine, Commodore released an external floppy disk drive, the 1541. It was much faster than reading and writing to tapes, and -even though as expensive as a C64- it was very competitive when compared with drives for other computers.



Ingeniously, Commodore engineers actually used the same CPU as the Commodore 64 as the drive controller, thus producing the external storage device using components already available to Commodore.

Very soon, the Commodore 64 had an established user base in the millions, ensuring the machine long longevity and strong developer support.

Characteristic	Specification
Year of Release	1981
CPU	Zilog Z80A (4 MHz)
Number of Colors on Screen	Monochrome
Number of Sound Channels	None
Available Memory	64 KB
Display Resolution	52 characters x 24 lines

Commodore Price Wars

The Commodore 64, even though developed as an inexpensive, yet powerful personal computer, was weaponized by Jack Tramiel to completely obliterate the competition. Early on, Tramiel set his sights on Texas Instruments (TI), the company that—due to horizontal integration—had brought his calculator business to the brink of bankruptcy years ago. Tramiel was determined to settle old scores and used his mastery of aggressive pricing strategies to take down competitors, including Texas Instruments and Timex, while reshaping the personal computer industry.

Calculated Vendetta: Texas Instruments had been a thorn in Commodore's side since the late 1970s when the company entered the calculator market and undercut Commodore by manufacturing their own chips. Tramiel, a shrewd businessman, vowed never to let another company control his supply chain again. This lesson drove

Commodore's vertical integration strategy, where they acquired MOS Technology, the chipmaker responsible for the brains of the Commodore 64. By controlling production costs, Tramiel ensured Commodore could build powerful machines like the C64 at a fraction of the price its competitors paid for components. When the C64 launched in 1982, it was priced at \$595, already undercutting many rival systems. But this was just the beginning. Tramiel's ultimate goal wasn't just to sell computers—it was to bankrupt competitors. As demand for home computers grew, Commodore slashed the price of the C64 to \$300, then \$199. Texas Instruments, selling the TI-99/4A, was forced to retaliate, cutting its prices from over \$1,000 to under \$99 in a desperate attempt to compete. This strategy backfired disastrously for TI, which lost \$330 million on its computer division in 1983 and exited the market entirely. Tramiel had won.

Collateral damage: Another victim of Tramiel's tactics was Timex, whose Timex Sinclair 1000 was one of the cheapest computers on the market. Despite its affordability, the Timex Sinclair couldn't match the C64's graphics, sound, and game library, nor could Timex afford to keep up with the relentless price cuts. By late 1983, Timex also abandoned the home computer market. The fallout extended beyond hardware manufacturers. The Commodore 64's affordability and dominance also had unintended consequences for the video game industry, which was already teetering on the edge of collapse. As the C64 gained traction, consumers shifted their attention from dedicated gaming consoles, like Atari's 2600, to home computers that could serve multiple purposes, including gaming. The glut of low-quality video game cartridges, combined with consumers flocking to platforms like the C64 for superior gaming experiences, contributed

to the video game crash of 1983. Retailers were left with unsold inventory, and many video game companies, including Atari, faced massive losses or bankruptcy.

Jack Tramiel's strategy to "weaponize" the Commodore 64 was both a triumph and a tragedy for the industry. On one hand, it brought affordable computing to millions of homes, democratizing access to technology and transforming the gaming landscape. On the other hand, it decimated competition, destabilized the market, and accelerated the decline of many companies and the video game industry itself. Tramiel's ruthless tactics reshaped the industry but left a trail of destruction in their wake—a stark reminder of the cost of winning at all costs.

Aftermath: Even though Jack Tramiel eventually "won" the price wars, in truth he accelerated his own downfall. Very soon he would be forced to resign from Commodore, the company he founded and devoted most of his life after WWII, and take the reins of another company - ironically, one he helped destroy. Very soon, Tramiel would be heading Atari!



Franklin Ace

The **Franklin Ace 100**, released in 1982, was a notable personal computer that gained attention for being one of the first successful clones of the **Apple II**, a leading home computer in the late 1970s and early 1980s. The Franklin Ace was created by **Franklin Computer Corporation**, a company based in **Pennsylvania, USA**. Franklin initially focused on producing replacement parts for the Apple II, but soon realised that they could create an Apple II “compatible” machine, for a much lower selling price. They managed to do that by using many of the same components, including the **6502 processor** and graphics chips. At first, the computer was a great success, because of its Apple II compatibility and lower price.



However, the Franklin Ace 100’s success was short-lived. **Apple Inc.** filed a **lawsuit** against Franklin in 1983 for patent infringement, as the Ace 100 was essentially a clone of the Apple II. The legal battles ultimately forced Franklin out of the personal computer market by the mid-1980s.

Characteristic	Specification
Year of Release	1982
CPU	MOS 6502 (1.02 MHz)
Number of Colors on Screen	6
Number of Sound Channels	1
Available Memory	48 KB RAM
Display Resolution	280x192

Jupiter Ace

The Jupiter Ace, released in 1982, was a unique personal computer created by Richard Altwasser and Steven Vickers, both former engineers at Sinclair Research. Manufactured by Jupiter Cantab, a small British company, the Ace stood out from other home computers of the era because it was designed to use Forth, a stack-based programming language, instead of the more common BASIC. This choice was intended to appeal to advanced programmers and hobbyists who valued Forth's efficiency and speed for writing compact, high-performance programs.

The design of the Jupiter Ace bore similarities to earlier Sinclair machines like the ZX81, with a small, compact case and a rubber membrane keyboard, but it introduced notable enhancements. Powered by a Zilog Z80A CPU running at 3.25 MHz, the Ace offered 3 KB of RAM (expandable to 49 KB) and supported a monochrome display with a resolution of 32 columns by 24 rows of text or graphics.



Even though it had significant advantages over the ZX81, it never managed to capture the attention of the market. With the company unable to compete with the models that were flooding the market, it soon discontinued its lines.

Characteristic	Specification
Year of Release	1982
CPU	Zilog Z80A (3.2 MHz)
Number of Colors on Screen	Monochrome
Number of Sound Channels	None
Available Memory	3 KB
Display Resolution	32x24 (text)

Compaq Portable

The Compaq Portable, released in 1983, was a groundbreaking personal computer and the first IBM PC-compatible portable system. Developed by Compaq Computer Corporation, a Texas-based company founded by Rod Canion, Jim Harris, and Bill Murto, the Compaq Portable revolutionized the computing industry by offering full compatibility with the IBM PC standard, while also being portable—a concept that was novel at the time.

The computer was housed in a sturdy, suitcase-like case that weighed approximately 12.7 kg and featured a built-in 9-inch monochrome CRT display and a detachable keyboard. It used an Intel 8088 processor running at 4.77 MHz, the same CPU as the IBM PC, and came with 128 KB of RAM (expandable to 640 KB). The machine included two 5.25-inch floppy disk drives for storage and could run MS-DOS, ensuring full compatibility with the growing library of IBM PC software.

The design of the Compaq Portable was innovative for its time. While its weight made it more "luggable" than truly portable by today's standards, it was significantly more mobile than the IBM PC, which required a dedicated desk setup. This portability made it appealing to business professionals who needed to carry their work with them, such as consultants and salespeople.



One of the key strengths of the Compaq Portable was its reverse engineering of IBM’s BIOS (Basic Input/Output System), which enabled it to run all software developed for the IBM PC without infringing on IBM’s intellectual property. This clever strategy allowed Compaq to compete directly with IBM in the lucrative business computing market. Its compatibility also set the stage for the rise of the PC clone industry, which eventually overtook IBM as the dominant force in the personal computer market.

The Compaq Portable was a commercial success, selling over 53,000 units in its first year and generating significant revenue for the young company. Its success demonstrated the viability of

IBM-compatible systems and helped establish Compaq as a major player in the PC industry.

Although it was eventually surpassed by lighter and more advanced portable computers, the Compaq Portable remains an important milestone in

computing history. It demonstrated the value of compatibility, portability, and innovation, helping to shape the personal computer market as we know it today. It also cemented the role of Compaq as a maker of quality computers, setting the road for the company to become a dominant presence in the personal computer market for years to come.

In summary, Compaq’s role in the **PC clone** industry was transformative. By reverse-engineering IBM’s PC and creating a compatible machine, Compaq not only contributed to the growth of the personal computer industry but also paved the way for the widespread use of affordable PCs that eventually became a part of everyday life.

Characteristic	Specification
Year of Release	1983
CPU	Intel 8088 (4.77 MHz)
Number of Colors on Screen	Monochrome
Number of Sound Channels	None
Available Memory	129 KB RAM (expandable to 640)
Display Resolution	80 columns x 25 rows (text)



Reverse Engineering

Reverse engineering is when you take something apart to understand how it works, without having the original design. In computers, this could mean studying a program or hardware and figuring out how it functions. It's a way to learn from existing products, improve them, or make new ones that work with older systems.

A famous example of reverse engineering in computers is Compaq's success against IBM in the 1980s. IBM released its first personal computer, which became very popular. But Compaq wanted to make a similar computer without copying IBM directly. They used reverse engineering to study IBM's BIOS, the software that made the IBM PC run. By understanding how the BIOS worked, Compaq recreated it in their own code. This allowed them to create the Compaq Portable, a computer that could run the same software as IBM's. This helped Compaq and other companies make computers that were compatible with

IBM's, leading to the rise of PC clones—computers that were similar to IBM's but made by different companies.

Reverse engineering was also important in the world of video games. In the 1980s, Atari had a popular video game console, the Atari 2600. Other companies wanted to create their own games for it, so they used reverse engineering to figure out how Atari's system and cartridges worked. This allowed them to make their own games for the console. While this helped the video game market grow, it also caused problems. Many low-quality games flooded the market, which led to the video game crash of 1983 when people got tired of poor-quality games. Still, reverse engineering played a big role in the video game industry's growth. Even though it can raise legal issues, reverse engineering has been a key tool in technology, driving competition and innovation.

IBM PC/XT

Following on the incredible, yet predictable success of the original IBM PC, the PC/XT was the first model to include a built-in hard drive, setting a new industry standard for personal computers. It also included an 8-slot expansion bus, offering unique expandability to the machine.

Performance-wise, it was not significantly faster than the model it was replacing. However, it was a much-improved version of an already established personal computer, that would -in a short period of time- dethrone most other vendors from their positions, including Apple, and set one industry standard after the other.

Very soon, others would mimic the success of the IBM PC/XT and bring to market cheaper, faster, compatible computers.



Characteristic	Specification
Year of Release	1983
CPU	Intel 8088 (4.77 MHz)
Number of Colors on Screen	16 (CGA)
Number of Sound Channels	1
Available Memory	128 KB RAM
Display Resolution	320x200 (CGA)

Oric-1

The Oric-1 was a British home computer created by Oric Products International, a subsidiary of Tangerine Computer Systems, and released in 1983. It was developed to compete with the highly successful Sinclair ZX Spectrum in the growing home computer market. The Oric-1 was designed to be affordable and appeal to beginners, while offering better hardware features than its main rival.

The Oric-1 was powered by the MOS Technology 6502A CPU, running at 1 MHz, and came in two versions: one with 16 KB of RAM and another with 48 KB of RAM. It supported 8 colors on screen and had 1 sound channel with three programmable voices, offering improved audio capabilities compared to the ZX Spectrum. The computer's maximum display resolution was 240x200 pixels, which was competitive for its time. One of the Oric-1's main advantages was its built-in BASIC programming language, which included more advanced features than the ZX Spectrum's BASIC. It also featured a more tactile keyboard,



better sound capabilities, and a robust design that supported peripherals like printers and external storage devices. Additionally, the Oric-1 included a range of built-in error messages, which helped beginners debug programs more easily.

Characteristic	Specification
Year of Release	1983
CPU	MOS 6502A (1 MHz)
Number of Colors on Screen	8
Number of Sound Channels	1
Available Memory	48 KB RAM
Display Resolution	240x200

Acorn Electron

The Acorn Electron was a British home computer created by Acorn Computers, released in 1983, as a cost-effective alternative to their highly successful BBC Micro. It was developed to target the budget-conscious home computer market, competing primarily with the Sinclair ZX Spectrum and the Commodore 64. The Electron aimed to bring the BBC Micro's power and compatibility to a broader audience by offering a more affordable and compact device.

One of the main advantages of the Acorn Electron was its software compatibility with the BBC Micro. Users could run most BBC Micro programs, including educational and productivity software, as well as games, making it a versatile choice for families. It also featured a sturdy keyboard and an integrated BASIC interpreter, which was highly regarded for its ease of use and power. However, the Electron faced significant challenges. Its launch was



plagued by production delays, which meant it missed the critical 1983 Christmas sales period, allowing competitors like the ZX Spectrum to solidify their market dominance. Additionally, while it was compatible with BBC Micro software, its hardware lacked the speed and expandability of its predecessor, which made it less attractive to power users.

Characteristic	Specification
Year of Release	1983
CPU	MOS 6502A (2 MHz)
Number of Colors on Screen	8
Number of Sound Channels	1
Available Memory	32 KB RAM
Display Resolution	640x256

Atari 600XL

The Atari 600XL was a home computer created by Atari, Inc. and released in 1983 as part of the Atari 8-bit computer line. It was developed to replace the earlier Atari 400, offering a more compact and affordable machine to compete with rivals like the Commodore 64 and Sinclair ZX Spectrum. The 600XL was designed for general home use, including gaming, education, and light productivity.

Some of the main advantages of the Atari 600XL was its advanced graphics and audio capabilities, that allowed an astonishing 256 colours on screen, the great quality of its sound, thanks to the POKEY chip, and the compatibility with Atari's extensive library of software and peripherals, including games, productivity tools, and educational programs. The compact and modern design of the 600XL, along with its full-travel keyboard, made it more user-friendly than its predecessor, the Atari 400. Additionally, it included a built-in BASIC interpreter, allowing users to



program their own applications directly. Despite its strengths, the Atari 600XL faced stiff competition from the Commodore 64, which offered more RAM (64 KB) and a similar price point.

Characteristic	Specification
Year of Release	1983
CPU	MOS 6502C (1.79 MHz)
Number of Colors on Screen	256
Number of Sound Channels	4
Available Memory	16 KB RAM
Display Resolution	320x192

Olivetti M24

Pier Giorgio Perotto, a visionary electrical engineer, inventor, and computer pioneer, played a pivotal role in shaping modern computing. He was best known for creating the Programma 101, widely regarded as the world's first commercially available personal computer, although it was marketed at the time as a sophisticated calculating machine. This groundbreaking invention, which debuted in 1965, demonstrated Perotto's ability to blend technological innovation with user-centric design, setting the stage for future developments in computing.

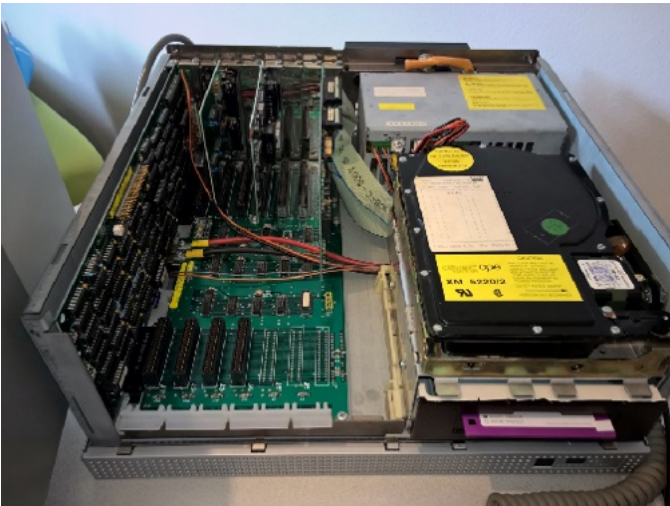
Recognizing the growing dominance of IBM's PC standard, Olivetti made the strategic decision to enter the IBM-compatible market, combining its expertise in design and manufacturing with a focus on offering superior performance and affordability. Olivetti's entry into the PC-compatible space was driven by a desire to leverage its reputation for high-quality products while addressing the limitations of existing IBM systems. The company identified



a gap in the market for more powerful, versatile, and competitively priced machines that could appeal to both business and home users. With a long-standing commitment to innovation, Olivetti tasked its engineering teams with creating a machine that would surpass the IBM PC in performance, graphics capabilities, and user experience. This effort culminated in the release of the Olivetti M24 in 1983, which became one of the fastest and most advanced IBM-compatible systems of its time. The

decision to compete in this space marked a bold move for Olivetti, showcasing its ability to innovate.

The Olivetti M24 was based on an Intel 8086 processor running at 8 MHz, which was significantly faster than the 4.77 MHz Intel 8088 used in IBM PCs of the time, offering superior performance. The Olivetti M24 came with 128 KB of RAM, expandable up to 640 KB, providing enhanced multitasking and support for memory-intensive tasks. Its storage options included a 360 KB 5.25-inch floppy drive in the base model, with configurations for dual floppy drives or a 10 MB hard disk for increased capacity. The M24 supported high-resolution CGA graphics with a resolution of up to 640 x 400, significantly surpassing the IBM PC's standard 320 x 200 CGA graphics, making it ideal for business and graphical applications. Its modular and compact design featured a detachable keyboard, offering versatility and ergonomic benefits. As an IBM PC-compatible system, the M24 could run most IBM PC software, though its slightly different BIOS occasionally led to minor compatibility issues. The Olivetti M24 outshined much of its competition with several advantages. Its 8 MHz 8086 processor made it one of the



fastest IBM-compatible computers of its time, outperforming the original IBM PC. The M24's superior graphics resolution appealed to business users needing high-quality visuals for charts and presentations. Its flexible configurations for storage and RAM allowed it to cater to a wide range of users, from small businesses to power users. Despite its advanced features, the M24 was competitively priced, offering significantly better value for performance compared to IBM PCs.

The Olivetti M24 was highly successful, becoming one of the best-selling European PCs of the 1980s, cementing its market position.

Characteristic	Specification
Year of Release	1983
CPU	Intel 8086
Number of Colors on Screen	16 (CGA)
Number of Sound Channels	1
Available Memory	512 KB RAM
Display Resolution (Max)	640x200 (CGA)

A Walk in the PARC

Apple was, for a short period of time, the market leader in personal computers, at least in the USA. However, the company was betting everything on the Apple II, that was starting to show its age, when IBM entered the market and managed to grab the hearts and minds of businesses almost everywhere. Apple needed to innovate again, and this time, they looked outside the company for inspiration. Steve Jobs, the ever-charismatic and relentless visionary, took what could only be described as one of the most expensive strolls in tech history—a walk through Xerox PARC (Palo Alto Research Center). Xerox, a giant in photocopiers at the time, had this brilliant research lab where some of the sharpest minds in computing were cooking up futuristic ideas. But here's the thing: Xerox didn't quite know what to do with all this innovation. They were essentially sitting on gold, shrugging, and saying, "Eh, it's shiny, but can it make more copies?"

Enter Steve Jobs, with his knack for spotting what others missed. Apple struck a deal with Xerox, offering them a

chance to invest in Apple (which would later prove ridiculously profitable) in exchange for a peek inside PARC. Jobs, along with a small group of Apple engineers, got a firsthand demo of something that blew their collective minds: the Graphical User Interface (GUI).

As they walked through the lab, Jobs saw something almost magical—computers that could be controlled using a mouse and icons instead of cryptic command-line text. Imagine moving a little arrow on the screen and clicking on visual "folders" like you were, well, organizing an actual desk. This was revolutionary stuff at a time when most computers greeted you with a blinking cursor and an unspoken, "Good luck figuring me out!"

Jobs was *floored*. Legend has it he practically started bouncing off the walls, asking the Xerox engineers, "Why aren't you doing anything with this?" To Jobs, it was as if he'd just walked into the future, while Xerox's execs seemed more focused on their next batch of copier toner.

The truth was, the engineers working at the Xerox PARC were not thrilled with Jobs visiting their premises, but they truly believed he -and his associates- would not be able to understand what they were showing them. However, to the terror of at least some of them, both Steve Jobs and his associates, including the charismatic programmer Bill Atkinson, started asking all the right questions. And soon, very soon, they would be sitting on their own desks, at Apple, working on the next big thing (and some years later, on the NeXT bit thing!), hugely improving everything they saw!

This “walk” didn’t just blow Jobs’ mind—it set him on a mission. The GUI became the foundation of Apple’s next big thing: the Lisa (1983), and later, the Macintosh (1984). While the Lisa didn’t take off (it was too pricey), the Mac became a cultural icon, bringing the GUI—and personal computing—into the mainstream.

So, what started as a casual stroll through Xerox PARC became a sprint toward the future of computing. Jobs didn’t just see innovation; he saw its potential to change the world, proving once again that sometimes the biggest ideas start with a simple walk... or a really well-timed visit to someone else's lab.



Apple Lisa

The Apple Lisa was a groundbreaking personal computer created by Apple Inc. under the direction of Steve Jobs (initially) and a team of engineers led by John Couch. Released in January 1983, it was developed to introduce the world to the Graphical User Interface (GUI), a concept inspired by Steve Jobs' visit to Xerox PARC. The Lisa's goal was to make computers more intuitive and accessible to professionals and businesses by replacing complex command-line interfaces with a user-friendly GUI and a mouse.

The Lisa was powered by the Motorola 68000 CPU, running at 5 MHz, and came with 1 MB of RAM, a significant amount for the time. It supported a monochrome display with a maximum resolution of 720x364 pixels but lacked color capabilities. Sound capabilities were minimal, with 1 sound channel, as the Lisa focused more on productivity than multimedia. For storage, the Lisa relied on two "Twiggy" floppy drives,



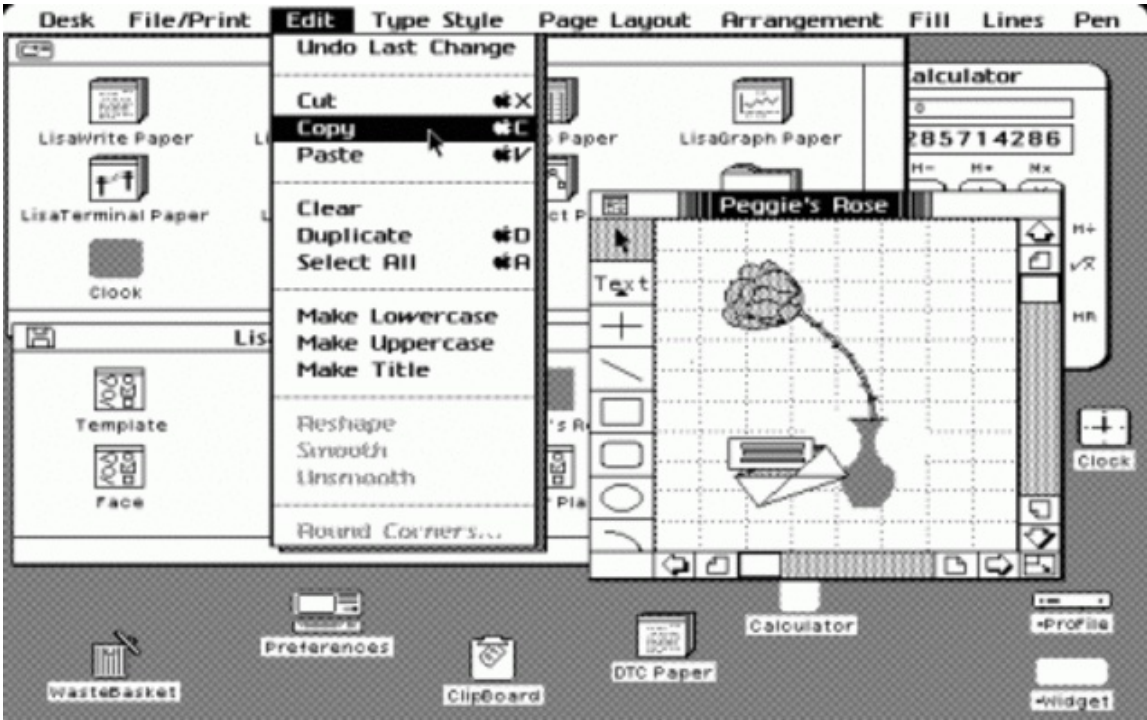
which were very unreliable and slow, but it also supported an external 5 MB hard drive (picture above).

One of the main advantages of the computer, apart from its GUI, was the inclusion of the Lisa Office System, a set of 7 applications (LisaWrite, LisaCalc, LisaDraw, LisaGraph, LisaProject, LisaList and LisaTerminal), ideal for business use.

However, the Lisa faced significant challenges. Its primary competitor, the IBM PC, released in 1981, was much cheaper and quickly dominated the business market. At the same time, Lisa's high price of nearly \$10,000 USD made it unaffordable for most consumers and small businesses. Additionally, its performance was sometimes sluggish, and its proprietary nature limited third-party software support.

A lot of the problems that plagued Lisa were attributed to the involvement of Steve Jobs: many of the decisions Steve Jobs insisted on, had a negative impact on the machine

and drove the price upwards, while causing havoc to the deadlines the team had set -several times- in finishing the machine. Eventually, Steve Jobs was exiled from the Lisa project entirely (see "A founder in exile, part 1").



Characteristic	Specification
Year of Release	1983
CPU	Motorola 68000 (5 MHz)
Number of Colors on Screen	Monochrome
Number of Sound Channels	1
Available Memory	1 MB RAM
Display Resolution	52 characters x 24 lines

A founder in exile, Part 1

Steve Jobs, while taking his famous walk in PARC, recognised the potential the GUI would have in personal computers. Almost immediately, he set the entire company on the task of creating their own next-generation computer with a graphical user interface, that would blow away the competition. However, before the Lisa, as the new product was to be called, was even released, and due to his disruptive and confrontational leadership style, he was ousted from the project! Jobs, the original champion of the Lisa, with his relentless perfectionism and tendency to alienate team members created internal friction. John Couch, the head of the Lisa division, and other senior leaders grew frustrated with Jobs' behavior, which they believed was hindering progress.

Apple's then-CEO, Mike Markkula, made the difficult decision to remove Jobs from the project. Jobs was reassigned to work on what was then a lower-profile effort—the Macintosh project, led by Jeff Raskin. Jobs quickly took

over the Macintosh team, transforming it into a skunkworks-style operation that would eventually produce the groundbreaking Macintosh 128K in 1984.

The repercussions for Apple were mixed. While the Lisa launched in 1983 as a technical marvel, its exorbitant price and limited commercial success hurt Apple's reputation. On the other hand, Jobs' exile from Lisa allowed him to focus entirely on the Macintosh, which became a defining product for Apple and cemented his legacy as a visionary.

This period marked an important turning point in Jobs' career, showcasing both the challenges of his leadership style and his ability to channel his energy into transformative projects. It also set the stage for the power struggles that would later lead to Jobs' departure from Apple in 1985.

Transplanting the Mac

It was just after Christmas in 1980 when Bud Tribble, a young software designer and project manager, challenged Burrell Smith, a self-taught hardware engineer, to install a more powerful microprocessor on a small, low-cost computer they were developing under Jef Raskin's direction. Raskin, a visionary and somewhat eccentric computer scientist, had envisioned the Macintosh as a budget-friendly, user-friendly machine powered by a modest Motorola 6809 processor. However, Bud, who had a knack for pushing boundaries, thought they could aim higher.

Burrell Smith, known for his inventive genius and love of tackling impossible engineering problems (not to mention pineapple pizza), eagerly accepted the challenge. Over the course of a few intense days, he not only figured out how to integrate the far more powerful Motorola 68000 processor—a 16-bit powerhouse typically reserved for high-end workstations—but also managed to significantly reduce the overall cost of the machine's components. This feat was

nothing short of miraculous, as the 68000 was leagues ahead of the original plan and offered an exponential increase in performance.

Steve Jobs would soon learn about this pet project, and the fact that the same microprocessor as the Lisa was working on it. Having been exiled from the Lisa project, Steve would soon take over and lead the development of the new machine.

The Macintosh, originally conceived as Raskin's humble low-cost computer, would become Steve Jobs' new obsession. Jobs soon wrested control of the project from Raskin, transforming it into his vision of a revolutionary machine: a sleek, powerful personal computer with a graphical user interface and a price tag that would (hopefully) bring it to the masses.

This pivotal moment marked the Macintosh's shift from a modest experiment to the ambitious project that would redefine personal computing.

Commodore SX-64

Commodore, a pioneer in personal computers, wanted to create a portable computer that would have no compromises, and still keep the costs down to an affordable level for the average business. The Commodore SX-64, also known as the Executive 64, managed to become the first color portable computer, released at the end of 1983. In truth, it was a transportable, since it had no internal battery, and thus, no autonomy away from a power outlet.

The computer was based on a modified version of the immensely popular Commodore 64 (C64), designed for business professionals who needed computing power on the go. The SX-64 featured a built-in 5-inch color CRT screen, a 1541 floppy disk drive, and a detachable keyboard that doubled as a cover for the unit. With its briefcase-like design, the SX-64 weighed around 10 kg—a significant weight by modern standards, but revolutionary at the time for portability. Its compact design retained most



of the hardware capabilities of the Commodore 64, ensuring compatibility with the vast library of C64 software.

The SX-64 was much faster, smaller, lighter than the competition, like the Osborne-1 or the Kaypro II, and it also included a color instead of a monochrome screen.

The SX-64 ran Commodore BASIC V2, just like the Commodore 64, and used the KERNAL ROM for system functions. Programs were loaded from its built-in 1541 floppy disk drive or external storage devices.

Architecturally, the SX-64 shared much with the C64,



including 64 KB of RAM and compatibility with the same software and peripherals. However, there were key differences: the SX-64 had a built-in floppy drive and color screen, whereas the C64 required external components for these functions. While the SX-64 was portable, it was also bulkier and significantly more expensive than the standalone C64.

The SX-64 was marketed primarily to business professionals. Its color display and portability made it a good option for presentations and on-site work, allowing professionals to demonstrate software or handle tasks at trade shows, client offices, and remote locations. It was also useful for data management, handling spreadsheets and office tasks using its integrated floppy drive. Despite these strengths, its weight, limited screen size, and reliance on

external power reduced its practicality. Additionally, it faced stiff competition from other business portables like the IBM 5155, which offered different features tailored more directly to professional users.

Despite its limited commercial success, the SX-64 remains an important technological milestone as the first color portable computer. It combined the power of the Commodore 64 with innovative portability, paving the way for the development of laptops and other mobile computing devices in the decades to come. Its legacy endures as a symbol of early portable computing and the growing demand for technology that could be taken on the go.

Characteristic	Specification
Year of Release	1983
CPU	MOS 6502 (1.02 MHz)
Number of Colors on Screen	16
Number of Sound Channels	3
Available Memory	64 KB RAM
Display Resolution (Max)	320x200

In this chapter...

In **Chapter 5** we witnessed the birth of the personal computer, and the meteoric growth of the new industry, with (almost) new models arriving every month from various vendors. At first, every company created its own standard, incompatible with machines from others, yet fighting to grab hold of a significant marketshare to attract developers. Apple II was the first mass-market personal computer, followed closely by Commodore and its PET, and with the TRS-80 shortly after that, to form the "Holy Trinity" of the late 1970s. Soon, companies will be innovating to catch the imagination -and the pockets- of ordinary people everywhere. Sinclair will bring the first truly low-cost computer to the masses, while IBM will break tradition and introduce a computer based on standard industry components.



• Chapter 6 •

Rising to Crash

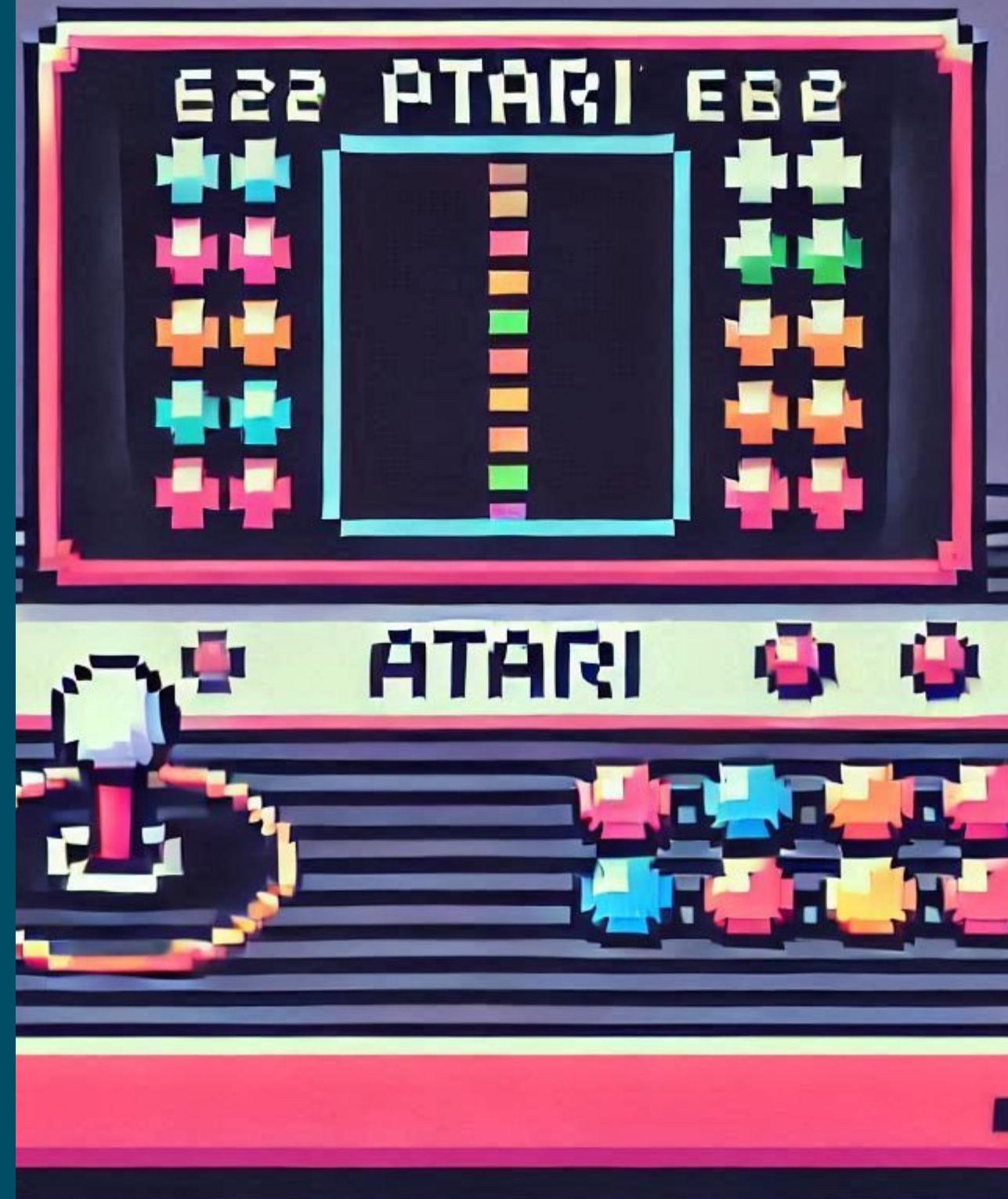
"Radical innovation is difficult to fund. It seems scary. And the really radical thing seems even more scary"

Nolan Bushnell

Introduction

Video games existed years before the rise of the first personal computers from Apple, Commodore and Tandy. Initially, game development was the work of companies creating coin-operated (arcade) machines, and, later, companies that developed their own game consoles. Individuals started creating and selling their own games, mainly via mail order or through zip-locked bags in (their) local stores. By the early 1980s, there was a booming video game industry, developing for both consoles and computers. Almost everyone -including at least one cereal company!- was developing video games, bringing the quality down, while the quantity was rising to incredible heights. And then came a game called E.T., the straw that broke the camel's back...

In this chapter, we will learn more about the people and the companies that revolutionised video games in the 1970s and 1980s.



Colossal Cave Adventure

In 1976, Will Crowther, a cave explorer, decided to create a text video game, where the player could explore an underground cave. It was originally called Cave Adventure, or ADVENT, and later renamed Colossal Cave Adventure. Don Woods expanded the game in 1977, offering more locations, more items and better descriptions.

The game’s premise is simple yet engaging: players explore a mysterious cave, solve puzzles, and collect treasures while navigating hazards like pits, trolls, and an infamous grue. With no graphics, gameplay relied entirely on text descriptions and simple commands like "go north" or "take lamp," challenging players' imaginations and problem-solving skills.

Cave Adventure is widely regarded as the first interactive fiction game and a precursor to the adventure game genre. Its success sparked the development of countless text-based games and influenced iconic titles like Zork, the creation of companies such as Magnetic Scrolls, as well as

```
.run adven

WELCOME TO ADVENTURE!!  WOULD YOU LIKE INSTRUCTIONS?

yes

SOMEWHERE NEARBY IS COLOSSAL CAVE, WHERE OTHERS HAVE FOUND FORTUNES IN
TREASURE AND GOLD, THOUGH IT IS RUMORED THAT SOME WHO ENTER ARE NEVER
SEEN AGAIN.  MAGIC IS SAID TO WORK IN THE CAVE.  I WILL BE YOUR EYES
AND HANDS.  DIRECT ME WITH COMMANDS OF 1 OR 2 WORDS.  I SHOULD WARN
YOU THAT I LOOK AT ONLY THE FIRST FIVE LETTERS OF EACH WORD, SO YOU'LL
HAVE TO ENTER "NORTHEAST" AS "NE" TO DISTINGUISH IT FROM "NORTH".
(SHOULD YOU GET STUCK, TYPE "HELP" FOR SOME GENERAL HINTS.  FOR INFOR-
MATION ON HOW TO END YOUR ADVENTURE, ETC., TYPE "INFO".)

- - -

THIS PROGRAM WAS ORIGINALLY DEVELOPED BY WILLIE CROWTHER.  MOST OF THE
FEATURES OF THE CURRENT PROGRAM WERE ADDED BY DON WOODS (DON @ SU-AI).
CONTACT DON IF YOU HAVE ANY QUESTIONS, COMMENTS, ETC.

YOU ARE STANDING AT THE END OF A ROAD BEFORE A SMALL BRICK BUILDING.
AROUND YOU IS A FOREST.  A SMALL STREAM FLOWS OUT OF THE BUILDING AND
DOWN A GULLY.

east

YOU ARE INSIDE A BUILDING, A WELL HOUSE FOR A LARGE SPRING.

THERE ARE SOME KEYS ON THE GROUND HERE.

THERE IS A SHINY BRASS LAMP NEARBY.

THERE IS FOOD HERE.
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the birth of an entire genre called “adventure games”. It is well accepted that the game was so inspiring that Roberta Williams decided to create her own video games, after playing -for days- the game on her husband’s computer.

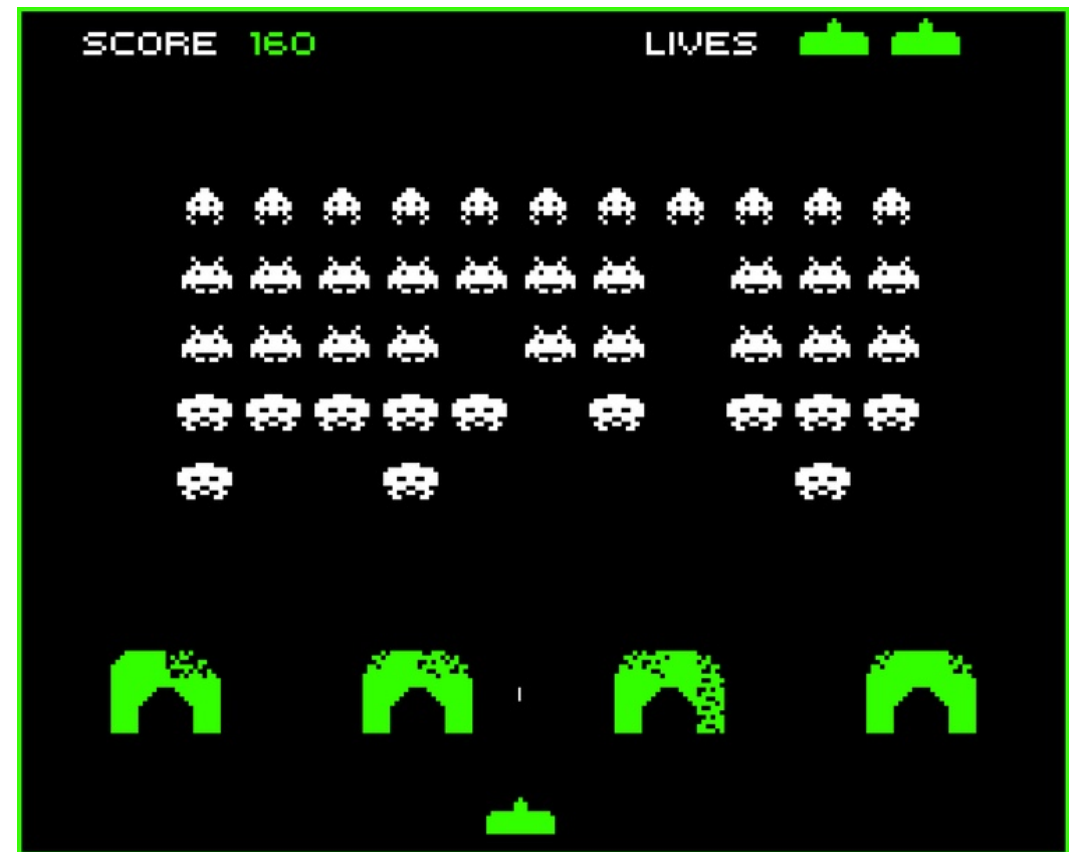
Game details:	
Year of Release	1976
Systems:	PDP- 10 (initially)
Genre:	Text Adventure
Developer:	Will Crowther
Publisher:	-

SPACE INVADERS

Space Invaders, released in 1978 by Taito and designed by Tomohiro Nishikado, is one of the most iconic and groundbreaking arcade games of all time. It was a key catalyst in the rise of the video game industry, establishing many of the conventions that would shape the genre for years to come.

The inspiration behind *Space Invaders* came from a combination of elements that were popular in entertainment and technology at the time. Nishikado was inspired by the success of earlier arcade games like *Pong* and *Breakout*, but wanted to create something more engaging and dynamic. He drew influence from classic science fiction films like *War of the Worlds*, where Earth is under attack by alien invaders. The core concept of *Space Invaders* involves players defending Earth from waves of descending extraterrestrial invaders.

Nishikado faced several technical challenges during the development of the game. At the time, the hardware for



arcade games was still quite primitive. The processors available had limited power, and memory was scarce. One of the major hurdles was creating a game that could have moving characters and enemies, as well as multiple objects interacting on screen at the same time. This required extensive optimization of the hardware and the game's programming to allow the enemies to move in predictable patterns while maintaining smooth gameplay.

One of the notable technical features of *Space Invaders* was its ability to simulate color in a time when most arcade machines used monochrome displays. This was done with the use of color overlays under the screen!

Gameplay in *Space Invaders* was simple yet captivating. Players control a laser cannon that moves left and right along the bottom of the screen, shooting at waves of descending aliens. The invaders move in unison, gradually descending lower and lower, and the player's task is to shoot them all before they reach the bottom. Players are also protected by a series of barriers, which can be destroyed by enemy fire. As the game progresses, the invaders speed up, increasing the challenge. The gameplay is fast-paced, requiring players to balance quick reflexes with strategic use of cover.



earlier arcade games that were based on more simplistic concepts like bouncing balls or hitting paddles. The game's immense popularity even sparked an unproved myth in Japan that *Space Invaders* caused a nationwide coin shortage.

The success of *Space Invaders* sparked the golden age of arcade games, influencing numerous titles that followed. Its popularity led to the creation of early home ports for various consoles and computers. The Atari 2600 version (image centre), released in 1980, became one of the first major arcade-to-console ports and was met with huge success!

Space Invaders was innovative for several reasons. It was one of the first games to feature a "high score" system, encouraging players to compete for the highest score and adding a layer of replayability. Additionally, its increasing difficulty and the use of an advancing enemy wave introduced a sense of tension and urgency, making the game both thrilling and challenging. The concept of moving enemies, along with the use of barriers and strategic shooting, was also a significant departure from

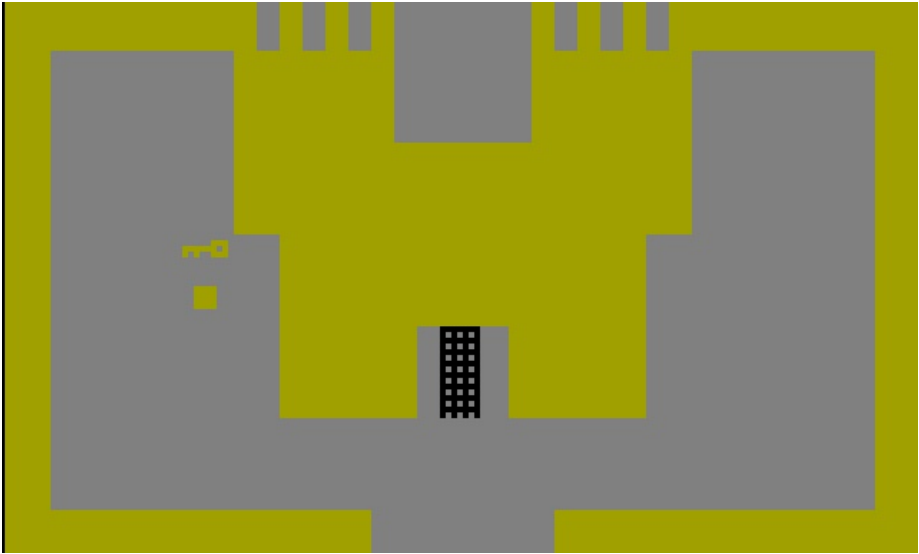
Game details:	
Year of Release	1978
Systems:	Arcade, Atari 2600
Genre:	Shoot'em up
Developer:	Tomohiro Nishikado
Publisher:	Taito

Adventure

In 1980, Warren Robinett created *Adventure* for the Atari VCS, a revolutionary game that brought exploration and puzzle-solving to home consoles. Inspired by the text-based *Colossal Cave Adventure*, it was the first action-adventure video game, offering players a graphical quest to recover a stolen chalice and return it to the golden castle.

Adventure introduced groundbreaking gameplay elements, including an open world, hidden objects, and enemies like the infamous dragons, which resembled animated ducks. Players could wield a sword, navigate mazes, and use items like keys and a magical bridge to progress through the game.

The game is also famous for containing the first-ever "easter egg" in video game history. Frustrated by Atari's policy of not



crediting developers, Robinett secretly added a hidden room displaying the message, "Created by Warren Robinett." This act of rebellion was discovered by players after the game's release, adding an extra layer of intrigue to its legacy.

Adventure was a milestone in gaming, paving the way for open-world exploration and inspiring future classics like *The Legend of Zelda*.

Game details:	
Year of Release	1979
Systems:	Atari 2600
Genre:	Action Adventure
Developer:	Warren Robinett
Publisher:	Atari

Impact of Adventure

One fateful day, Ken Williams brought home a teletype terminal. He had to work on a project for an accounting firm, and he wanted to be able to work at home for the long hours required. He quickly found a game called "Adventure", and he spent some time playing with it. Once Roberta, his wife, saw the game, she was immediately hooked, playing over and over again, taking notes and drawing maps on paper, playing and replaying the game until she reached the perfect score. By then, Roberta, was set in her life as a humble housewife, raising their kids. But, at that moment, when she concluded the Adventure game, the skies parted, light came down, the angel chorus started singing: she had an epiphany! Ken found her scribbling on paper, designing new maps, new drawings, connecting dots (literally and metaphorically) on paper and in her head. Ken asked "what are you doing there?". She replied "I am designing my own game. It will have a mystery, of course, focus in a house instead of a cave. And, it will have graphics. And of course, you will program it!".



Sierra On-Line

Ken and Roberta Williams were an ordinary couple, with Roberta taking care of the household, while Ken was working as a programmer. This all changed, after Roberta was captivated by the original "Adventure" game, resulting in her wish to create her own game, "Mystery House" (see "Mystery").

Mystery House (1980), was a text-based adventure game with a revolutionary twist: crude yet captivating black-and-white graphics. Roberta designed the story and puzzles, while Ken handled the programming. They sold the game by copying floppy disks and packaging them in plastic bags, distributing them through a local software store. The game's success was unprecedented—it sold over 10,000 copies, making it one of the first hit titles in the burgeoning PC game market.

Encouraged by this success, the couple founded their own company, On-Line Systems, later renamed Sierra On-Line. They quickly established themselves as pioneers in the



adventure genre, blending rich storytelling, puzzles, and cutting-edge technology. Their next games, including *The Wizard and the Princess* and the *King's Quest* series, pushed the boundaries of what games could achieve, introducing vibrant color graphics, animation, and more complex interactivity.

Sierra On-Line's innovative approach reshaped the gaming landscape, transforming adventure games from niche curiosities into mainstream hits. Roberta's ability to craft engaging narratives and Ken's technical expertise proved a winning combination, making Sierra synonymous with creativity and quality throughout the 1980s and early 1990s.

Mystery House

In 1980, Roberta Williams created *Mystery House*, a groundbreaking adventure game that revolutionized the gaming landscape by combining graphical elements with interactive storytelling. The game tasked players with solving a murder mystery by exploring a haunted house filled with clues, hidden objects, and deadly traps.

Mystery House introduced innovative mechanics, including basic graphics to represent the game's rooms and characters—an unprecedented feature for the time. Players had to navigate the mansion, interact with various objects, and solve puzzles while uncovering the mystery behind the crime. This marked a major leap forward in adventure gaming, as previous games had relied solely on text-based commands. The game sold more than 10,000 copies and helping to establish a new genre of graphic adventure games. It is recognized as one of the first graphical adventure games and a key milestone in the development of interactive fiction. Its influence can still be seen in many modern adventure games, as it set the stage for more



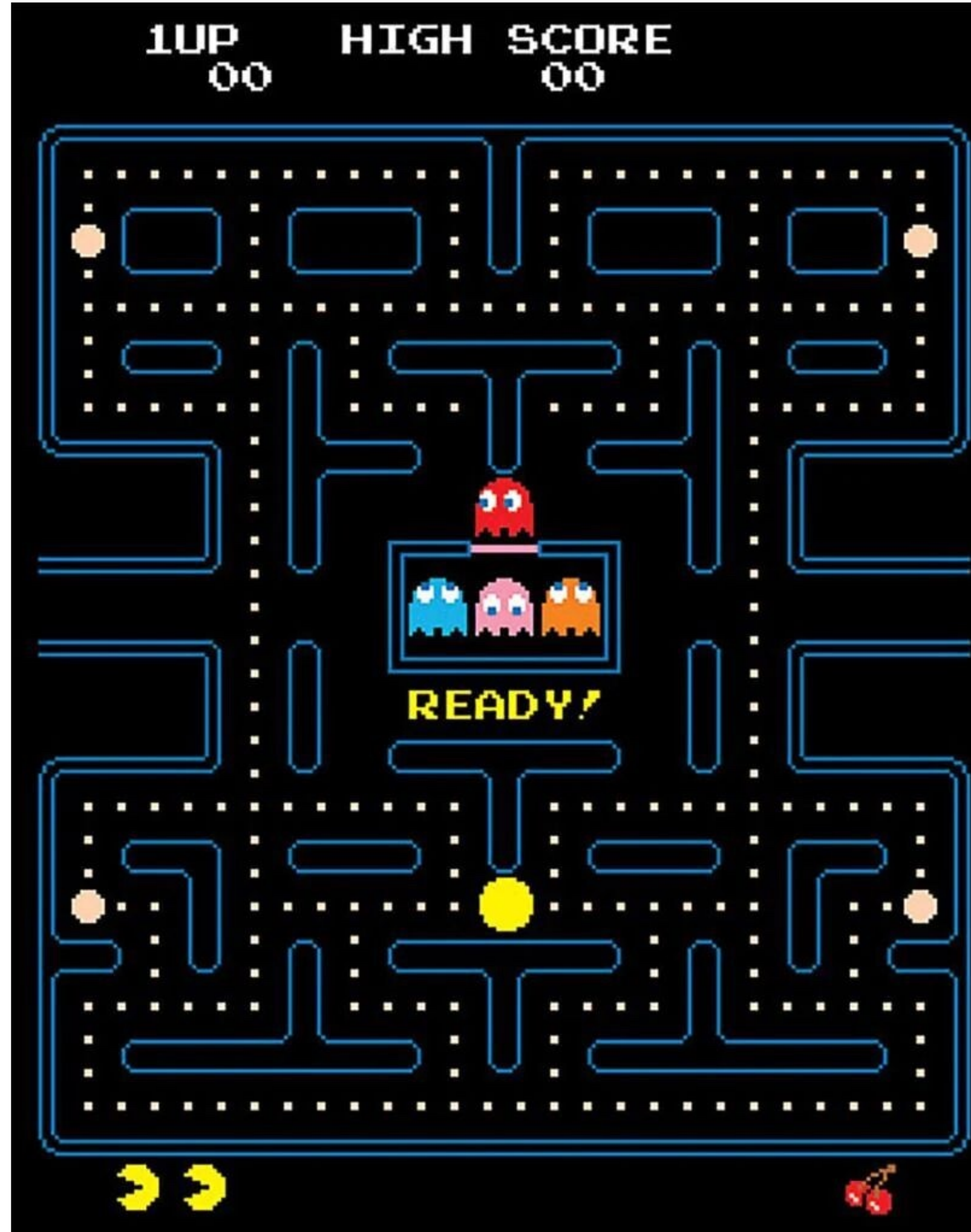
complex and immersive experiences. *Mystery House*'s legacy endures, with Roberta Williams' innovative design shaping the future of storytelling in games.

Game details:	
Year of Release	1980
Systems:	Apple II
Genre:	Graphic Adventure
Developer:	Roberta & Ken Williams
Publisher:	Sierra On-Line

Pac-Man

In 1980, Namco released *Pac-Man*, a groundbreaking arcade game that quickly became a cultural phenomenon and one of the most iconic video games in history.

According to legend, the game creator, Toru Iwatani was inspired to create *Pac-Man* by the sight of a pizza with a missing slice, which gave him the idea for a round character that would "eat" the maze. He wanted to create a game that appealed to women, who at the time were not frequent arcade-goers, so he deliberately designed *Pac-Man* to be non-violent, with a cute and friendly aesthetic. Unlike the typical space shooters or maze-chase games of the time, *Pac-Man* was a colorful, whimsical experience, driven by a simple yet addictive gameplay loop (image right: the arcade version of Pac-Man).



The game featured a unique concept centered around a yellow, circular character named Pac-Man, who navigated through a maze eating pellets while avoiding four colorful ghosts. The goal was simple: clear the maze of pellets, known as "dots," while avoiding capture by the ghosts, who relentlessly pursued Pac-Man. The ghosts' varied behaviors added depth to the gameplay, creating a constant sense of tension and strategy as players had to navigate the maze, collect power pellets, and avoid or outmaneuver the ghosts. Power pellets, when eaten, temporarily turned the ghosts blue, making them vulnerable and allowing Pac-Man to eat them for extra points.

The game’s immense popularity helped it become one of the best-selling arcade games of all time, leading to a massive cultural impact. *Pac-Man* transcended the gaming world, inspiring merchandise, an animated TV series, a hit song, and even a *Pac-Man* breakfast cereal. It became a symbol of the early 1980s arcade boom and is widely regarded as one of the most influential games in history.

Pac-Man's success also marked a turning point in video game design, showing that arcade games didn’t have to be violent to captivate players. The game’s quirky characters,

simple but engaging mechanics, and vibrant design made it a timeless classic, and its influence can still be seen in modern games that emphasize strategy, memorization, and unique character behavior. Today, *Pac-Man* remains one of the most recognized and beloved video games of all time, continuing to be celebrated for its innovation and cultural significance.



Game details:	
Year of Release	1980
Systems:	Arcade / Atari 2600
Genre:	Maze
Developer:	Toru Iwatani
Publisher:	Namco

Zork I

Released in 1980 by Infocom, *Zork I: The Great Underground Empire* is one of the pioneering interactive fiction (IF) games, marking the beginning of the *Zork* series. Developed by MIT students, it introduced players to a vast, text-based world filled with puzzles, treasure, and danger. The game's premise is simple: players assume the role of an adventurer exploring a complex underground

empire in search of a legendary treasure.

As a text-based game, *Zork I* relied solely on descriptive text to immerse players in its world. Players issue simple commands like "go north" or "take lamp" to interact with the environment, which responds with detailed

descriptions of locations, items, and characters. The game is set in a sprawling underground world featuring dungeons, caves, and labyrinths. Players must solve puzzles, avoid traps, and battle monsters while collecting items such as a lantern and sword to help them progress.

Its success established Infocom as a leading creator of interactive fiction, paving the way for more iconic games, including "The Hitchhiker's Guide to the Galaxy" and an entire series of *Zork* games!



Game details:	
Year of Release	1980
Systems:	PDP-10, Apple II, PC
Genre:	Text Adventure
Developer:	-
Publisher:	Infocom



ELECTRONIC ARTS™

Atari was a major force behind the development of original games for its consoles. However, game developers were never given any credit for their creations, even though they requested it. Management at Atari, especially after the acquisition of the company by Warner, treated the developers as expendable, causing great dissatisfaction. At one point, one of the developers decided to include his name in the credits of the game, hidden away as the first "easter egg" (see "Adventure").

In 1982, after growing disillusioned with the management and direction of Atari, a group of Atari employees, led by Trip Hawkins, left the company and founded their own video game company, one that focused on both creative freedom for developers and establishing a brand identity for game creators. One of the key steps in EA's formation involved reverse engineering Atari's cartridge games. When Hawkins and his co-founders left Atari, they recognized that the home console market was growing rapidly and that there was a huge demand for third-party

games that weren't controlled by companies like Atari. Reverse-engineering the Atari cartridges allowed them to understand the game code and figure out how to produce their own games that would run on Atari consoles, which was an essential part of their plan to break into the industry. This "hacking" of the console allowed them to bypass Atari's proprietary limitations and establish a market for third-party game development, which would ultimately disrupt the industry's business model.

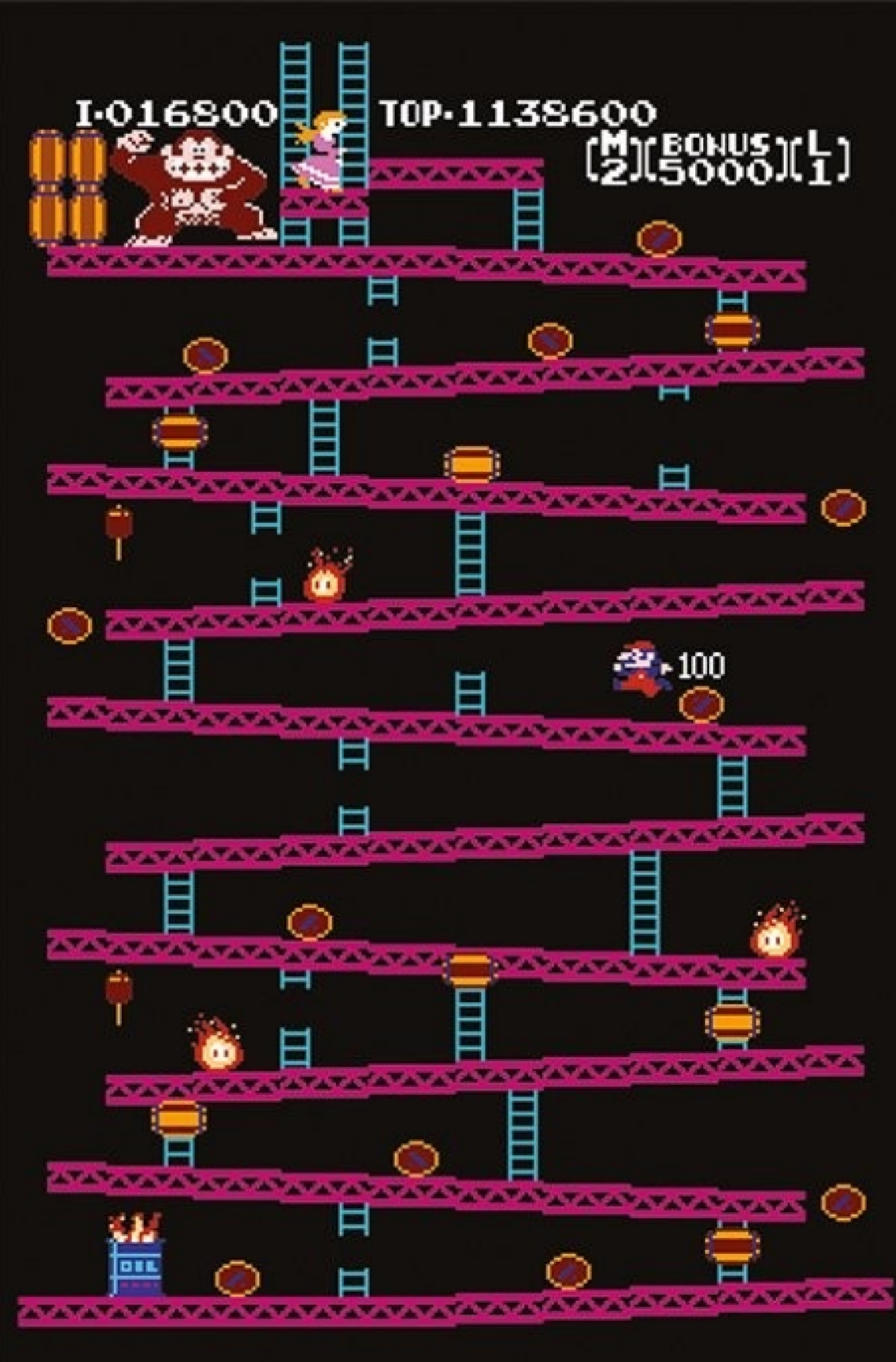
The founders of EA made a radical decision to promote the developers behind the games, giving them a public identity and credit for their creations, something that was rare at the time. Before EA, game developers were often anonymous, and their work was not associated with their personal identities. EA's early approach to branding the creators as "artists" or "visionaries" was a novel concept that gave developers recognition and a stake in the success of their projects.

Donkey Kong

Released in 1981 by Nintendo, *Donkey Kong* became one of the most influential arcade games in history, introducing players to a new kind of platformer while launching the career of one of video games' most iconic characters: Mario.

The game was designed by Shigeru Miyamoto, who was tasked with creating a new arcade game. Initially, Nintendo had intended to make a *Popeye* arcade game, but due to licensing issues, Miyamoto and his team developed an entirely original concept. The result was *Donkey Kong*, which featured a story-driven gameplay experience that was innovative for its time. In the game, Mario (initially called "Jumpman") must rescue his girlfriend, Pauline, from the clutches of the giant ape Donkey Kong.

The gameplay of *Donkey Kong* is straightforward but challenging. Players control Mario as he climbs ladders, jumps over barrels, and avoids obstacles to reach the top of the screen where Donkey Kong holds Pauline.



The game is divided into four stages: a construction site, a conveyor belt, a platforming stage, and the final rescue stage, each filled with increasingly difficult obstacles. The action takes place in a vertically scrolling screen, where Mario must jump over obstacles such as barrels and fire, dodge enemies, and navigate platforms to advance.

Graphically, *Donkey Kong* was revolutionary for its time. The game featured colorful, large sprites and had a more defined visual narrative compared to other arcade games, which often used simple shapes and static backgrounds. The characters, especially Mario and Donkey Kong, were created using pixel art that was as expressive as the technology would allow, giving the game a more animated, lively feel. Mario’s distinctive look, with a mustache, cap, and overalls, was influenced by the hardware limitations of the time, allowing him to be easily recognizable in the limited resolution available.

In terms of gameplay, *Donkey Kong* defined the platformer genre by introducing a combination of climbing, jumping, and avoiding hazards in a multi-level environment, all of which became core elements of platforming games. Prior to *Donkey Kong*, arcade games were often based on maze or shooting mechanics, but *Donkey Kong* showcased that

players could engage in a more dynamic form of interaction. The game required precision and timing, pushing players to learn the layout of each stage and find ways to dodge Donkey Kong’s attacks while navigating platforms.

The success of *Donkey Kong* had far-reaching effects on both Nintendo and the gaming industry as a whole. Not only did it mark the debut of Mario—who would go on to become Nintendo's mascot in countless games—but it also established the foundation for the platforming genre, which would be further refined and expanded in future titles like *Super Mario Bros*. It also introduced a narrative for the game, another industry-first, that would define platformers and action games for decades to come.

Game details:	
Year of Release	1981
Systems:	Arcade, NES
Genre:	Platformer
Developer:	Shigeru Miyamoto
Publisher:	Nintendo

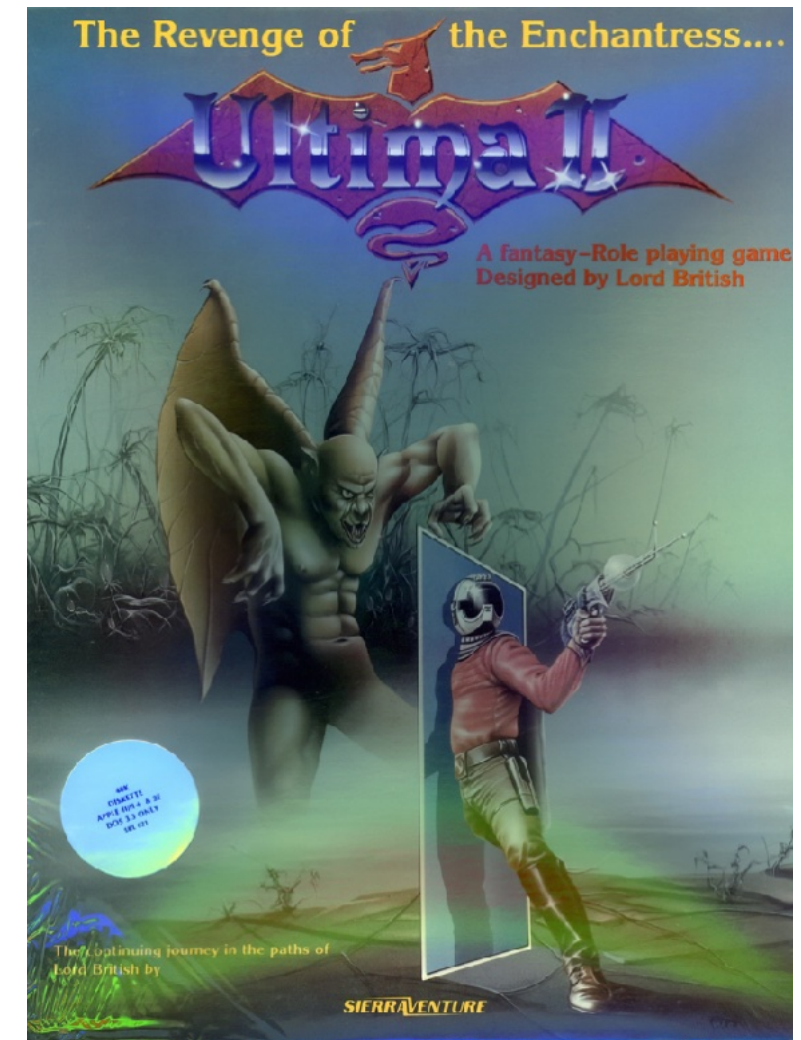
Ultima II

Ultima II: The Revenge of the Enchantress was released in 1982 as the second installment in Richard Garriott's groundbreaking Ultima series, one of the most influential and long-running franchises in the history of role-playing games (RPGs). Developed by Garriott and his company, Origin Systems, Ultima II marked a significant evolution from its predecessor, Ultima I: The First Age of Darkness, introducing new gameplay features and a more expansive world that would set the standard for RPGs for years to come.

Richard Garriott, who is also known by his gaming alias "Lord British," created the *Ultima* series as part of a larger effort to establish an immersive and interactive experience in the nascent genre of computer role-playing games. *Ultima I* was an early attempt at combining dungeon crawling with world exploration, but *Ultima II* expanded the scope significantly. It introduced a much larger world, both in terms of geographic scale and the scope of its narrative. The game was set across multiple time periods, blending

science fiction with fantasy in a way that hadn't been done before in RPGs. This mix of genres was one of the aspects that made *Ultima II* groundbreaking. In *Ultima II*, players find

themselves caught in a battle against the evil Enchantress Minax, who has altered the fabric of time and space. The game featured a world where players could travel between different historical eras, such as the medieval past, a futuristic future, and even locations like outer space. Players could explore towns, dungeons, and even engage in battles through an early form of turn-based combat. The variety of environments, as well as the ability to travel through time, set the game apart from many of its



contemporaries and helped establish *Ultima* as a pioneer in the RPG genre.

The game also introduced an innovative, open-world format where players were free to explore and complete quests in a non-linear fashion. Unlike many other RPGs of the time, which relied on a more rigid progression of levels or story beats, *Ultima II* encouraged players to make their own decisions, which added a layer of depth and replayability.

Ultima II was heavily inspired by *Dungeons & Dragons* (D&D), the pen-and-paper role-playing game that had a profound impact on Garriott and many other early RPG designers. The game's dungeon crawling, random encounters, and emphasis on character progression also mirrored D&D mechanics, which were still a novel and revolutionary concept in computer gaming at the time.

In terms of graphics and design, *Ultima II* featured improved visuals compared to its predecessor. The game

used a top-down perspective, allowing players to explore towns and dungeons from an overhead view, which was a step forward in creating a more immersive and interactive world. The game also included a form of world map, making navigation easier and encouraging exploration.

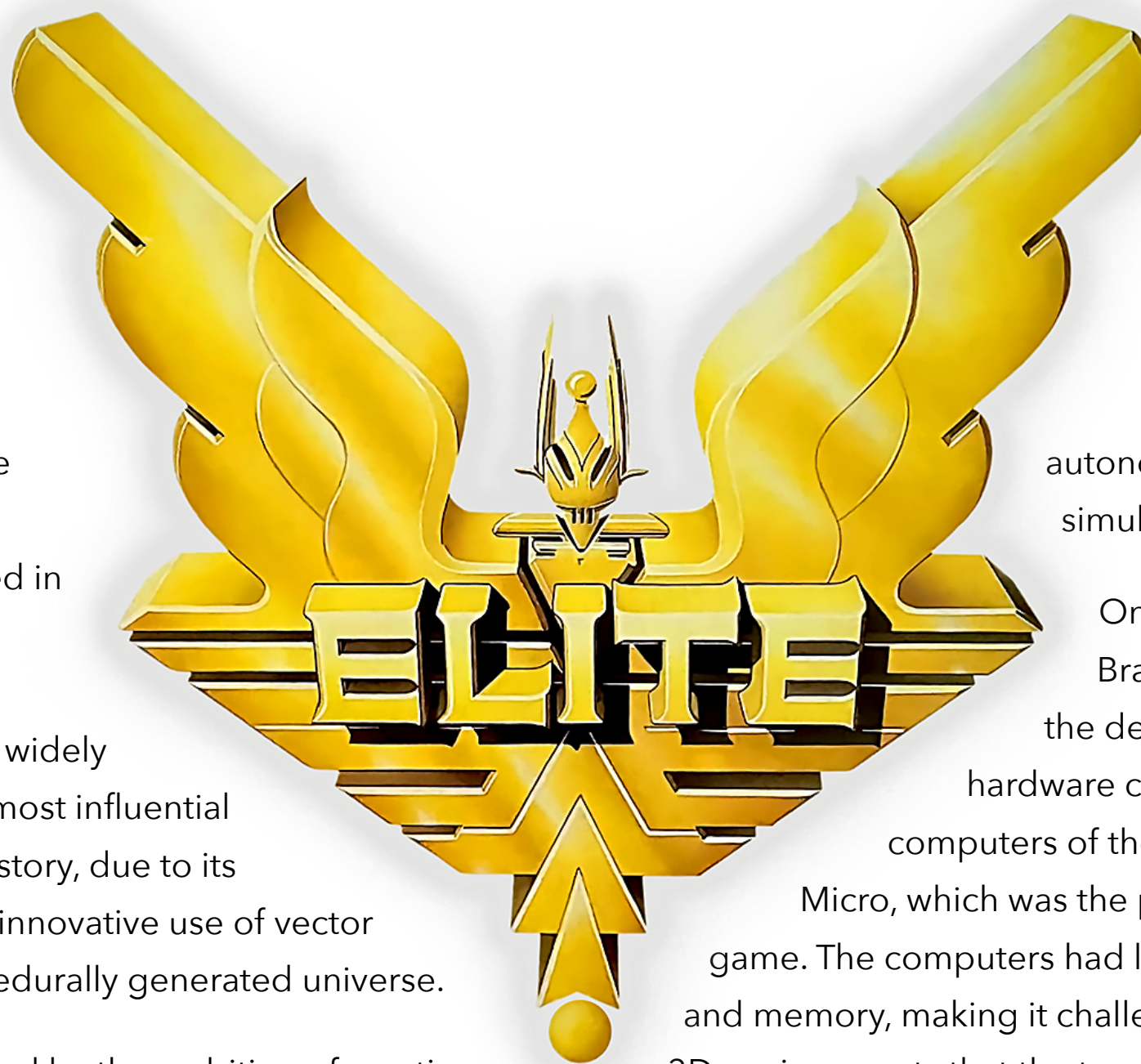
Its success solidified the *Ultima* series as a foundational pillar of RPGs and set the stage for *Ultima III: Exodus*, which would introduce even more innovative features, including party-based gameplay.



Game details:	
Year of Release	1982
Systems:	Apple II, PC
Genre:	Role Playing Game
Developer:	Richard Garriott
Publisher:	Origin Systems

Elite is a landmark space trading and combat simulation game released in 1984, created by British game designers David Braben and Ian Bell. It is widely regarded as one of the most influential games in video game history, due to its open-ended gameplay, innovative use of vector graphics, and vast, procedurally generated universe.

David Braben was inspired by the ambition of creating a space exploration game that would provide players with a sense of freedom and vastness. The game drew from various sources, including classic space-themed science fiction, such as *Star Wars* and the earlier space simulation *Star Raiders*. Braben's goal was to create a game where players could explore, trade, and engage in combat within an expansive universe, all while offering a sense of



autonomy and immersion in a simulated space environment.

One of the key limitations that Braben and Bell faced during the development of *Elite* was the hardware constraints of the home computers of the time, particularly the BBC Micro, which was the primary platform for the game. The computers had limited processing power and memory, making it challenging to create the detailed 3D environments that the team envisioned. In response, they opted for vector graphics, which allowed for simple, wireframe-style representations of ships, stations, and planets. The decision to use vector graphics was a crucial one, as it not only enabled *Elite* to run smoothly on the available hardware but also gave the game a distinctive visual style that became iconic in its own right.

The game’s design was groundbreaking in its open-ended nature. Rather than a linear progression of missions or a single storyline, *Elite* allowed players to choose how they wanted to engage with the game world. Players could trade goods between planets, engage in bounty hunting, or become mercenaries, all while earning credits to upgrade their ship. This open-ended approach, combined with a procedurally generated galaxy featuring over 8,000 planets, provided an immense sense of freedom and replayability. The game’s nonlinear structure and emphasis on exploration and personal choice set a new precedent for future open-world and sandbox-style games.

Elite’s influence extended far beyond its initial release. It is widely considered a precursor to the open-world genre, laying the foundation for subsequent titles like *Privateer*, *EVE Online*, and the *X* series. The game’s use of procedural generation also influenced later games that aimed to create vast, ever-expanding game worlds without the need for pre-built content.



The success of *Elite* spawned several follow-up games, including *Elite: Dangerous*, released in 2014. The sequel retained the core elements of the original, with a vast open universe for players to explore, trade, and fight in. It also incorporated modern advancements in graphics and multiplayer functionality, allowing *Elite*’s legacy to continue in a more contemporary context.

Ultimately, *Elite* was revolutionary for its time, pushing the boundaries of what was possible in video games. It introduced concepts of freedom, exploration, and procedural generation that have since become central to many of the open-ended games we enjoy today.

Game details:	
Year of Release	1982
Systems:	BBC Micro, Acorn Electron
Genre:	Space Simulation
Developer:	David Braben, Ian Bell
Publisher:	Acornsoft

E.T. (c)rushed Home

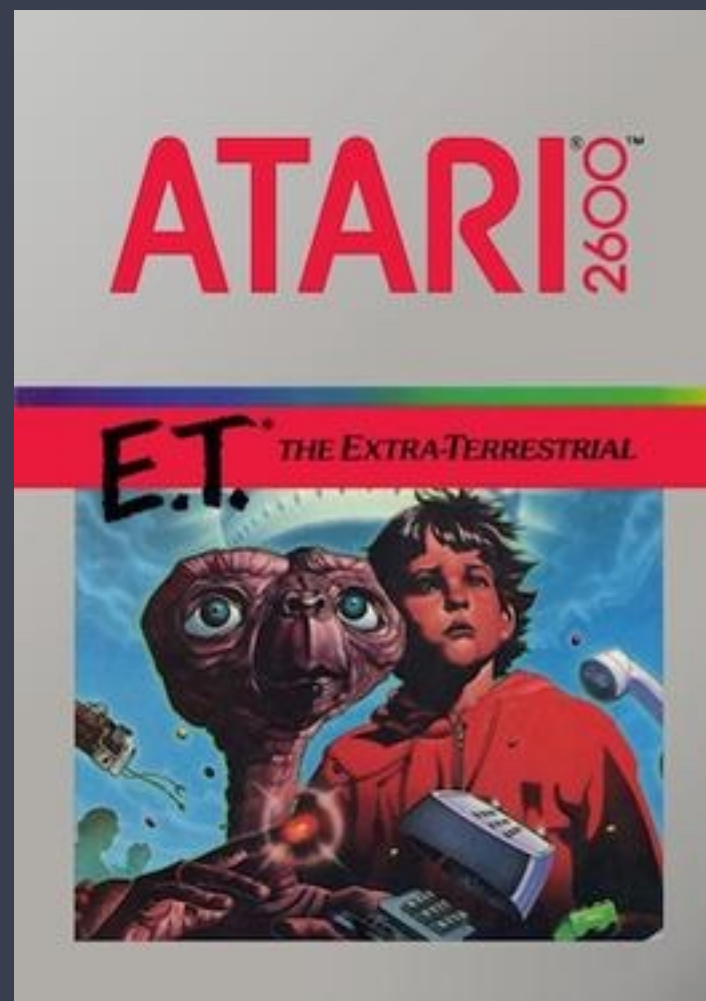
In 1982, Howard Scott Warshaw, a developer at Atari, found himself facing an unprecedented challenge. The company had secured the rights to create a video game based on the wildly successful film *E.T. the Extra-Terrestrial*, and they were determined to release it in time for the holiday season. The problem? Warshaw was given just five weeks to develop the entire game – an almost impossible timeline.

Atari was under intense pressure to capitalize on the movie's success, and with the clock ticking, they needed a game that would appeal to both *E.T.* fans and Atari's existing player base. Warshaw was flown to meet Steven Spielberg, who was the director of *E.T.*. Spielberg shared the general premise of the film but didn't provide many specific instructions for the game. He left

Warshaw with a great deal of creative freedom, but this only added to the pressure. Warshaw knew the game had to be more than just a cash grab; it had to live up to the expectations of both the film's fans and the industry's eager anticipation.

Despite the challenges, Warshaw set to work creating the game. He designed a maze-like world where players would control E.T., helping him find pieces of his broken phone while avoiding government agents. But there was a fundamental issue: the gameplay mechanics didn't translate well to the limited capabilities of the Atari VCS system, and the design felt awkward. The five-week deadline left Warshaw with little time for revisions or testing, and the result was a confusing, difficult game that

left many players frustrated.



To make matters worse, Atari made the decision to produce millions of cartridges, far more than there were Atari VCS systems in circulation. The company had high hopes that the game would be a massive hit, but once it was released, the reality was starkly different. *E.T.* quickly became one of the most poorly received video games of its time. The game's confusing design and frustrating gameplay led to a commercial disaster. Unsold cartridges piled up, and Atari was left with a massive inventory of unwanted *E.T.* games.

The failure of *E.T.* had a lasting impact on Atari and the video game industry as a whole. The game's lack of success contributed to the 1983 video game crash, a period during which the industry faced significant losses. In a now-infamous move, Atari buried millions of unsold *E.T.* cartridges in a New Mexico landfill. For Warshaw, the game became a symbol of rushed development, unrealistic expectations, and a cautionary tale of overproduction.



Despite the negative outcome, Warshaw later reflected on the experience, acknowledging that the pressures of time and expectations were overwhelming. In interviews, he explained that the rushed nature of the project, coupled with the limited technology of the time, led to the game's ultimate failure. Despite the failure of the game, it has been

forever linked with the history of Atari and the video games industry!

The end of a myth:

In 2014, Microsoft's *Xbox* team confirmed the long-rumored story that millions of unsold *E.T. the Extra-Terrestrial* cartridges were buried in a New Mexico landfill (image, centre). After the game's failure in 1982, Atari buried the surplus

cartridges to recover financially. The excavation uncovered *E.T.* and other unsold games, cementing the tale as a symbol of the 1983 video game crash. The recovered cartridges were later sold as collector's items, solidifying *E.T.*'s infamous place in gaming history.

E.T. the Extra-Terrestrial

E.T. the Extra-Terrestrial for the Atari VCS, released in 1982, is often remembered as one of the most infamous video games in history, largely due to its graphics, sound, gameplay, and the difficulties players encountered. The game was rushed into development, giving only five weeks to create it, which led to a final product that was both confusing and frustrating.

The game's graphics were one of its most notable weaknesses.

Atari's VCS system was limited in terms of graphical capabilities, and *E.T.* was no exception. The character of E.T. was represented as a small, pixelated figure that looked very little like the character from the film. The game's environments were also hard to distinguish, with overlapping maze-like structures that often made it difficult

for players to identify where they were and what they needed to do. The game used an isometric view, but the graphics were overly simplistic, resulting in a confusing and disorienting visual experience.



The sound design of *E.T.* was minimalistic, owing to the limitations of the Atari VCS's hardware. There was no music to accompany the gameplay, but the game did feature basic sound effects that were intended to represent actions

like footsteps, E.T. calling for his spaceship, or the sound of government agents. These sounds were not particularly memorable or immersive, often contributing to the game's overall lackluster feel.

The story was based on the film *E.T. the Extra-Terrestrial*, where players control E.T., the lovable alien who must collect pieces of his broken communication device to call home. As the game progresses, players must navigate various screens in search of these pieces, while avoiding government agents. The challenge came in the form of the game's objective, which was unclear and difficult to follow. Unlike the film, which had a clear narrative, the game lacked coherent storytelling, leaving players unsure of what to do next.

The controls in *E.T.* were clunky and unintuitive. Players moved E.T. through various maze-like levels, but the character's movements often felt sluggish, and the game's collision detection made it hard to navigate around obstacles. One of the game's most frustrating features was the way E.T. would fall into pits, requiring the player to repeatedly climb out, wasting precious time and causing the game to feel more like a trial of patience rather than an enjoyable experience.



The gameplay itself was challenging, not because of its difficulty level, but due to its confusing mechanics and unclear objectives. The player's task – to find the pieces of E.T.'s communicator – was hampered by the game's disorienting layout. The levels were easy to get lost in, and the pieces were hidden in random locations, which made the search frustrating. Additionally, the government agents would often interfere, making it harder to collect the necessary items. The lack of a clear goal or progression left many players feeling lost. Unsurprisingly, the game was a tremendous failure for Atari.

Game details:	
Year of Release	1982
Systems:	Atari 2600
Genre:	Action Adventure
Developer:	Howard Scott Warshaw
Publisher:	Atari

Lucasfilm Games

Lucasfilm Games, later renamed LucasArts, was founded in 1982 by George Lucas, the creator of *Star Wars*, as part of his broader Lucasfilm empire. The division was established to explore the burgeoning video game industry and create interactive entertainment that aligned with Lucas's passion for storytelling and technology.

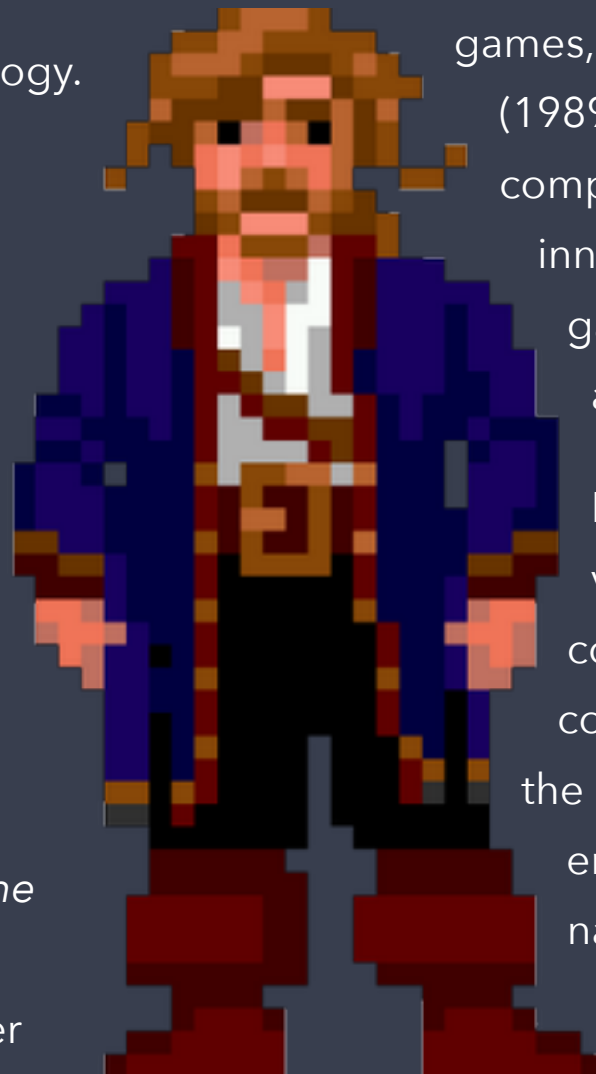
Key figures like Steven Arnold, David Fox, Noah Falstein, and Ron Gilbert were instrumental in its formation and early development.

Initially focused on creating video games based on Lucasfilm's existing film properties, the company soon branched out to original games. Its first releases included *Ballblazer* (1985) and *Rescue on Fractalus!* (1985), showcasing innovative gameplay. However, it was the release of *The Secret of Monkey Island* (1990) that truly defined Lucasfilm Games. Developed under Ron Gilbert's direction, the game's mix of

humor, puzzle-solving, and narrative set a new standard for the adventure game genre, and the SCUMM engine it used became a staple for many of their subsequent titles.

The success of *Monkey Island* led to other iconic adventure games, including *Indiana Jones and the Last Crusade* (1989) and *Grim Fandango* (1998). In 1990, the company rebranded as LucasArts and continued to innovate, pushing the boundaries of narrative-driven gameplay with titles like *Day of the Tentacle* (1993) and *Sam & Max Hit the Road* (1993).

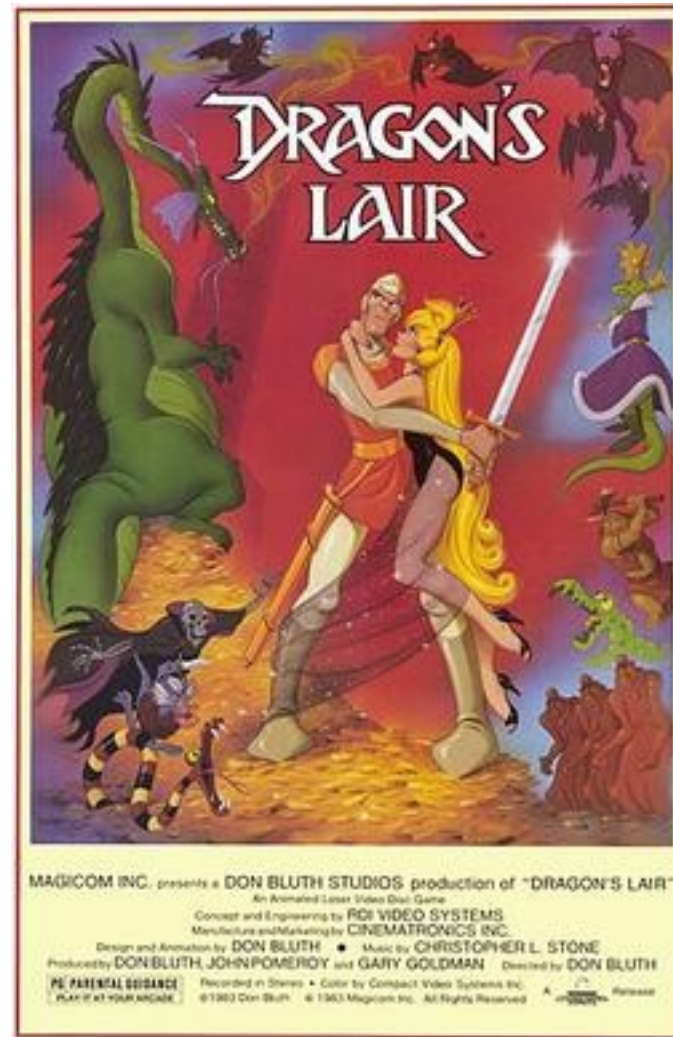
Lucasfilm Games played a vital role in shaping the video game industry, demonstrating that games could be powerful storytelling mediums. The company's legacy remains influential, particularly in the development of adventure games and their emphasis on humor, creativity, and engaging narratives.



Dragon's Lair

Dragon's Lair (1983) was a groundbreaking laserdisc video game created by Rick Dyer and developed by Don Bluth, a former Disney animator. It was designed to provide an interactive experience that would feel like playing through a cartoon, appealing to players who were drawn to the combination of animation, fantasy, and arcade gameplay. Its primary target audience was those looking for a new kind of visual experience in gaming, with a particular focus on younger players and arcade enthusiasts fascinated by high-quality animation.

One of the most significant technical breakthroughs of *Dragon's Lair* was its use of laserdisc technology, which allowed for full-motion video rather than the pixelated, static graphics typical of video games at the time. The



game used a laserdisc player to play pre-rendered animation sequences, a technology that had not been used in video games before. This allowed *Dragon's Lair* to present stunning animation that looked like a cartoon, featuring high-quality visuals created by Don Bluth and his team. The game's story, which centers on the heroic knight Dirk the Daring rescuing Princess Daphne from the evil dragon Singe, was presented through beautifully drawn and animated cutscenes.

While the visuals were revolutionary, *Dragon's Lair* was criticized for its gameplay. The game required precise timing and quick reflexes to make split-second decisions, as

players had to choose the correct action at the right time. However, the gameplay was often considered more of a quick-time event experience than a fully interactive video game. Players could lose quickly with one wrong move,

leading to frustration. Additionally, because the gameplay was essentially a series of predetermined animations, players had little freedom or control over the outcome, which made the game feel rigid and repetitive. Some considered this style of play less engaging than traditional arcade games with more skill-based mechanics.

The laserdisc technology also had its limitations. The storage capacity of the laserdisc was far from unlimited, which meant that *Dragon's Lair* could not offer the same depth or complexity as games that relied on traditional sprite-based graphics. The need for fast, precise input also made the game difficult, especially for those unfamiliar with its mechanics. This, combined with the fact that the game was essentially a timed sequence of animations, made it frustratingly difficult for some players to progress without failing repeatedly.

Despite its criticism, *Dragon's Lair* became a commercial success due to its novelty and the appeal of its visual style. It pushed the boundaries of what video games could look

like, even if its gameplay didn't match the innovative visuals. Later, the game was re-released in digital form, including versions for modern platforms, smartphones, and even interactive movies.

While *Dragon's Lair* may have been criticized for its lack of true gameplay depth, it remains an iconic example of the early days of interactive multimedia entertainment. The unique cartoon visuals and its storytelling, inspired many games that came afterwards, especially during the height of the multimedia era.



Game details:	
Year of Release	1983
Systems:	LaserDisc Arcade
Genre:	Interactive Animation
Developer:	Don Bluth
Publisher:	Cinematronics

Lode Runner

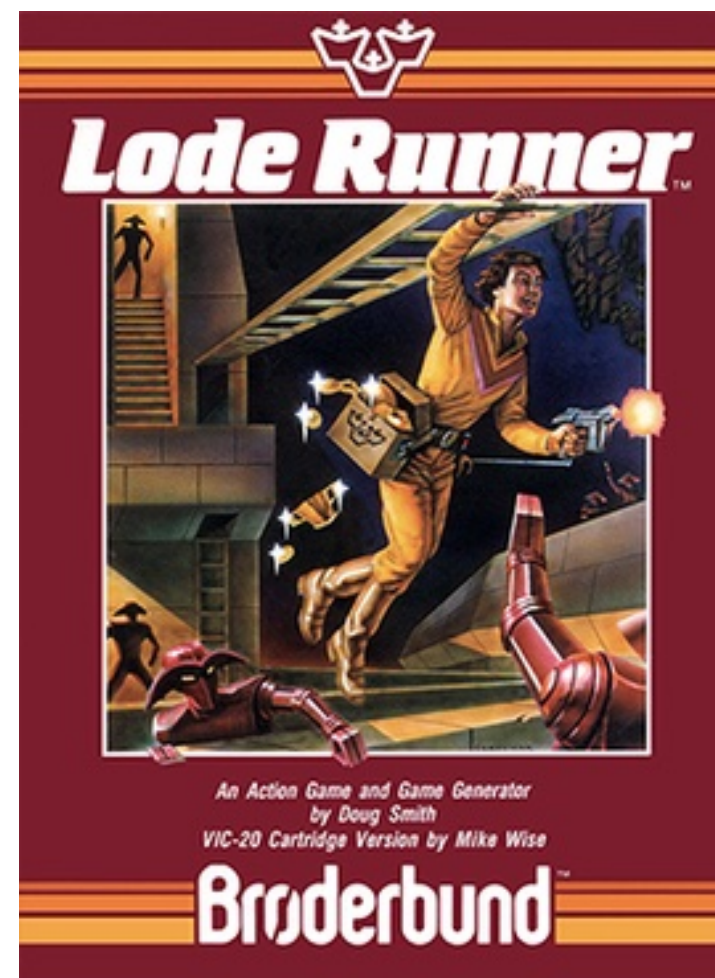
Lode Runner is an influential puzzle-platform game that captivated players with its mix of strategy, action, and maze-solving elements. Created by Doug Smith and released in 1983 by Broderbund, the game quickly became a classic due to its unique gameplay mechanics and level design (image top right: Apple II version of the game).

The core objective of *Lode Runner* is simple: players control the "Runner," who must collect all the gold pieces scattered throughout a maze-like level while avoiding enemies. Each level is a grid-based layout, with platforms, ladders, and holes. The Runner can move left and right, climb ladders, and dig holes into the platforms to trap enemies temporarily.



The key challenge is to collect all the gold while managing enemies that patrol the level. If the Runner is caught by an enemy, they lose a life and must restart from the beginning of the level.

The dig-and-trap mechanic is central to *Lode Runner*'s strategy. When the Runner digs, they create a hole that temporarily traps enemies. The holes disappear after a few moments, allowing enemies to escape, so players must plan their movements carefully to avoid getting trapped themselves. The Runner can only dig a certain number of holes at a time, meaning players must use this ability strategically.



The game features multiple levels, each progressively more difficult with more complex mazes, additional enemies, and tighter time constraints. What makes the game unique is its combination of both action and puzzle-solving elements. The player has to not only avoid or trap enemies but also figure out the best routes to collect all the gold, while balancing the need to dig holes without running out of time.

A standout feature of *Lode Runner* was its level editor, which allowed players to create their own custom levels and share them. This ability to design and play user-generated content added a layer of replayability and ensured that the game remained fresh and engaging over time.

The game's success led to several sequels and adaptations, cementing *Lode Runner* as one of the most influential puzzle-platform games in video game history. Its combination of strategic thinking, action, and user-created content influenced many games that followed and remains an iconic title in the genre.

The game's influence is still felt today, as it introduced key concepts that were later used in other games, such as user-



generated content and dynamic level design. Its success led to numerous sequels and adaptations, solidifying *Lode Runner* as one of the foundational titles in video game history.

Game details:	
Year of Release	1983
Systems:	Apple II, C64, NES
Genre:	Puzzle - Platformer
Developer:	Douglas E. Smith
Publisher:	Broderbund

Knight Lore

Knight Lore is a seminal action-adventure game developed by *Ultimate Play the Game* (later known as *Rare*) and released in 1984 for the ZX Spectrum, one of the most popular home computers of the time.

The game is widely recognized as one of the earliest examples of isometric 3D graphics in a video game, a feature that set it apart from other games of its era and significantly influenced the development of future titles in the genre. The player controls a character named Sabreman, a knight cursed to transform into a werewolf every night. The game takes place within a sprawling, multi-level castle filled with puzzles and enemies, and the goal is to find a cure for Sabreman's curse before the transformation occurs. *Knight Lore* was groundbreaking in its genre, blending elements of action, exploration, and

puzzle-solving, with players needing to navigate the castle, avoid or defeat enemies, and solve environmental puzzles.



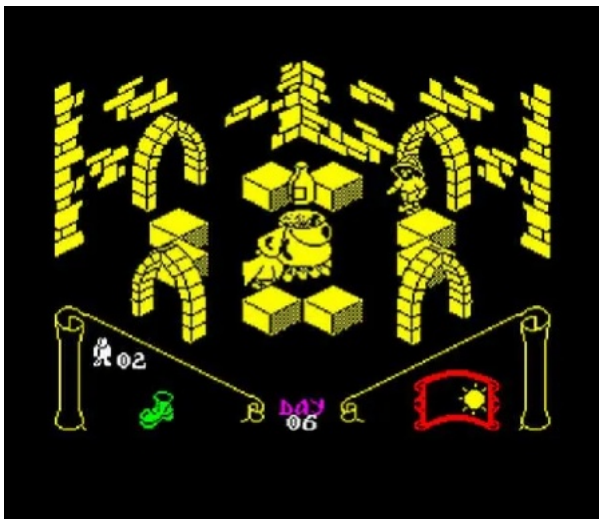
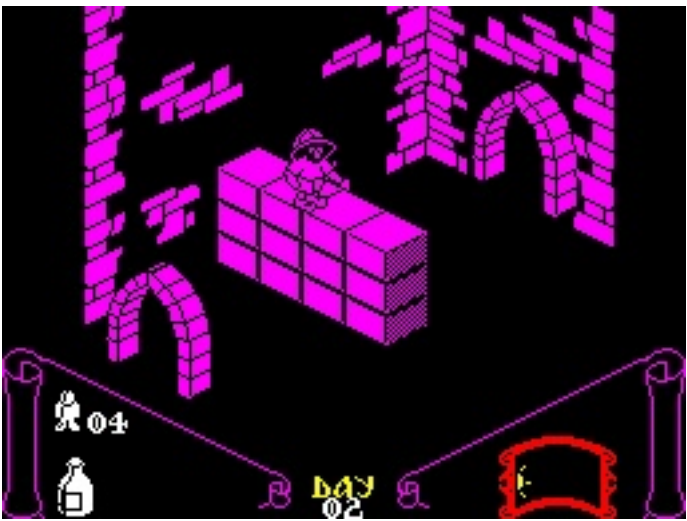
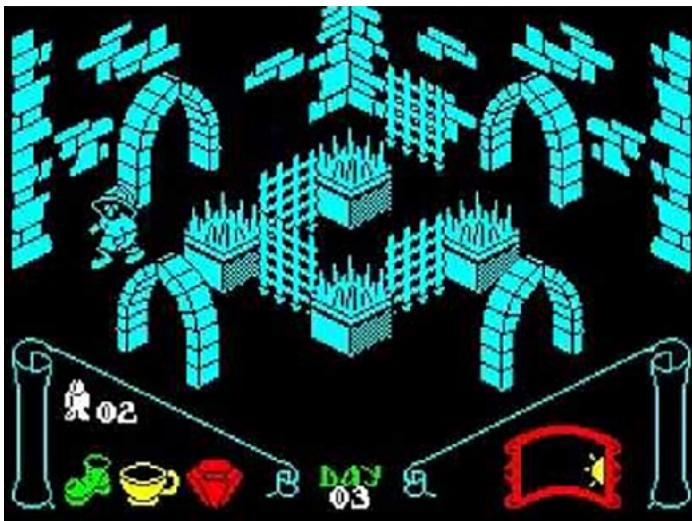
The game also incorporated a time-based mechanic, where the player's progress is hindered by the ticking clock, adding urgency and tension to the gameplay.

Technically, the development of *Knight Lore* was a significant challenge due to the limitations of the ZX Spectrum. The most notable technical achievement was the implementation of isometric projection, which allowed the game to display 3D-like environments on a 2D screen, a highly advanced feature at the time. The team at Ultimate Play the Game, led by Tim Stamper, had to overcome considerable difficulties in

rendering the isometric graphics and ensuring that the game could run smoothly on the ZX Spectrum's hardware, which had limited processing power and memory.

What made *Knight Lore* unique was its use of isometric graphics, which provided a novel perspective that was rare in the early 1980s. The game's visual style allowed players to explore the castle in a way that felt more immersive compared to traditional 2D platformers. Additionally, the game introduced a day-night cycle, where the character's transformation into a werewolf added a dynamic element of challenge. The shifting perspective and the need to adapt to different situations in the game's world created an engaging and varied experience.

The sound in *Knight Lore* played an essential role in contributing to the game's atmosphere. The ZX Spectrum's sound capabilities were limited, but the game made the most of it, using sound effects to enhance the sense of tension, such as the sound of footsteps or the growl of enemies. The lack of a full musical score was offset by effective use of ambient sounds, which helped create a foreboding and eerie environment, complementing the game's dark and mysterious tone.



Knight Lore's legacy is profound. It is credited with advancing the action-adventure genre and influencing many games that followed. The isometric graphics were an inspiration for subsequent games like *Batman* (1986), *Head over Heels* (1987), *The Last Ninja* (1987) and more. Its pioneering use of isometric perspective also paved the way for future 3D games, making it a key milestone in the evolution of video games design.

Game details:	
Year of Release	1983
Systems:	ZX Spectrum, BBC Micro
Genre:	Isometric Adventure
Developer:	Chris and Tim Stamper
Publisher:	Ultimate Play the Game

The Video Game Crash

The video game crash of 1983, one of the most significant events in gaming history, was the result of a perfect storm of factors that overwhelmed the market and led to a drastic downturn in the industry. It marked the collapse of the early video game boom, caused by overproduction, poor-quality games, and a saturated market.

Market Saturation: One of the primary reasons for the crash was the oversaturation of the market with video game consoles and titles. In the early 1980s, the video game industry had experienced a boom, with many companies entering the market. This led to a flood of consoles, game cartridges, and arcade games. Manufacturers like Atari, Intellivision, and ColecoVision produced an overwhelming number of systems, which left consumers with too many choices and not enough differentiation between the products. Additionally, video game developers flooded the market with titles, many of which were of poor quality, resulting in a decline in consumer confidence.

Commodore's Price Wars and Cheaper Computers: The role of Commodore was crucial in the crash, particularly through its aggressive price wars. Commodore introduced the C64, a highly affordable home computer, in 1982, which quickly became a popular choice for gaming. As prices of personal computers like the C64 dropped, more and more consumers turned to computers rather than dedicated gaming consoles for entertainment. These personal computers offered a wider variety of uses, including games, word processing, and productivity, further drawing attention away from dedicated game systems.

Poor quality of video games: The crash was also exacerbated by the involvement of non-video game companies, including General Mills (which owned Cinnamon Toast Crunch) and other cereal brands that began to produce their own video games. These companies had no experience in game development and released a series of low-quality, licensed games. These

efforts further diluted the market, as consumers were presented with an even larger quantity of poor-quality games, many of which were based on popular TV shows or products with little regard for gameplay quality.

E.T., the scapegoat: One of the most notorious examples of the industry's poor quality was the release of *E.T. the Extra-Terrestrial* for the Atari 2600. The game, rushed to meet the holiday season, was widely regarded as one of the worst video games ever made. The *E.T.* game's failure, along with other subpar titles, contributed to the erosion of trust between consumers and video game companies.

Unsatisfied customers were hesitant to purchase new games, leading to unsold inventory piling up. Atari, in particular, suffered greatly from this, eventually being forced to bury millions of unsold *E.T.* cartridges in a landfill.

The effect on the industry: For companies like Sierra-Online, which had invested heavily in development for consoles like the Atari 2600, the crash was devastating. Sierra-Online, known for its innovative text-based adventure games and graphic adventures, had heavily relied on the Atari VCS and the broader console market to distribute their titles. When the crash occurred, it forced companies like Sierra to rethink their strategies. Sierra

shifted focus to the emerging personal computer market, particularly the Apple II and Commodore 64, where there was a growing demand for more sophisticated games.

The crash led to the bankruptcy or exit of many companies. Atari, once the leader in the industry, suffered massive financial losses and eventually sold off its console division. ColecoVision and Intellivision were also severely impacted, leading them to either shut down or pivot to other markets. Smaller companies, like Activision, faced financial strain but ultimately survived by shifting to home computers and consoles that emerged after the crash.

As a result of these factors, many companies exited the market, leaving a major void. The market would not recover until the late 1980s when Nintendo revitalized the industry with the release of the Nintendo Entertainment System (NES), which was bundled with high-quality games, restoring consumer confidence and setting the stage for the video game renaissance of the 1990s.

The crash also reshaped the industry, leading to a greater focus on quality control, game development standards, and a more sustainable business model for gaming companies.

In this chapter...

In **Chapter 6** we were introduced to the booming video game industry, initially for personal computers, and then -due to the stubbornness of Atari management- for video game consoles. Out of Atari came Electronic Arts, while others started literally from their own kitchen, creating games for personal computers and selling them via mail order, sealed in plastic bags.

Soon, the industry would grow, with lone coders forming their own companies -or joining one. However, oversaturation and extremely low quality of games soon brought the booming industry down to its knees, taking with it many companies. Very few survived the crash, and even those had to literally live on scraps for a while, until the emergence of Nintendo. But that is a story for another chapter...

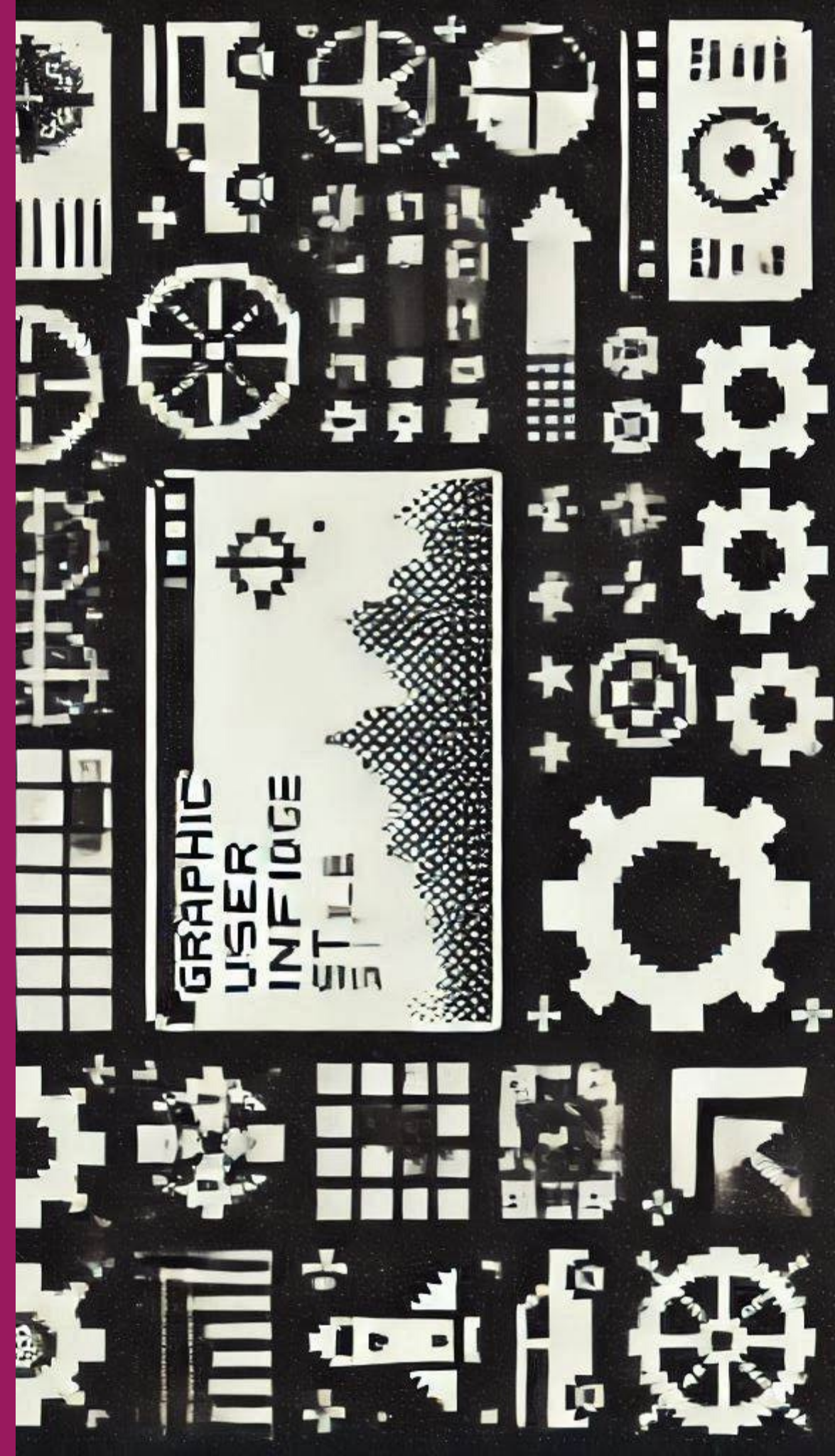


Part C: Rebirth

Rebirth & Reinvention

The unprecedented and largely unpredictable -until in the late 1970s- growth of the personal computer market, and the digital entertainment market (which would soon be inseparable), came soon to a stop, as a result of the video games crash in 1983, in the US. Even though the European and Japanese markets did not suffer the same fate -at least not to the same effect- the fact that consumer demand globally almost faded away, along with the destruction of many companies, gave the industry a serious heart attack.

Slowly the video games market will reemerge with new players taking over, with computers becoming more compatible using the IBM standards, and with a drastic turn to friendlier computers, using graphical interfaces. The 1980s was a decade of reinvention for the industry, and in many respects the golden age of personal "home" computers and video games.



• 7 •

Year of the Mouse

"To create a new standard, it takes something
not just a little bit different,
but something entirely new,
that really captures people's imagination.

Of all the machines I've seen, the Macintosh is
the only one that meets that standard!"

(William Henry Gates III)

Introduction

The video game crash of 1983 led to the bankruptcy of numerous companies, derailing plans to develop more advanced machines or enter the personal computer market. Despite this setback, 1984 marked a turning point with the launch of the Macintosh, which introduced a groundbreaking new vision for personal computing. However, the original “Macintosh 128K” fell short of the ambitious sales expectations set by Steve Jobs.

In the years that followed, the industry rapidly evolved. Companies began releasing computers with more powerful hardware, and operating systems became increasingly user-friendly, driven by the widespread adoption of graphical user interfaces. The turbulent start of the 1980s soon gave way to an era of remarkable innovation, producing iconic machines such as the Atari ST, Commodore Amiga, Acorn Archimedes, and NeXT. This period also marked the twilight of the 8-bit era, as the home computers that had once defined personal computing gradually faded into history.



A founder in exile, Part 2

Jack Tramiel, the hard-driving founder and CEO of Commodore International, was forced out of the company in January 1984 after a power struggle with the board of directors. Tramiel had built Commodore into a major player in the personal computer industry with aggressive pricing and business tactics, particularly during the Commodore price wars, which decimated competitors like Texas Instruments. However, his abrasive management style and clashes with other executives, including key board member Irving Gould, created mounting tension.

Gould, who controlled much of Commodore's financing, grew increasingly frustrated with Tramiel's unilateral decision-making and relentless cost-cutting, which often strained relationships with suppliers and employees. Their differences came to a head in early 1984 when Gould orchestrated Tramiel's ouster, citing the need for new leadership to navigate Commodore's rapid growth and evolving market challenges.

The repercussions were significant. Tramiel's departure left Commodore without its most visionary and aggressive leader at a critical time. While the Commodore 64 remained a massive success, the company struggled to innovate and manage the transition to newer technologies. Meanwhile, Tramiel immediately acquired Atari's consumer division, where he launched the Atari ST, a direct competitor to Commodore's Amiga line. This move created fierce competition between the two companies, further destabilizing Commodore.

Ultimately, Tramiel's exit marked the beginning of Commodore's long-term decline, as the company lost its edge in both leadership and strategic vision. It also cemented Tramiel's reputation as a ruthless and polarizing figure in the tech industry.

Tatung Einstein

The **Tatung Einstein**, released in 1984, was a home computer that aimed to offer strong competition to the dominant systems of the time, such as the **Commodore 64** and the **ZX Spectrum**. Powered by the **Zilog Z80** processor running at 3.5 MHz, the Einstein was designed for both personal and educational use. Its hardware was comparable to other 8-bit machines of the era, but it offered a few unique features that set it apart.

One of the most notable features of the Tatung Einstein was its **high-resolution graphics**. It supported a 256x192 resolution and could display up to 16 colors, which was above average for computers of its class, making it a good option for graphics-oriented applications. The machine also featured **sound capabilities** with a built-in **3-channel sound chip**, which allowed it to produce richer audio compared to some other 8-bit systems.

Despite the technical advantages, it failed to capture significant marketshare, and it was discontinued.



Characteristic	Specification
Year of Release	1984
CPU	Z80A (4 MHz)
Number of Colors on Screen	16
Number of Sound Channels	3
Available Memory	64KB RAM
Display Resolution (Max)	256x192

Commodore 16

The Commodore 16, released in 1984, was an 8-bit home computer developed by Commodore International. It was designed to fill the gap between the Commodore 64 and the C64's younger sibling, the Commodore 64's budget-friendly Commodore 64. Aimed primarily at the home and educational markets, the C16 had modest success but ultimately struggled against both higher-end computers like the C64 and more affordable alternatives.

The Commodore 16 was powered by a 6510 microprocessor running at 1.0 MHz, which was slower than the C64's 6510 processor. It featured 16 KB of RAM, which was less than the C64 but suitable for basic computing needs. This RAM limitation was one of the key drawbacks of the system.

The C16 supported a library of software, primarily educational and productivity applications, but its game library was more limited compared to the C64.



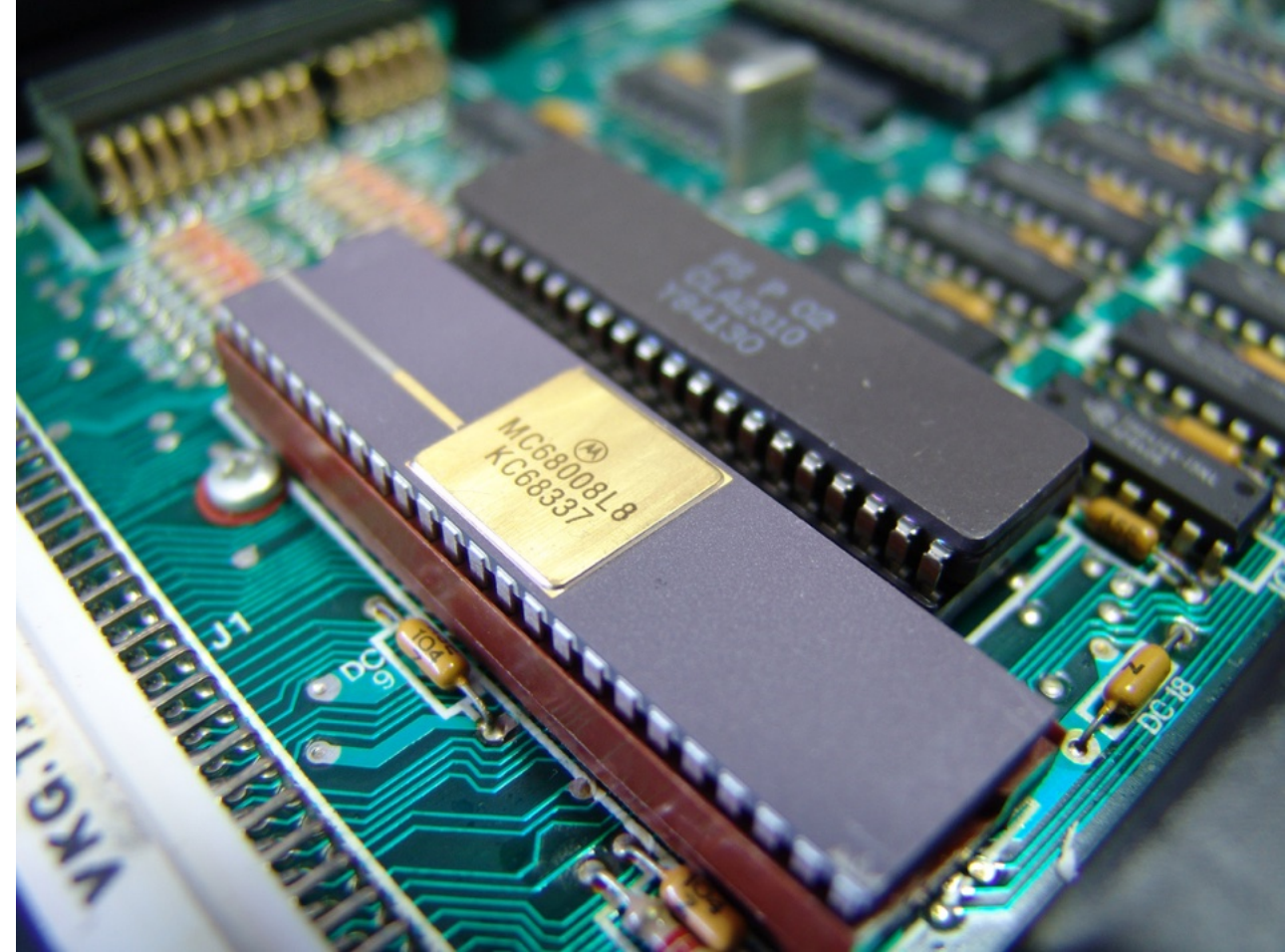
The Commodore 16 was discontinued by the end of 1986, with its limited success contributing to its legacy as a brief experiment in the 8-bit home computer market.

Characteristic	Specification
Year of Release	1984
CPU	MOS 7501 or 8501 (0.89 to 1.76 MHz)
Number of Colors on Screen	121
Number of Sound Channels	2
Available Memory	16 KB RAM
Display Resolution (Max)	320 x 200

Sinclair QL

Sir Clive Sinclair was nothing short of a visionary, albeit a flawed one. His ambition for the QL (Quantum Leap) was to create a machine that would leapfrog the competition by offering 16-bit computing at an affordable price, well before any of its competitors could deliver similar technology. The computer's design was intended to outperform the popular Commodore 64 and other 8-bit systems of the time while providing more advanced features. Sinclair was racing to release the QL as the first mass-market 16-bit home computer, hoping to capitalize on the growing demand for personal computing. This was at a time when IBM PCs and the Apple Macintosh were already pushing the boundaries of computing, and Sinclair wanted to ensure his company remained a leader in the personal computing revolution.

However, despite its ambitious goals, the QL was plagued by design limitations that ultimately held it back. One of the key issues was its choice of CPU, the Motorola 68008



(image top right), a 16-bit microprocessor that was paired with an 8-bit data bus. While this CPU was technically capable of 16-bit operations, the 8-bit bus severely restricted its overall performance. The system's overall speed was far slower than expected, especially when compared to fully 16-bit rivals, such as the Atari ST.

Another significant limitation of the QL was its use of microdrives for storage. The Microdrive system, which used small, inexpensive tape cassettes, was innovative but prone to reliability issues. The drives were much slower than disk drives, which made loading and saving data frustrating for users. Additionally, the QL's limited RAM (128KB, later

upgraded to 640KB) and the lack of proper graphics hardware acceleration made it less suited for more demanding applications and games, further limiting its appeal.

While the QL's specifications made it seem like a powerful machine on paper, its technical shortcomings and rushed release meant it failed to meet expectations. Despite Sinclair's vision, the QL faced stiff competition from other 16-bit computers, like the Atari ST and the Amiga, which offered better performance, reliability, and more advanced features.

The QL's failure to live up to Sinclair's ambitious goals ultimately led to its discontinuation. However, it left an important legacy in the computing world. It was one of the earliest attempts to bring 16-bit computing to the mass market, and although it did not succeed commercially, it contributed to the evolution of personal computers. It also introduced some early ideas about affordable computing



that would shape later systems. Despite its limitations, the Sinclair QL is remembered as an ambitious but ultimately flawed step in Sinclair's long history of innovation.

Characteristic	Specification
Year of Release	1984
CPU	Motorola 68008
Number of Colors on Screen	8
Number of Sound Channels	1
Available Memory	128 KB RAM
Display Resolution (Max)	512x256

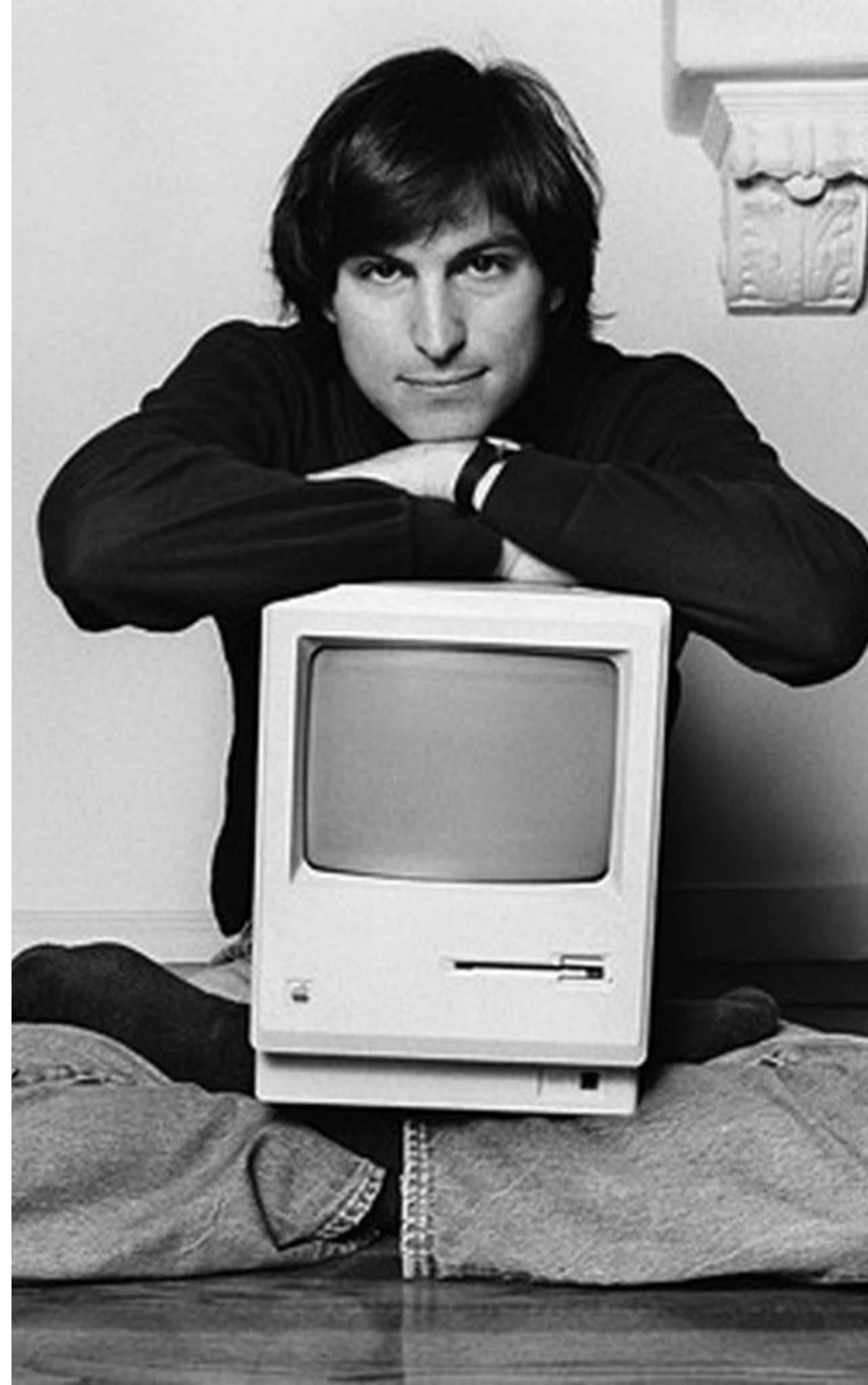
Macintosh

"Hello, I am Macintosh... it sure feels nice coming out of that bag".

And with these historic words, Macintosh presented itself to a crowded audience that went wild, after Steve Jobs pulled it out of a bag and started it.

The Macintosh, or Mac as it was and is known, the "bicycle for the mind" as Steve tried to call it -to the defiance of his team- had a shaky start. Jeff Raskin, one of the first Apple employees and responsible for documentation, was interested in creating a low-cost computer, based on an 8-bit CPU. Apple gave him permission to pursue his goal, so Jeff started recruiting engineers to his personal pet project he called "Macintosh", after his favorite type of Apple.

At the same time, Apple was busy working on a new project for a ground-breaking machine that would redefine personal computing and -hopefully- regain some marketshare from IBM, whose first PC, the 5150, managed to grab the attention of every business in the country.



The top-secret project was known as “Lisa”, a name selected after the daughter of Steve Jobs (even though, for some years, he denied the connection). Lisa was going to be the first personal computer to be sold to the market that was based entirely on a Graphic User Interface. It was the product of the famous Apple visit to the XEROX PARC, that allowed Steve Jobs and his engineers to view the amazing technology that was developed there, including the STAR, the first ever computer that relied on a GUI.

However, Steve Jobs became a liability of the Lisa project and was exiled from it (see “A founder in exile, Part 1”). And he was soon left to find other projects to pester. Around that time, Burrell Smith, a charismatic engineer, managed to replace the 8-bit CPU of the Macintosh project with a fully-fledged Motorola 68000 (see “Transplanting the Mac”), essentially creating the basic hardware of the Lisa for a fraction of the price.

When Steve (soon) found out, he realised he had a potential winning product that would allow him to become significant again -and this time take his personal (petty) revenge against his (own!) Lisa team. Jeff was almost immediately shown the door of the project, forcing him to

quit the company. Steve started recruiting talent from within the company, including members of the Lisa team. Soon, he had a rag-tag team of incredible programmers and engineers, ready to follow his every wish. Apple management did not seem bothered by this. Indeed, at first they thought -mistakenly- they could keep him busy and away from their real product, the Lisa.

The team was soon joined by Bill Atkinson, who created Quickdraw, the technology that allowed the machine, in software, to manipulate windows and menus with great ease and incredible speed. In fact, when

Bill Gates was shown an early prototype, he was so impressed with the response, he asked what kind of hardware they used. When Andy Hertzfeld answered “It’s all in software”, a furious Jobs told him to shut up!

Very soon the project grew into a much grander plan than what Jeff had initially imagined. But this was no longer Jeff’s project - this was entirely a new computer product, keeping only the original name, and a smaller footprint. The price, unfortunately, would soon sky-rocket, albeit starting at a much lower price-point than the Lisa...

**“The best thing Steve did, was to create a sh.t deflecting umbrella over the project”
— Andy Hertzfeld**

The original Macintosh, or Mac 128, as it is known, because of the amount of RAM installed, relied heavily on a single floppy drive to read and write data. From this floppy drive, the operating system would be read, and then the computer would allow the user to insert other discs with applications. This was rectified with later models that introduced an internal hard drive for storing the operating system, or by using a dual floppy drive setup.

Steve Jobs resisted to the notion of having the first Macintosh be upgradeable, something that he attempted -but failed- to do with the Apple II. In this case, the Mac proved to be almost useless, since the paltry 128 KB of RAM were barely enough to load the operating system. Fortunately, very soon the company released a model with 512 KB of RAM, the "fat" Macintosh as it is known today.

Even though the machine was ground-breaking for its time, with a unique and highly intuitive graphical user interface, the high price point, the limitations of the RAM in the first model, and the lack of software support, would doom the



machine, and force Apple to rely to the aging Apple II for a few years more...

Characteristic	Specification
Year of Release	1984
CPU	Motorola 68000
Number of Colors on Screen	Monochrome
Number of Sound Channels	1
Available Memory	128 KB RAM
Display Resolution (Max)	512x342

IBM PC/AT

When IBM entered the personal computer market with an open-architecture machine -a first for the company-, it was met with unprecedented success. The company was so established and reliable, that the saying "nobody got fired for choosing IBM" was becoming true, when selections were made for the right computer for a business.

IBM did not rest on its laurels. After the original IBM PC and its successor, the IBM XT (1983), the company released a much more advanced computer, the **IBM PC/AT** (Advanced Technology), in 1984. It marked a significant leap forward in personal computing and set new standards for the industry. The PC/AT was designed for business users who required greater performance and expandability, and its advanced features helped establish IBM's dominance in the computer market during the 1980s.

The PC/AT was powered by the **Intel 80286 processor**, running at **6 MHz** (later models featured an 8 MHz version).



This 16-bit processor offered a substantial performance improvement over the 8088 used in earlier IBM PCs, enabling faster processing and multitasking capabilities. The system came with **256 KB of RAM** as standard but could be expanded to **16 MB**, a significant amount for its time. For storage, the computer introduced larger hard drives, ranging from 20MB to 30MB, which were faster and more reliable than earlier models. It also featured a **1.2 MB 5.25-inch floppy disk drive**, offering higher capacity than the 360 KB drives of previous IBM PCs. Another important characteristic of the PC/AT architecture, was the ISA (Industry Standard Architecture) 16-bit bus, which became standard for expansion cards. This gave the computer

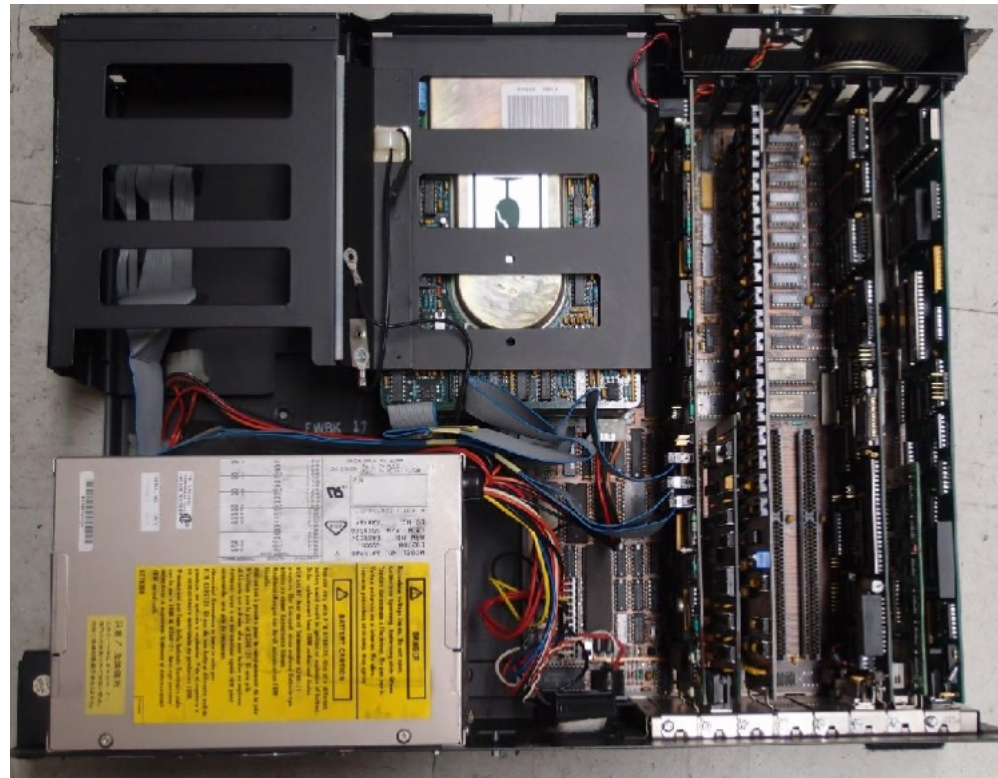
unparalleled flexibility, since it allowed for greater expandability compared to the earlier 8-bit bus.

To complement the computer and its significantly upgraded capabilities, a new and improved version of the Disc Operating System was required. The PC/AT run PC-DOS 3.0, which allowed it to take advantage of the advanced features of the 80286 processor, including improved disk handling and larger storage support.

Even though the computer was a significant upgrade compared to the XT, it was meant with issues upon release: the first batch of hard drives had serious reliability problems, and had to be replaced after loss of data. Additionally, the new machine offered significant performance gains over the previous generation, but it came at a significant cost, at a time when the competition was introducing computers with similar performance at a much reduced price. Very soon, Compaq would introduce

its Deskpro 286, a faster computer, offering IBM compatibility, at a much lower price.

The IBM PC/AT remains a significant milestone, since it became a standard for business computing and set a benchmark for the personal computer industry. Its **ISA bus architecture** became the foundation for decades of PC expansion card design, ensuring its influence long after its discontinuation. The AT's design philosophy and technical standards helped solidify the IBM-compatible PC market, shaping the future of personal computing.



Characteristic	Specification
Year of Release	1984
CPU	Intel 80286
Number of Colors on Screen	16 (EGA)
Number of Sound Channels	1
Available Memory	256 - 512 KB RAM
Display Resolution (Max)	640x350 (EGA)

IBM Portable

The IBM Portable Personal Computer (model IBM 5155) was part of IBM's journey toward creating more accessible and portable computing solutions. This journey began nearly a decade earlier with the release of the IBM 5100 in 1975, one of the first portable computers in history. Unlike the 5155, the IBM 5100 was a self-contained machine with an integrated monitor, keyboard, and data storage, designed for scientists and engineers. Although revolutionary for its time, the 5100 was expensive and targeted a niche market, limiting its widespread adoption.

By the early 1980s, IBM sought to create a portable computer with broader appeal. Building on the success of the IBM PC (1981) and the IBM PC XT (1983), the company introduced the IBM 5155 in 1984. Unlike the 5100, the 5155 was designed to be more affordable and compatible with IBM's growing ecosystem of personal computers, making it a practical choice for business professionals. This shift marked IBM's transition from pioneering early



portable machines like the 5100 to producing more commercially viable portable PCs.

The IBM Portable Personal Computer, released in February 1984, was IBM's first attempt at creating a truly portable version of its popular IBM PC. Designed for business professionals, it was often referred to as a "luggable" computer due to its weight of 13.6 kg and suitcase-like design. Despite its bulk, it offered the power of a full desktop PC in a transportable format, appealing to users who needed computing on the go.

The IBM 5155 was powered by the Intel 8088 CPU, running at 4.77 MHz, the same processor as the original IBM PC. It came with 256 KB of RAM, which was expandable to 512 KB, and featured two 5.25-inch floppy disk drives for storage. However, unlike many later portable computers, it lacked a hard drive. The built-in 9-inch monochrome CRT screen could display 25 lines of text or CGA graphics, making it a practical solution for office tasks and basic graphical applications. It also included standard PC ports for connecting peripherals like printers and modems, and it ran on PC-DOS, IBM's version of MS-DOS.

The 5155 was essentially a repackaged IBM PC XT, retaining the desktop model's processing power and expandability while adapting it to a portable form factor. However, its bulk and reliance on AC power limited its portability compared to later innovations in mobile computing. Despite these drawbacks, it became a



popular choice among professionals who required the functionality of a full PC while traveling.

When compared to competitors like the Compaq Portable, which debuted in 1983, the IBM 5155 lagged slightly in innovation. The Compaq Portable was lighter and introduced earlier, giving it a competitive edge. However, IBM's strong brand reputation and the compatibility of the 5155 with the IBM PC ecosystem helped it carve out a significant market share.

The IBM Portable Personal Computer was an important milestone. While far from the lightweight laptops we know today, it bridged the gap between desktop systems and true portable devices, laying the groundwork for the advancements in mobility that would follow.

Characteristic	Specification
Year of Release	1984
CPU	Intel 8088 (4.77 MHz)
Number of Colors on Screen	Monochrome
Number of Sound Channels	1
Available Memory	256 - 512 KB RAM
Display Resolution (Max)	320x200



IBM recognised early the prospects of the personal computer market, and decided to release a machine to cater to the needs of the home user. The IBM PCjr (model 4860) was announced in **November 1983** and subsequently released in March 1984, as IBM's first attempt to enter the home computer market. It was conceived to capitalize on the success of the IBM PC in business computing by offering a more affordable, user-friendly system for home users, students, and small businesses. IBM aimed to compete with popular home computers like the Commodore 64, Apple IIe, and Atari 8-bit series, bridging the gap between home and professional computing.

The PCjr was designed to provide **IBM PC compatibility**, enabling home users to run many popular business applications like word processors and spreadsheets, alongside educational and gaming software. IBM anticipated that the PCjr would dominate the growing home computer market, leveraging the company's

for



reputation
quality and

compatibility. Its unique features were intended to set it apart from competitors, offering a more powerful, versatile machine with IBM's trusted name. As a computer, it was also designed to support some unique features, some of which were ahead of their time:

Chiclet Keyboard: The PCjr came with an innovative wireless infrared "chiclet" keyboard, which was meant to be

a convenient and modern design but ultimately proved uncomfortable for typing and unreliable in use.

Cartridge Ports: It featured two ROM cartridge slots for easy loading of software and games, aimed at simplifying use for non-technical users.

Improved Graphics and Sound: The PCjr introduced the **Enhanced Graphics Adapter (EGA)**, offering better visuals than the standard CGA of the IBM PC. It also had three-voice sound capabilities, making it better for games and multimedia than its business-focused counterpart.

Expandability: Though compact, it had a sidecar expansion system for adding peripherals like additional memory or a floppy disk drive.



Despite its innovations, the IBM PCjr faced significant issues that tarnished its reputation. Although marketed as IBM PC-compatible, it struggled with software compatibility due to differences in hardware and memory architecture. Priced at \$1,269 (over \$3,500 today), it was far more expensive than competitors like the Commodore 64, which offered comparable or superior gaming capabilities for a fraction of the cost. The chiclet keyboard, a notable feature, was heavily criticized for being uncomfortable, unresponsive, and unreliable due to its infrared connection. Additionally, the base model's 64 KB of RAM (expandable to 128 KB) was inadequate for many applications, and its Intel 8088 processor at 4.77 MHz often lagged behind competitors in performance, particularly for graphics-intensive tasks. These flaws combined to undermine the

Characteristic	Specification
Year of Release	1984
CPU	Intel 8088 (4.77 MHz)
Number of Colors on Screen	16 (EGA)
Number of Sound Channels	3
Available Memory	64 KB RAM (expandable to 128 KB)
Display Resolution (Max)	320x200

Tandy 1000

The Tandy 1000, released in 1984 by Radio Shack, was an affordable IBM PC-compatible computer for homes and small businesses. Powered by an Intel 8088 processor at 4.77 MHz with 128 KB of RAM (expandable to 640 KB), it featured Tandy Graphics Adapter (TGA) and three-voice sound, offering superior multimedia capabilities over IBM's PC speaker. Bundled with MS-DOS and DeskMate, a user-friendly graphical interface, it supported dual 5.25-inch floppy drives or a hard drive in later models.

Outperforming competitors like the IBM PCjr in compatibility, expandability, and price, the Tandy 1000 became popular among families and hobbyists. It also surpassed the Apple IIe by offering better compatibility with IBM PC software, the emerging industry standard. While the Commodore 64 was cheaper, it lacked IBM compatibility, limiting its professional use. The Tandy 1000's balance of performance, price, and versatility made it a dominant force in the mid-1980s home PC market.



Characteristic	Specification
Year of Release	1984
CPU	Intel 8088
Number of Colors on Screen	16 (CGA)
Number of Sound Channels	1
Available Memory	256 KB RAM
Display Resolution (Max)	640x200 (CGA)

Oric Atmos

The Oric Atmos was an 8-bit personal computer released in 1984 by the British company Oric International, aimed at the home and educational markets. It was a successor to the Oric-1, offering several improvements in both hardware and design. The Atmos was powered by a 6502A processor running at 1 MHz and came with 48 KB of RAM, which could be expanded to 64 KB with an additional memory module. It featured a 16-color graphics display, with a resolution of 300 x 200 pixels, which was a step up from its predecessor's capabilities. The sound was handled by the Oric's AY-3-8910 audio chip, which provided three-channel sound, making it suitable for simple music and sound effects.

One of the Atmos' notable features was its improved keyboard, which was more comfortable and responsive than the Oric-1's, and it included an integrated cassette tape interface for loading and saving data. Unlike many contemporaries, the Atmos also had an RGB video output,



offering better video quality for users with compatible displays. It had a significant software library, and supported a variety of peripherals like printers and disk drives.

Despite its initial appeal, the Atmos struggled in the marketplace due to competition and some technical limitations, ultimately ending its line in the mid-1980s.

Characteristic	Specification
Year of Release	1984
CPU	MOS 6502A (1 MHz)
Number of Colors on Screen	16
Number of Sound Channels	3
Available Memory	48 KB RAM
Display Resolution (Max)	320x200

Alan Michael Sugar

Sugar understood the market. He could clearly see where the road ahead led. He did it multiple times, selling cheap -but with a high-class look- audio systems to the masses. He made a fortune, and even created a company that bared his own name - cutting the word "TRADing" at the end. After (a few) years of watching a new market emerge, that of the "home" computer, he decided to take a nose dive. He analysed all the pros and cons of his competitors: expensive computers that included storage and monitor, or inexpensive systems that connected to the (only, at the time) TV at home, with added money required to purchase a tape recorder or a pricier floppy drive. He realised there was a huge potential for a new series of computers that could offer the young kid next door a computer at a fraction of the cost of the competitors. And so he did - he released, within a (rather) tiny timeframe, a series of color personal computers that came with integrated storage (tape or floppy), and an inexpensive green-screen monitor. His gamble paid off - soon, he was literally printing money!



Amstrad CPC 464

The Amstrad CPC 464 was a significant milestone in the history of home computing, released in 1984 by Amstrad, a British electronics company founded by Alan Sugar. The CPC line, which stood for Colour Personal Computer, was designed to address the growing demand for affordable, powerful personal computers for both home and educational use. Amstrad's goal was to offer a comprehensive, all-in-one solution that included a computer, monitor, and tape deck at a competitive price, making computing accessible to a broader audience.

The development of the CPC 464 began in the early 1980s, during a time when home computing was becoming increasingly popular, yet many computers still

lacked user-friendly integration. Amstrad chose to base the system on the Zilog Z80 microprocessor, which was widely used in home computers and offered good performance and flexibility. The computer featured 64 KB of RAM (expandable to 128 KB) and a 512 KB ROM that contained the operating system and built-in software, including a version of the Locomotive BASIC programming language.

It also used Amstrad's CP/M, a custom operating system, ensuring that the costs were kept low, but there was no compatibility with other computers outside the Amstrad ecosystem. Amstrad also decided to integrate a cassette tape drive for storage, which helped to reduce the overall cost of the system, making it affordable for the mass market. The green screen was replaced with a colour monitor for the CPC line, making it appealing for both gaming and productivity.



The main idea behind the CPC 464 was to offer a complete package that would require no additional peripherals to get started. It came bundled with a colour monitor, keyboard, and tape deck, unlike many of its competitors, which required users to purchase additional accessories. This made the system especially appealing for users new to computing, who wanted a ready-to-go solution at an affordable price.

In the UK, the CPC 464 was initially well-received, thanks to its competitive pricing and integrated design. It faced stiff competition from systems like the ZX Spectrum and Commodore 64, both of which were already established in the market. However, Amstrad's strategy of bundling the system with a colour monitor and offering a comprehensive package allowed it to attract customers looking for a complete, easy-to-use computer. The CPC 464's lower price point and inclusion of a keyboard (a feature that some competitors lacked) made it appealing for home users and educational markets.

Internationally, the CPC line had a mixed reception. While it performed well in the UK and Europe, it struggled to gain significant market share in North America, where established players like the Commodore 64 and Apple II

dominated the scene. The CPC 464 was eventually succeeded by other models in the CPC series, such as the CPC 664 and CPC 6128, which offered additional features like disk drives and enhanced graphics, but Amstrad's competition in markets outside of Europe proved challenging.

In summary, the Amstrad CPC 464 was a well-designed, affordable machine with competitive advantages in terms of value for money, and ease of use, particularly for first-time users.



Characteristic	Specification
Year of Release	1984
CPU	Zilog Z80 (3.5 MHz)
Number of Colors on Screen	16 - 48 KB RAM
Number of Sound Channels	3
Available Memory	64 KB RAM
Display Resolution (Max)	320x200

Jack Goes Atari

Jack Tramiel could not and would not stay out of the computer business for long. After realising that Warner Communications was in dire straits (and one of the main reasons was the video game crash he helped create) he made his move... Jack convinced Warner to relinquish their control of the computer and console division of the company to him, using money they loaned him.

Immediately upon his return, Tramiel used his skills to recognise which sectors of the market he could focus on, and where he could pursue his competitors. Tramiel had been instrumental in Commodore's success, particularly with the Commodore 64, and he had the skills and experience -and stamina- for a second coming. The acquisition of the consumer division of Atari was completed by July 1984, giving him -and his trusted sons- complete control of the company. This time, all decisions

were his, without the shackles he had to suffer with Gould at Commodore.

Tramiel brought with him several key personnel from Commodore, including Leonard Tramiel (his son) and other former Commodore employees, including the charismatic engineer Shiraz Shivji, to help establish and lead Atari's new direction.

This transition marked a significant shift for Atari, which refocused on personal computers, and Tramiel's leadership influenced the development of products like the Atari ST. His move was a major reshaping of both Atari and the broader personal computer industry in the mid-1980s. He would soon follow his own mantra "computers for the masses and not for the classes", and completely reshape the 16-bit market with his new offerings.

Imperial March

The day had come. Jack and his sons arrived at the (almost empty) parking lot of Atari and, with confidence, started walking towards the main entrance. It was not long ago that the founder of Commodore quit the company he created, after a long and bitter dispute with his main financier, the enigmatic Gould. Now, the time to get back at Gould and prove, once again that he mattered to the computer industry, had finally come. And right outside of one of his former and main adversaries.

Outside Atari, nothing reminded the vibrant sounds and crowded areas of just a few years back, when the colossal company was the crown jewel -if not infamous- of the entire video games industry, as the fastest rising tech company ever. As the entrance door was opened, so that the new management could enter the premises, music started playing from speakers that were carefully placed years ago, for all the partying that went around. At first, there was a puzzled look in their faces, and then came the

recognition of one of the most famous theme songs to ever grace a Hollywood movie: the Imperial March, created by John Williams for the Star Wars franchise, a song that always predated the entrance of the evil Empire and its Dark Lord(s), mainly Darth Vader. And, while the theme was playing, one of the employees started shouting over the intercom: "Imperial Stormtroopers have entered the base!".

Judging by what happened next, he was not far off- Jack would axe a large percentage of the (skeleton) personnel that was left in the company, along with most of the product lines. And he would soon release the "Jackintosh"!



Atari 65 XE

When Jack Tramiel acquired Atari in 1984, the company was in a state of turmoil. Atari, once the dominant force in the video game and personal computer markets, had fallen on hard times, struggling with poor management, a fading reputation, and competition from emerging 16-bit computers. Tramiel, the visionary behind the Commodore 64, recognized the potential of Atari's brand and its legacy in the gaming world, but knew the company needed a fresh direction. Upon taking control, Tramiel quickly set to work restructuring the company, cutting costs, and refocusing on both the gaming and home computing markets. His key focus was to revitalize the Atari brand with new, more affordable and powerful personal computers that could appeal to both home users and professionals. Tramiel also sought to regain Atari's foothold in the computer market by building upon the success of the Atari 8-bit line while preparing for a new generation of computers. One of his



major steps was the creation of the XE series, which included the Atari 65 XE, marking a departure

from previous models and aligning the company's strategy with more modern, competitive designs. By streamlining production, lowering prices, and innovating on hardware, Tramiel laid the foundation for Atari's revival in the mid-1980s.

The Atari 65 XE, released in 1985, was part of Atari's 8-bit family of computers, but it marked a departure from the earlier designs in the series. It was developed as part of the XE series, which also included the 130 XE and 800 XE, and was intended to be a more advanced, budget-friendly successor to the Atari 800 XL. The primary goal was to provide better performance, a more modern design, and enhanced features that could appeal to both home users

and enthusiasts, while maintaining backward compatibility with older Atari 8-bit software.

The design responsibility for the 65 XE largely fell to Atari's internal teams, who sought to modernize the aesthetics of the previous 8-bit machines. The departure from the previous design was evident in the smaller, sleeker, and more compact case, which was clearly influenced by the Atari ST line that followed a year later. This was a conscious decision to bring a more professional and contemporary look to the 65 XE, with a minimalist design that reflected the style of the ST series. The case, with its smooth lines and compact form, made it look like a "small" version of the Atari ST, signaling a shift towards more modern and user-friendly personal computer designs, moving away from the bulkier appearance of earlier models like the 800 XL.

The Atari 65 XE featured a 6502C processor running at 1.79 MHz, offering enhanced performance over its predecessors due to internal optimizations, allowing for



better multitasking and faster operations. With 64 KB of RAM, it was a significant upgrade compared to older models, making it more suitable for a broader range of applications, including productivity tools, educational software, and games. While not as advanced as the Atari ST line, the 65 XE boasted improved graphics and sound, including a richer color palette and better audio output, which made it more appealing for multimedia and gaming. Its compact design was sleeker and more modern, attracting consumers looking for a smaller machine that could easily fit into homes or offices. Additionally, it maintained full backward compatibility with previous Atari 8-bit software, allowing users to continue using their existing programs without any issues.

Characteristic	Specification
Year of Release	1985
CPU	MOS 6502C (1.79 MHz)
Number of Colors on Screen	16
Number of Sound Channels	3
Available Memory	64 KB RAM
Display Resolution (Max)	320x240

SixteenThirty-two

Shiraz (Shivji) knew he was knee-deep in trouble: he followed Jack to Atari, before realising how truly bad the situation was: the products were far behind schedule or underperforming, the competition was kicking them left and right, Commodore was rumored to be working on a new, powerful home computer, and they were bleeding talent and money... However, him being a very persistent person, understood that the only solution was a new, powerful computer sold at rock bottom price. Jack gave him his blessing, but he also gave him a strict deadline. He growled, with his usual tone "Get the machine ready in 5 months or else...". Shiraz assembled a small, dedicated team, and began the design of a new, inexpensive, yet powerful computer. He decided to use an all-in-one, low-profile case that housed the motherboard under the keyboard, with an external power supply and floppy drive. To be able to match the performance of the Macintosh, he used a Motorola 68000 CPU, and to cut the costs even

further, instead of using dedicated graphics and audio chipsets -something Atari already owned and used in their 8-bit line- he went with the basic "shifter" for graphics and the trusted, inexpensive but low quality Yamaha audio chipset used in budget computers such as the Amstrad CPC line. As an afterthought, that would later prove (almost) life-saving, they included MIDI ports on the side of the machine. And the final part: a GUI, licensed from Digital Research! Indeed, "power without the price". But, soon, (another) new kid on the block would arrive, this time from Commodore, a unique machine called "Amiga".



Atari 520 ST

The Atari 520 ST was developed in the early 1980s under the leadership of Shiraz Shivji, who faced significant challenges in creating the system within a tight time frame. One of the key decisions was the choice of the Motorola 68000 CPU, which was selected for its 16/32-bit architecture, offering better performance compared to the 8-bit processors of the time. This decision enabled the 520 ST to handle more complex applications, especially in the realm of graphics and business software.

The system came with 512 KB of RAM, expandable to 1 MB, which was considered generous at the time and allowed for more advanced software.

The GEM (Graphics Environment Manager), which Atari licensed from Digital Research, was another crucial feature that set the Atari ST apart. GEM provided a graphical user interface (GUI) that resembled the Macintosh, making the system more user-friendly and accessible. It offered a



desktop metaphor, with icons and windows, which were revolutionary for personal computers at the time, particularly in the home and professional office markets. GEM was also designed to be lightweight and efficient, which was particularly useful in managing graphical applications, for which the Motorola 68000 CPU (with its 16/32-bit architecture) excelled. This allowed the Atari ST to run a variety of graphical applications, including Desktop Publishing software, giving it an edge over competitors with simpler systems.

The Atari 520 ST supported three distinct graphic resolutions: low-res (320 x 200 pixels), medium-res (640 x 200 pixels), and high-res (640 x 400 pixels). While the low

and medium resolutions could be displayed on a standard television or monitor, the high-resolution mode required a separate RGB monitor due to its higher pixel density and need for better color depth and clarity. This requirement meant that the 520 ST was positioned more as a multimedia and professional machine, able to deliver advanced graphics for design, video editing, and gaming, but also with limitations compared to other systems in terms of display compatibility.

In comparison to the Apple Macintosh, the Atari 520 ST held its own in several important areas. The Macintosh, released just a year earlier in 1984, had the advantage of a higher-quality built-in display, superior GUI through System Software, and a more refined design. However, the Atari 520 ST offered more flexibility—especially for musicians with its MIDI ports—and came at a significantly lower price. The Macintosh, on the other hand, had limited expansion options and was more expensive, which made the Atari ST a highly attractive option for consumers looking for powerful performance at a better value. In terms of raw performance, the Motorola 68000 processor in both machines was the same, but the ST had better graphics performance in some cases, particularly in the higher resolutions.

The Atari 520 ST became a pivotal computer for musicians due to its inclusion of MIDI ports—a groundbreaking feature for personal computers at the time. These ports allowed the Atari ST to connect directly to musical instruments, synthesizers, and other MIDI-enabled devices. Many music software applications, such as Cubase, were developed specifically for the ST, and the system's MIDI capabilities contributed greatly to its success in the music industry, a niche the Apple Macintosh initially overlooked.



Characteristic	Specification
Year of Release	1985
CPU	Motorola 68000 (8 MHz)
Number of Colors on Screen	16
Number of Sound Channels	3
Available Memory	512 KB
Display Resolution (Max)	320x200

Amstrad CPC 6128

The Amstrad CPC 6128, released in 1985, was a versatile 8-bit computer that catered to both gaming enthusiasts and professional users. Building on the success of its predecessors, the CPC 464 and CPC 664, it offered notable enhancements in graphics, audio, and overall functionality. The CPC 6128 featured 128 KB of RAM, double that of earlier models, and came equipped with a built-in 3-inch floppy disk drive, which made it more appealing to small business users and those looking for reliable data storage.

It supported the CP/M operating system, a widely used platform for productivity software, making it suitable for tasks like word processing, spreadsheets, and database management. Popular applications included Locoscript for word processing, SuperCalc for spreadsheets, and dBase II for database management, all of which benefited from the CPC 6128's robust hardware.



The computer's **graphics capabilities** were particularly impressive for its time, offering three distinct modes to suit different needs. **Mode 0** provided a resolution of **160x200 with 16 colors**, making it ideal for vibrant games and multimedia applications. **Mode 1** balanced detail and color with a resolution of **320x200 and 4 colors**, while **Mode 2** offered high-resolution monochrome visuals at **640x200 with 2 colors**, primarily used for text-based applications. These modes allowed developers to create a diverse range of software, from detailed adventure games to professional productivity

tools. Combined with Amstrad's proprietary color or green-screen monitors, the CPC 6128 delivered sharp and consistent visuals, avoiding the drawbacks of relying on standard televisions.

On the audio front, the CPC 6128 utilized the AY-3-8912 Programmable Sound Generator (PSG), which offered 3 independent sound channels capable of producing polyphonic music and complex sound effects. This chip allowed developers to craft immersive audio experiences, making the CPC 6128 a standout for gaming and multimedia. The combination of rich graphics and audio capabilities placed the CPC 6128 in a strong position against competitors like the Commodore 64 and ZX Spectrum 128, particularly in the European market.

The CPC 6128 also supported a wide range of peripherals, enhancing its functionality. It included ports for printers, enabling users to create professional-quality documents, as well as joysticks for gaming and external disk drives to expand storage capacity. The expansion port allowed for memory upgrades, ROM

cartridges, and other third-



party add-ons, making the system adaptable to various needs. Additionally, it retained compatibility with cassette-based software through a tape

recorder interface, ensuring a smooth transition for users upgrading from the CPC 464.

As a gaming platform, the CPC 6128 excelled with a robust library of titles that took full advantage of its hardware. Popular genres included platformers like *Bomb Jack*, adventure games like *The Hobbit*, and shoot-'em-ups like *R-Type*. Its ability to handle smooth scrolling, detailed sprites, and rich soundtracks made it a favorite among gamers.

Characteristic	Specification
Year of Release	1985
CPU	Z80A (4 MHz)
Number of Colors on Screen	16
Number of Sound Channels	3
Available Memory	128 KB RAM
Display Resolution (Max)	640x200

Olivetti Prodest PC 128

Olivetti, a pioneer in computers, entered the home and office computer market with the Prodest PC 128, a design borrowed from the Thomson MO7 line. It shared many of its features, including the integrated tape player, essential for reading data like home office applications and games.

The Olivetti Prodest PC 128 was equipped with the Zilog Z80 processor, running at 3.5 MHz, and offered 128 KB of RAM, which was a considerable amount of memory for the time, especially compared to many other home computers. The system supported a 16-color graphics mode with a resolution of 256x192 pixels, which allowed for clear text and basic graphics. It used a cassette tape drive for storage, but also supported external floppy disk drives for those who needed more storage options.

The system featured an integrated keyboard with a functional layout, making it an easy-to-use computer for personal and educational tasks. Additionally, the PC 128 supported RGB and composite video outputs, allowing

users to connect it to various monitors and televisions. The Olivetti Prodest PC 128 was well-received in Italy, where Olivetti had a strong presence. The system was appreciated for its affordability and compatibility with business software, making it appealing to small businesses and educational institutions.



Characteristic	Specification
Year of Release	1986
CPU	Zilog Z80 (3.5 MHz)
Number of Colors on Screen	16
Number of Sound Channels	1
Available Memory	128 KB RAM
Display Resolution (Max)	256x192

Hi-Toro

The day had arrived. Jay Miner, the charismatic engineer, and his team were standing at the gates of **Atari**, their backs against the heavy winds of uncertainty. The Hi-Toro project—still in its nascent stages—was about to either make or break them. Jay Miner had always been the visionary, the one who saw potential where others only saw numbers. In the bright early '80s, this was a chance for Atari to make history with a revolutionary new computer. But the doors of Atari were colder than expected, and Jay's pitch seemed to bounce off the marble walls. Atari's rejection hit harder than expected. They couldn't see the future—at least, not through Miner's eyes. The Hi-Toro, a machine crafted for the multimedia age, had been sidelined. But Jay wasn't ready to give up. Not yet. He gathered the remnants of the project and made one last desperate move: securing enough capital to circle back. At the last moment, just before the deal was done, it slipped through their fingers. Atari had no interest, and Jay Miner

“When someone gives you a cheque for half a million, you just take it!”

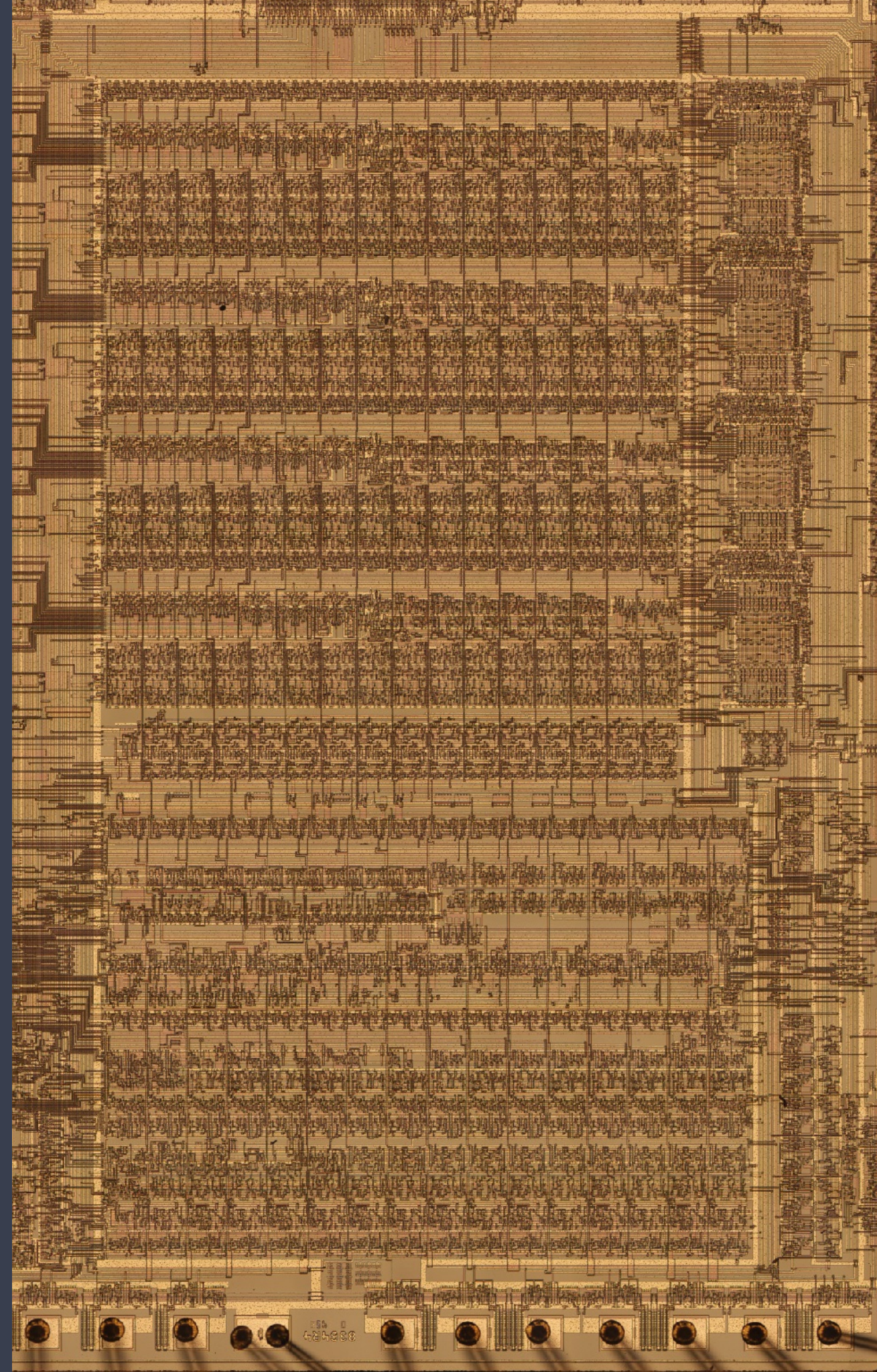
— Jack Tramiel

found himself staring into the abyss once again. But the story didn't end there. The dream wasn't dead; it simply needed a new home. The very next door they knocked on was **Commodore**, a company with a bold vision, a company willing to take risks. Within months, **Commodore** had brought in the Hi-Toro team and given the project new life. It was time for a rebrand, a fresh identity, and something that would stand out from the crowd. They called it **Amiga**—a name that echoed warmth and innovation, a name that would become synonymous with advanced multimedia technology. “Amiga” was the Spanish word for “friend,” and that was exactly what Jay and his team wanted: a machine that would be a companion to those who wanted more than just a computer. They wanted something intuitive, something that felt like it belonged to them, whether for creativity, play, or work. The **Amiga 1000** would soon take the world by storm, but this was just the beginning...

Original Chip Set

Jay Miner and the rest of the team, including R. J. Mical and Dave Needle, wanted to give the chipset of their new system friendly names, just like they did with the computer itself, after naming it *Amiga*. They were building a machine to revolutionize personal computing—one that combined powerful graphics, sound, and multitasking capabilities—and they felt the chipset should reflect that same approachable spirit. They didn't want cold, technical names; they wanted something memorable, playful, and reflective of their creation.

As they gathered to brainstorm chip names, Agnus, the memory management chip, was the first to be named. Jay Miner, involved in both the technical and creative sides of the project, suggested "Agnus" as a lighthearted reference to its role as the "Address Generator Unit." It coordinated memory access and handled the system's video and audio tasks. Jay saw the humor in giving a critical chip a calm, almost serene name, like a shepherd guiding data. The name stuck, symbolizing the chip's role in keeping everything running smoothly.



Next, they turned to the graphics chip, which would become the heart of the Amiga's visual capabilities. R. J. Mical suggested "Denise," a simple and approachable name that contrasted with the chip's powerful graphics abilities. Denise could produce high-resolution graphics and manage various color modes—features that made the Amiga stand out. The team appreciated the name's warmth, reflecting the user-friendly nature of the system while still embodying the chip's sophisticated capabilities.

For the audio chip, Paula, capable of producing four channels of high-quality sound, R. J. Mical again went with a personal, familiar name. Paula was perfect, both for the chip's friendly tone and its central role in making the Amiga's audio legendary. Whether for music, sound effects, or speech synthesis, Paula became synonymous with the Amiga's incredible sound.

The next chip, the Blitter, responsible for rapidly transferring image data, was given a straightforward name reflecting its function. The term "blit" comes from "block transfer," and the Blitter's role in moving image data quickly and efficiently made this name a natural choice. While functional, it also

carried a certain edge, highlighting the chip's power in handling complex graphics tasks.

Finally, there was the Copper chip, named after the copper wires in electronics. This chip could manipulate the screen's display in real-time during the scanline process, enabling complex visual effects. Its role was to run parallel to the video circuitry, making the name "Copper" both fitting and clever. It was a playful nod to the chip's ability to influence the video output while running alongside the main system.

As they worked through the names, it became clear that they weren't just labeling components—they were reflecting the spirit of the Amiga itself: friendly, accessible, and fun, yet powerful and revolutionary. The names *Agnus*, *Denise*, *Paula*, *Blitter*, and *Copper* weren't just technical terms; they became an integral part of the Amiga's identity and legacy. The team's creativity and sense of humor helped shape a machine that would forever change personal computing.

(Fictional depiction of how the names of the OCS were decided).

Commodore Amiga 1000

Commodore acquired Amiga Corporation in late 1984 for \$25 million, with the goal of using the Amiga's innovative technology to bolster its declining market share. Under Commodore, the Amiga team was given the resources to transition the Lorraine prototype, as the project led by Jay Miner was initially called, into a fully realized personal computer, eventually launched as the Amiga 1000.

The development process under Commodore was not without challenges. The Amiga team, now relocated to Commodore's facilities in Los Gatos, California, worked tirelessly to refine the system's hardware and software. The result was a machine that was years ahead of its time, featuring a Motorola 68000 CPU running at 7.14 MHz, 512 KB of RAM (expandable to 8 MB), and custom graphics and sound chips (Agnus, Denise, and Paula) that offered groundbreaking multimedia performance. The Amiga 1000 introduced advanced features such as 4,096 colors (HAM mode), multi-tasking capabilities, and 4-channel



stereo sound. It was the first personal computer to truly integrate multimedia functionality in a way that set it apart from competitors like the Apple Macintosh and IBM PCs.

The Amiga 1000 was officially unveiled on July 23, 1985, at a grand event at the Lincoln Center in New York City. The event featured demonstrations of the Amiga's capabilities, including stunning graphical animations, rich audio playback, and its ability to multitask. Notably, renowned artist Andy Warhol was present at the launch, where he

used the Amiga to create digital artwork, further highlighting the system's creative potential.

The media's initial impressions of the Amiga 1000 were overwhelmingly positive. Many reviewers hailed it as a revolutionary product that set a new standard for personal computing. Publications praised its graphical prowess, sound capabilities, and its ability to run complex applications simultaneously, a feature unheard of in consumer-level machines at the time. However, some reviews also noted that the machine's advanced features came with a steep learning curve, particularly for users accustomed to simpler systems.

The general public was equally impressed by the Amiga 1000's capabilities, but its adoption was hindered by several factors. For one, the Amiga 1000 launched with a high price tag of \$1,295 (equivalent to around \$3,500 today), which made it inaccessible to many home users. Additionally, Commodore's marketing efforts were criticized for failing to clearly define the Amiga's target audience - was it a business or a home computer?

Another challenge was the relative scarcity of software at launch. While the Amiga 1000 shipped with impressive demos and a handful of applications, the software

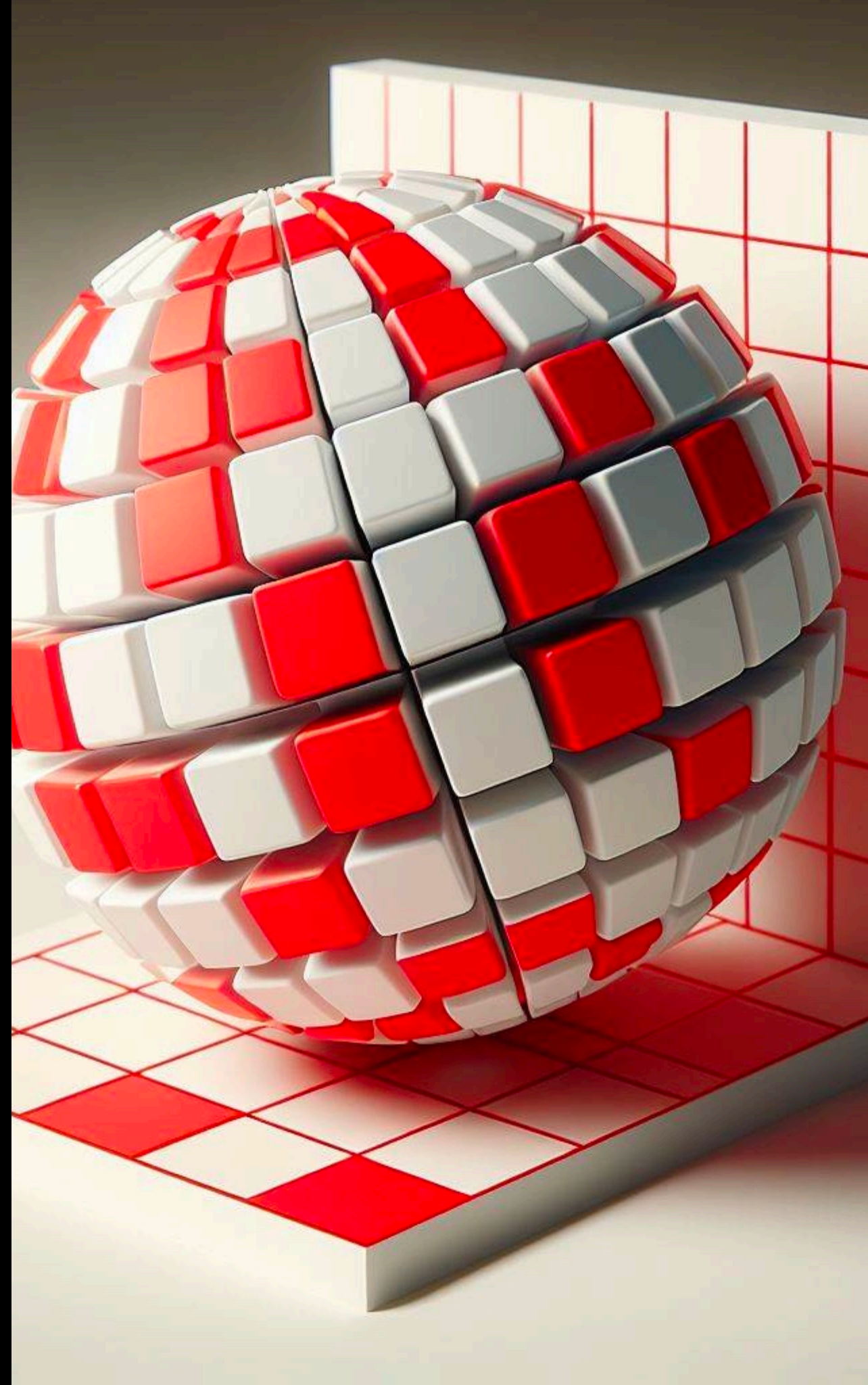
ecosystem needed time to grow. Early adopters, however, were enthusiastic about the system's potential, and developers quickly began creating a wide range of programs, including professional tools, games, and creative software.

Despite its rocky start, the Amiga 1000 established a loyal following and laid the groundwork for the success of later Amiga models, such as the Amiga 500 and Amiga 2000. It demonstrated the potential of multimedia computing, influencing the design of future systems and earning its place as a pioneering machine in computer history. Today, the Amiga 1000 is remembered as a technological marvel that was ahead of its time, showcasing the vision and creativity of Jay Miner and his team.

Characteristic	Specification
Year of Release	1985
CPU	Motorola 68000 (7.14 MHz)
Number of Colors on Screen	4096 (Hold-And-Modify)
Number of Sound Channels	4-channel stereo
Available Memory	512 KB RAM
Display Resolution (Max)	368x580 (HAM mode)

Boing!

It was late in the night... the next day, one of the most important demos of the (yet unborn) machine would take place, at a consumer show that would either make or break it. RJ Mical, one of the creators of Amiga, was pacing up and down, thinking how they could grab the attention of the crowd and show the potential of their little marvel. He sat down on the computer, along with Dale Luck, who was equally worried about making an impact and they started writing the code for a simple animation -or so they thought! This time, Jay Miner, the person who envisioned the Amiga, was not there, neither was Mitchy, their friendly dog, to offer his barking remarks. Finally, after long hours, they had a demo. They quickly run the demo, and even they were astounded by the quality and incredible smoothness: for the first time, a lowly computer could not only project an animated, bouncing 3D ball on the screen, but also do that while other tasks -including incredible stereo sound- were running on the background! This was unheard of, this was a dream come true... RJ laid back on his chair, hands on his head... all he could say was "My God, what an incredible thing we did!"



WARHOL

The Commodore team knew that the Amiga was something extremely exceptional. Nothing in the industry at the time could even come close to what it offered, at its specific price point. Nothing. Therefore, its unveiling to the public had to be special, extraordinary, magical...

The marketing department, and the Amiga team, decided to host an event at the Lincoln Center, to present the Amiga (1000) in all its glory (and in all 4096 colors!). And who else to present the unique graphical capabilities of the machine than Andy Warhol? But, there was one problem: when the time for the great unveiling arrived, the graphics program was not yet entirely there! In fact, if you used the paint bucket, the program would crash. But, the guys didn't worry: they asked Andy (Warhol) not to use that!

The day finally came, and Robert Pariseu, head of software engineering, took the stage to present the Amiga to the public. And then, he introduced Andy Warhol who took the

stage along with Deborah Harry, of Blondie. The Amiga creators were ecstatic at watching Andy use the tools to create -on stage- the portrait of Deborah. But, to their terror, they saw Andy reaching for the paint bucket tool! Cold sweat run down their face, as they expected the machine to crash. So Andy picks the paint bucket, picks a color, and then clicks on an area - and the area is filled with color! No crash, no nothing, just Andy Warhol doing his magic! Divine Intervention? Luck? Call it whatever you want, Andy gave a huge performance that showcased what the Amiga was capable of delivering!



Amstrad PCW

Alan Michael Sugar recognised a gap in the market: on one hand, people were still using bulky typewriters at work, and on the other hand, business computers with printers were still quite expensive in the mid 1980s. The Amstrad PCW (Personal Computer Wordprocessor) line, introduced in 1985, was created to address that gap in the market for affordable, dedicated word processing systems aimed at small businesses, students, and home users.

Designed primarily as a word processor, the PCW appealed to users who needed a reliable and easy-to-use machine for typing, editing, and printing documents without the additional complexity or cost of a general-purpose computer.

The first model, the Amstrad PCW 8256, featured an all-in-one design that included a monitor (with a built-in disk drive), a dedicated keyboard, and a printer, all bundled together at a price significantly lower than traditional PCs. It was powered by a Zilog Z80A processor running at 4



MHz and came with 256 KB of RAM (expandable to 512 KB). The PCW used CP/M+, a lightweight operating system, and came with Locoscript, an intuitive word processing application. This software-hardware integration ensured that users could start working right out of the box. The display was monochrome, offering a resolution of 720x256 pixels, which provided crisp and clear text. The system utilized 3-inch floppy disks for storage, the same format used by other Amstrad machines, allowing for approximately 180 KB per side.

The main benefits of the PCW line included its affordability, simplicity, and practicality for word processing tasks. By bundling the hardware, software, and even a printer into a single package, Amstrad made it accessible to users who needed an all-in-one solution without the need to purchase expensive peripherals separately. The inclusion of a printer was particularly notable, as it eliminated a significant cost barrier for users needing hard copy output. While primarily marketed as a word processor, the PCW could also run business software like spreadsheets and databases, further broadening its appeal.

The PCW line was a resounding commercial success, especially in the UK and parts of Europe. It was embraced

by small businesses, writers, and students who appreciated its no-nonsense approach to computing. By 1993, Amstrad had sold over 8 million PCW units, making it one of the most successful dedicated word processors ever produced. However, as general-purpose PCs became more affordable and versatile, the PCW line began to lose its edge. Its proprietary 3-inch disks became a drawback compared to the more common 3.5-inch and 5.25-inch formats, and the rise of GUI-based word processors on systems like the IBM PC and Macintosh further eroded its market share.

Despite these challenges, the PCW line left a lasting legacy as a machine that proved that a focused, cost-effective solution could bridge the gap between typewriters and modern personal computers for countless users.

Characteristic	Specification
Year of Release	1985
CPU	Zilog Z80A (4 MHz)
Number of Colors on Screen	Monochrome
Number of Sound Channels	None
Available Memory	256 KB RAM
Display Resolution (Max)	720x256

MSX2

The MSX2, released in 1985, was the second generation of the MSX standard, a collaborative effort led by Microsoft and ASCII Corporation to create a unified platform for home computing. MSX, which stood for "Machines with Software Exchangeability," was designed to standardize hardware and software across manufacturers, allowing for compatibility between systems produced by different companies. The goal was to compete with dominant platforms like the

Commodore 64 and ZX Spectrum and to establish a global home computer standard. Major partners in the MSX2 initiative included prominent electronics manufacturers such as Sony, Panasonic, Philips, Toshiba, Sanyo, and Yamaha, among others. These companies contributed by producing MSX2-compliant machines that adhered to the standardized specifications, ensuring a broad ecosystem of compatible hardware and software.

The MSX2 built on the success of the original MSX standard by introducing significant enhancements to graphics, sound, and memory capabilities, making it more suitable for advanced gaming and productivity tasks. It offered support for 256 colors, higher resolutions, and hardware sprite capabilities, making it competitive with systems like the Commodore 64 and early 16-bit computers. Additionally, the MSX2 supported disk drives for faster and more reliable data storage, enabling the use of more sophisticated software and games.





Reception to the MSX2 varied depending on the region. In Japan, the MSX2 was a major success, becoming a dominant home computing platform thanks to its powerful specifications and strong software library, which included games, educational tools, and productivity applications. Companies like Konami and Hudson Soft released iconic game titles for the platform, further boosting its appeal. However, in Europe and other regions, the MSX2 struggled to gain traction against established systems like the Commodore 64, Atari 8-bit computers, and the emerging IBM PC compatibles. In the United States, where MSX

adoption had already been limited, the MSX2 made little impact.

The MSX2's main benefits over its competition included its superior graphics capabilities compared to most 8-bit systems of the time, as well as its standardization, which ensured compatibility across machines and a vast software library. Additionally, it offered Yamaha's FM sound chip in some models, which provided enhanced audio quality for games and applications. However, despite these advantages, the MSX2 faced challenges due to its relatively high cost and the fragmented marketing efforts by its various manufacturers, which diluted its brand identity outside of Japan.

Characteristic	Specification
Year of Release	1985
CPU	Zilog Z80 (3.58 MHz)
Number of Colors on Screen	16
Number of Sound Channels	3
Available Memory	64 KB RAM
Display Resolution (Max)	512x212

Compaq Deskpro 386

Compaq was the first to release a computer based on the Intel 80386, an ultra-fast for its time CPU. However, the SystemPro was more a workstation -and priced accordingly- than a personal computer. Just a few months after the Compaq SystemPro was released, the Deskpro 386 was unleashed, offering the power of an 80386 processor at an affordable price. The Deskpro 386 was designed to meet the increasing demand for 32-bit processing and advanced multitasking capabilities, offering higher performance and better support for more complex applications compared to previous 16-bit systems. The Compaq Deskpro 386 offered significant advantages over its competitors, including its ability to run 32-bit applications and support for true multitasking—features that were groundbreaking for personal computers at the time. This system could handle more memory and more complex workloads, making it ideal for business environments that needed to run demanding software such as databases, spreadsheets, and



accounting programs. Additionally, the Deskpro 386's expansion capabilities were notable, supporting multiple internal drives, additional memory, and expansion cards, allowing businesses to customize the machine for their specific needs.

Characteristic	Specification
Year of Release	1986
CPU	Intel 80386 (16 MHz)
Number of Colors on Screen	16 (EGA) or 256 (VGA)
Number of Sound Channels	1
Available Memory	1 MB RAM
Display Resolution (Max)	640x480

Sinclair ZX Spectrum +2

The Sinclair ZX Spectrum +2, released in 1986, was a significant revision of the original ZX Spectrum line of home computers, which had already gained immense popularity since its debut in 1982. The ZX Spectrum +2 was developed by Amstrad, which had acquired Sinclair Research in 1986. The +2 was introduced to improve upon the original ZX Spectrum's design and functionality, addressing some of the limitations of earlier models while maintaining compatibility with the vast library of Spectrum software. One of the most notable changes in the ZX Spectrum +2 was the built-in cassette tape drive, which replaced the need for an external cassette player. This was a major convenience improvement for users, as it simplified the setup and use of the computer. The +2 also featured a new, modern design, including a more robust keyboard with a proper rubber key mechanism (as opposed to the membrane keyboard of the earlier ZX Spectrum models), making it more comfortable for extended use. Another



upgrade was the addition of more memory: while the original ZX Spectrum had been available with configurations of 16 KB or 48 KB of RAM, the Spectrum +2 was available with 128 KB of RAM, providing a more powerful and flexible platform for both gaming and other applications.

Characteristic	Specification
Year of Release	1986
CPU	Z80 (3.5 MHz)
Number of Colors on Screen	15
Number of Sound Channels	3
Available Memory	128 KB RAM
Display Resolution (Max)	256x192

Amstrad PC1512

The success of the CPC range of low-cost home computers, reassured Alan Sugar that the computer market was ready for a business machine that offered the same quality, low cost, and capable specifications. The Amstrad PC1512 was the perfect computer for the job. It was aimed at the home and small business market, designed to be an affordable alternative to the more expensive IBM PCs and compatible systems. It marked a significant shift for Amstrad, as it moved from the home computing market (with products like the ZX Spectrum) into the rapidly growing world of personal computers.

The Amstrad PC1512 was one of the first IBM PC clones that offered solid performance at a competitive price, making it a popular choice for users who wanted an affordable, PC-compatible system without having to pay the high price of IBM-branded machines. The PC1512 was well-suited for business applications, including word processing, spreadsheets, and early database

management, and it gained a foothold in both the home office and small business sectors.

The system came bundled with MS-DOS, offering compatibility with a wide range of software already available for IBM PCs. It also included a 14-inch monochrome monitor as part of the package, which was an



attractive option for businesses that required a complete system with a clear and functional display.

One of the main selling points of the Amstrad PC1512 was its affordable pricing, which was significantly lower than other IBM-compatible computers of the time. This made it an appealing choice for individuals and small businesses looking for a cost-effective entry into the world of personal computing.

The Amstrad PC1512 received a generally positive reception due to its affordable price and the fact that it provided a full-featured IBM-compatible system with a hard drive at a lower cost than other PCs. It was especially popular in the UK and European markets, where Amstrad had a strong presence and established brand loyalty from its previous success in the home computer market with products like the ZX Spectrum.

The PC1512's affordability helped make it a viable option for small businesses and home users who needed a computer for basic office tasks like word processing and spreadsheet management. However, it was somewhat



limited in terms of graphics and expandability, especially compared to other PCs available at the time. For example, its monochrome graphics were restrictive for users who needed color support for graphics-intensive applications.

The Amstrad PC1512's success helped solidify Amstrad's position in the personal computer market, and it paved the way for future IBM-compatible PCs that would further define the home and office computing space. It was also a key part of Amstrad's transition from home computing to the broader business-oriented PC market.

Characteristic	Specification
Year of Release	1986
CPU	Intel 8086 (8 MHz)
Number of Colors on Screen	Monochrome
Number of Sound Channels	1
Available Memory	512 KB
Display Resolution (Max)	320x200

Thomson TO8

The Thomson TO8, released in 1986, was part of the TO series of home computers developed by the French company Thomson SA. It was designed as a more powerful and user-friendly model compared to its predecessor, the Thomson TO7, and was targeted at both the home and educational markets. The TO8 was particularly popular in France and some parts of Europe, where it played a key role in introducing personal computing to households and schools.

The Thomson TO8 was equipped with the Zilog Z80A processor running at 3.5 MHz, which provided a solid foundation for running both educational software and games. It had 48 KB of RAM, which was relatively typical for home computers at the time, and it could be expanded to 128 KB with an external memory module. The computer supported 16-color graphics with a resolution of 320x200



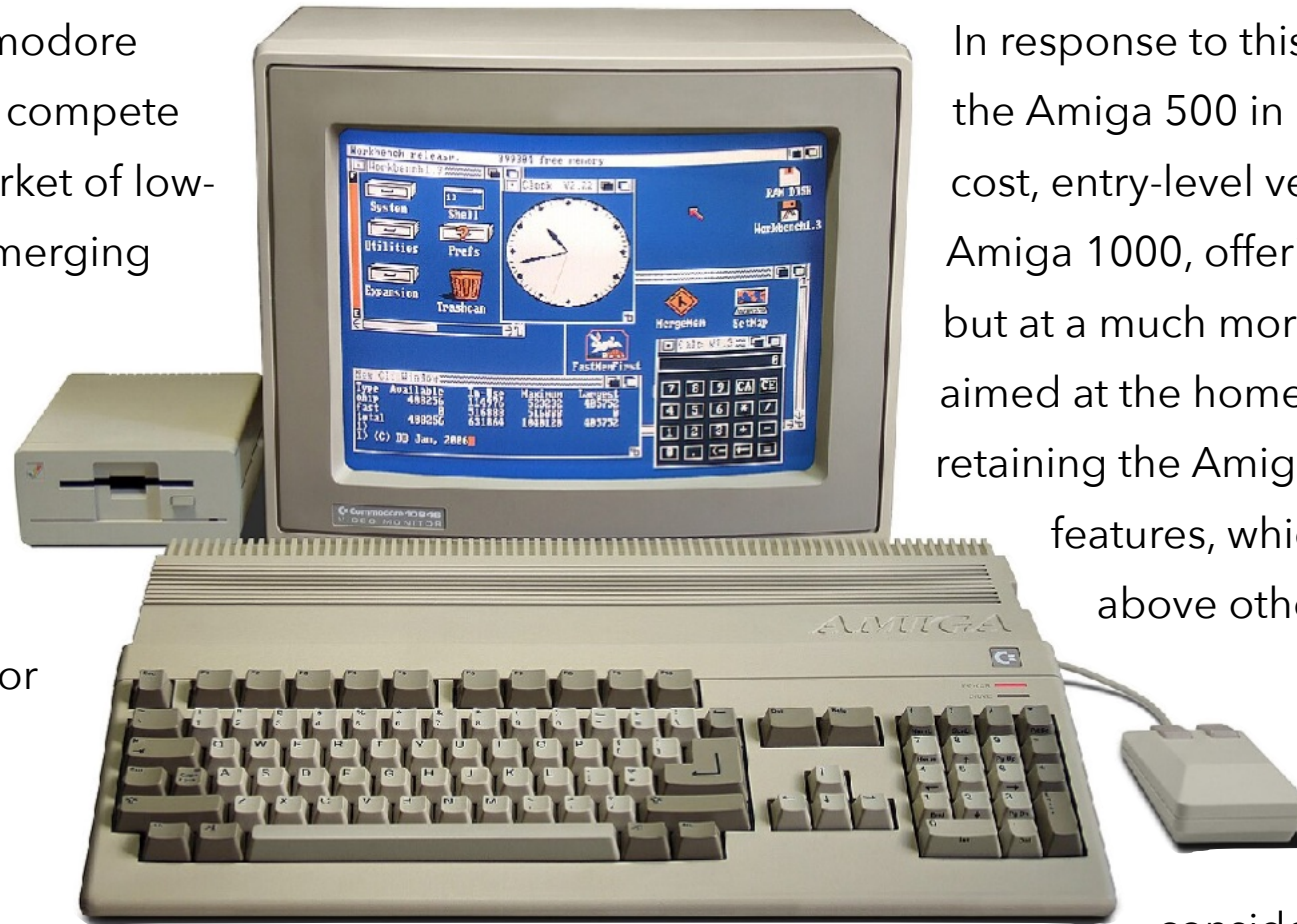
pixels or 640x200 pixels in monochrome, making it suitable for basic graphic

and text-based applications. The Thomson TO8 was generally well-received in France, where it became one of the main home computers in use for educational purposes and personal use.

Characteristic	Specification
Year of Release	1986
CPU	Zilog Z80 (3.5 MHz)
Number of Colors on Screen	16
Number of Sound Channels	3
Available Memory	48 KB RAM
Display Resolution (Max)	640x200 (Monochrome)

Commodore® **AMIGA**® 500

In the mid-1980s, Commodore recognized the need to compete against the growing market of low-cost 8-bit computers, emerging 16-bit systems, and the Atari ST. The rapid advancements in computing power and affordability presented a significant challenge for Commodore, whose popular 8-bit C64 was facing stiff competition from systems like the Atari 8-bit series and the Sinclair ZX Spectrum. At the same time, 16-bit systems, such as the Atari ST and the early Apple Macintosh, were capturing the attention of the consumer and business markets with better graphics, sound, and processing power.



In response to this shift, Commodore introduced the Amiga 500 in 1987. The Amiga 500 was a low-cost, entry-level version of the more powerful Amiga 1000, offering many of the same capabilities but at a much more affordable price point. It was aimed at the home and gaming markets while still retaining the Amiga's superior graphics and sound features, which were head and shoulders above other 16-bit systems at the time.

The Amiga 500 was powered by the Motorola 68000 processor, a 16/32-bit CPU, which was considered advanced for the time. It featured the advanced graphics and sound capabilities of the original Amiga chipset, which included the graphics coprocessor (Agnus) and the audio coprocessor (Paula). These allowed for high-quality graphics (up to 4096 colors) and stereo sound that set the Amiga apart from its

competitors, including the Atari ST, which only supported 16 colors and mono sound.

With 512 KB of RAM (expandable to 9 MB), the Amiga 500 was positioned as a versatile machine capable of running not only games but also productivity applications, making it appealing for both entertainment and light business use. Its advanced multitasking operating system, Workbench, made it a unique offering, providing a graphical user interface that was more sophisticated than what was available on many contemporaneous systems.

Despite its low price, the Amiga 500 retained the same flexibility for expansion that the original Amiga models offered. Users could add external floppy drives, hard drives, RAM expansions, and other peripherals. The machine's video output was capable of impressive resolutions and a palette of colors far surpassing that of the Atari ST and the Commodore 64,



solidifying the Amiga 500 as a powerful multimedia system.

The success of the Amiga 500 was significant in that it allowed Commodore to capture a large share of the home computer market, challenging the dominance of IBM PC compatibles, Atari ST, and even the Macintosh. The Amiga 500 became a cult classic in the gaming community, and many of the popular games of the era were developed specifically for it. However, despite its technological superiority, the Amiga series suffered from marketing and distribution issues, leading to its eventual decline in market share. Nonetheless, the Amiga 500 remains an iconic machine in the history of personal computing and gaming.

Characteristic	Specification
Year of Release	1987
CPU	Motorola 68000 (7.16 MHz)
Number of Colors on Screen	4096 (Hold-and-modify mode)
Number of Sound Channels	4
Available Memory	512 KB RAM
Display Resolution (Max)	640x512

Commodore Amiga 2000

The Amiga 1000 was a ground-breaking machine. However, it was targeted as a machine for home and entertainment, a main weakness for a machine of its incredible strengths. Commodore, wisely, decided to create two machines, to tackle the needs of both the professional market and the home and entertainment. Therefore, it decided to create a machine for business and multimedia, the Amiga 2000, and a home computer, the Amiga 500.

The Amiga 2000 was developed by Commodore International, with engineers who had been involved in the development of the earlier Amiga models. The primary goal was to create a more powerful, expandable version of the Amiga 1000 to meet the needs of professional users who required more processing power and hardware flexibility. This shift in focus was partly due to the increasing demand for computers capable of handling advanced graphics, video editing, and other multimedia tasks that were beyond the capabilities of many contemporary PCs.

Whereas the Amiga 1000 used what is now called "OCS" (the Original Chip Set), the Amiga 2000 used an upgraded version, including the ECS (Enhanced Chip Set) or AA (Advanced Amiga) Chipset, which introduced improved graphics and sound capabilities. The Agnus was replaced with Fat Agnus to support up to 2 MB of Chip RAM instead of 512 KB, and the Denise chip was upgraded to Super Denise, providing better resolution and color depth.



The Amiga 2000 also featured the 68000 CPU, but with improvements in the system's architecture. The base model included 1 MB of RAM, expandable to 6 MB (or more with third-party upgrades), and it allowed for greater use of fast RAM, which was separate from the Chip RAM used for graphics and audio.

One of the greatest benefits of the Amiga 2000 over the 1000, was its expandability. It was designed to be much more expandable, with a modular design that allowed for the addition of more RAM, specialized graphics and sound cards, external storage devices, and even a SCSI interface for better connectivity with professional peripherals. It featured 5 expansion slots, making it suitable for users with professional needs like video production or computer-aided design (CAD).

The Amiga 2000 was generally well-received in the professional market due to its expandability, powerful graphics, and audio capabilities. It helped cement the Amiga's reputation as a multimedia powerhouse, although

it never achieved the mainstream success of some other computers due to its relatively high price and niche focus. The Amiga 1000, on the other hand, garnered attention for its innovative design and multimedia features but was overshadowed by more affordable systems in the

consumer market. Both systems, however, established the foundation for the continued development of the Amiga line, which would eventually lead to more powerful machines like the Amiga 3000 and Amiga 4000.



Characteristic	Specification
Year of Release	1987
CPU	Motorola 68000 (7.16 MHz)
Number of Colors on Screen	4096 (Hold-and-modify mode)
Number of Sound Channels	4
Available Memory	1 MB RAM
Display Resolution (Max)	640x256

ACORN RISC MACHINE

Acorn was resolute: they needed to design a CPU that could run on less than 1 watt of power. It was an ambitious goal, but the tools at their disposal were rudimentary and unreliable. Despite these challenges, the engineering team, led by **Sophie Wilson** and **Steve Furber**, worked tirelessly, constantly refining their designs. They knew their latest line of computers could be their last chance to make a mark, so they switched to a more promising architecture—one that embraced a reduced instruction set and offered the potential for unprecedented performance in a "home" computer. Then, the day arrived. The first batch of processors was ready for testing. With bated breath, they attached one to the motherboard and powered it up. To their delight, the CPU worked flawlessly. But then something unexpected happened: the motherboard wasn't receiving any power. After investigation, they discovered the CPU was running entirely on residual energy from the other components!

In that moment, they unknowingly created an incredibly power-efficient 32-bit processor—an innovation that would



revolutionize the tech world. What started as an accident became the foundation for ARM architecture, used in everything from smartphones to embedded systems. That was their true "EUREKA" moment—a small spark that ignited a technological revolution.

Acorn Archimedes

Acorn realized that the competition was intensifying, and soon its existing computers would be rendered obsolete, unable to compete with the rising tide of IBM-compatible machines or companies like Atari and Commodore. In response, Acorn developed the ARM (Acorn RISC Machine) processor, which exceeded even its own expectations. With this revolutionary chip, Acorn introduced the Archimedes in 1987, a personal computer that would change the landscape of computing.

The Archimedes was powered by the ARM processor, a 32-bit Reduced Instruction Set Computing (RISC) chip that provided exceptional processing power with minimal energy consumption. Unlike traditional Complex Instruction Set Computing (CISC) processors, RISC's simpler instruction set allowed the ARM chip to deliver faster performance while being far more efficient. This technology would later become the foundation for modern



mobile computing, powering everything from smartphones to tablets.

At the heart of the Archimedes was RISC OS, a pioneering operating system that showcased the true potential of the ARM processor. One of its standout features was preemptive multitasking, which allowed the operating system to manage multiple tasks simultaneously without one process monopolizing the CPU. This was a significant leap forward from the cooperative multitasking found in many systems of the time. With preemptive multitasking,

users could run applications concurrently, switching between them with ease, while the system efficiently allocated resources to ensure smooth operation.

RISC OS also featured an intuitive graphical user interface (GUI) that made it accessible to users, even those without prior technical knowledge. Its icon-based design, where objects like files, folders, and applications were represented as clickable icons, made navigation simple. The interface supported drag-and-drop functionality, allowing users to move files between folders, open applications, or print documents with just a click and drag. RISC OS was one of the first operating systems to embrace this GUI approach, which would later become standard across personal computing.

The graphics capabilities of the Archimedes were another key highlight. Driven by its dedicated Video Display Processor (VDP), the Archimedes could output resolutions up to 640x480 in 256 colors, and in higher resolutions, it could display up to 16.8 million colors. This made the Archimedes an excellent platform for creative tasks such as graphic design and video production. The system's powerful graphics, coupled with RISC OS's multitasking abilities, made it an ideal choice for multimedia applications.

While the Archimedes didn't achieve the commercial success that its innovations deserved, its legacy is undeniable. The ARM processor, which started as the core of the Archimedes, would go on to dominate the mobile computing industry, found in virtually every smartphone and tablet today. The influence of RISC OS can also be seen in modern operating systems, especially in terms of multitasking and GUI design.

Even today, the Archimedes remains a revolutionary machine, that managed to combine the groundbreaking power of the ARM processor with the efficiency and elegance of RISC OS. It set new standards in computing, offering a level of performance and usability that was ahead of its time.

Characteristic	Specification
Year of Release	1987
CPU	Acorn RISC Machine
Number of Colors on Screen	4096
Number of Sound Channels	4
Available Memory	512 KB RAM
Display Resolution (Max)	640x480

Sinclair PC200

After Alan Sugar's acquisition of Sinclair Research in 1986, the acquisition of a rival company with a history of innovation was meant to further extend Amstrad's reach into the personal computer market. Sinclair had previously been known for the ZX Spectrum, one of the most successful home computers of the 1980s, but by the mid-80s, the market was shifting, and Amstrad had plans to modernize Sinclair's product line. However, one of the first products released following this acquisition, the Sinclair PC200, became an



infamous example of a failed product in the personal computer market.

The Sinclair PC200, launched in 1986, was intended to tap into the emerging market for personal computers that could function as business machines.

However, it was widely seen as an underwhelming

attempt to bring Sinclair into the world of IBM-compatible PCs.

The PC200 was supposed to be an affordable entry-level machine, but its design decisions were questionable from the start. The computer was built around a 8088 processor, which was already outdated compared to its contemporaries. The decision to use this chip, which was

considered too slow for a modern personal computer, immediately put the PC200 at a disadvantage.

One of the PC200’s biggest design flaws was the low-quality display, which was limited to CGA graphics. By the time of its release, this graphic standard was already being surpassed by better displays such as EGA and VGA. Additionally, the computer was poorly equipped for multitasking and had limited capabilities for running more demanding applications, which further reduced its appeal to the business market it was targeting.

Amstrad, under Alan Sugar’s leadership, had intended to target the rapidly growing personal computer market for small businesses and home use. They tried to offer a cheap alternative to IBM PCs, but the resulting product fell short. The PC200 also used an underpowered 4 MHz clock speed, which severely hindered its ability to run software efficiently.

The Sinclair PC200’s reception was largely negative. It was widely criticized for being a subpar product compared to others in its category. The primary issue was that it was trying to compete with the IBM PC-compatible machines, which by that time had already become the standard for business and home computing. The IBM-compatible

market was dominated by systems with better specifications, including faster processors, higher-quality graphics, and more robust hardware overall.

The Sinclair PC200’s price of £399 made it more expensive than its competitors in the same category, yet it didn’t deliver a significantly better experience. As a result, it failed to gain traction in the market. Many consumers and businesses quickly turned to Amstrad’s PC1512, released shortly after the PC200, which offered much better performance, better compatibility with IBM PC software, and superior graphics.

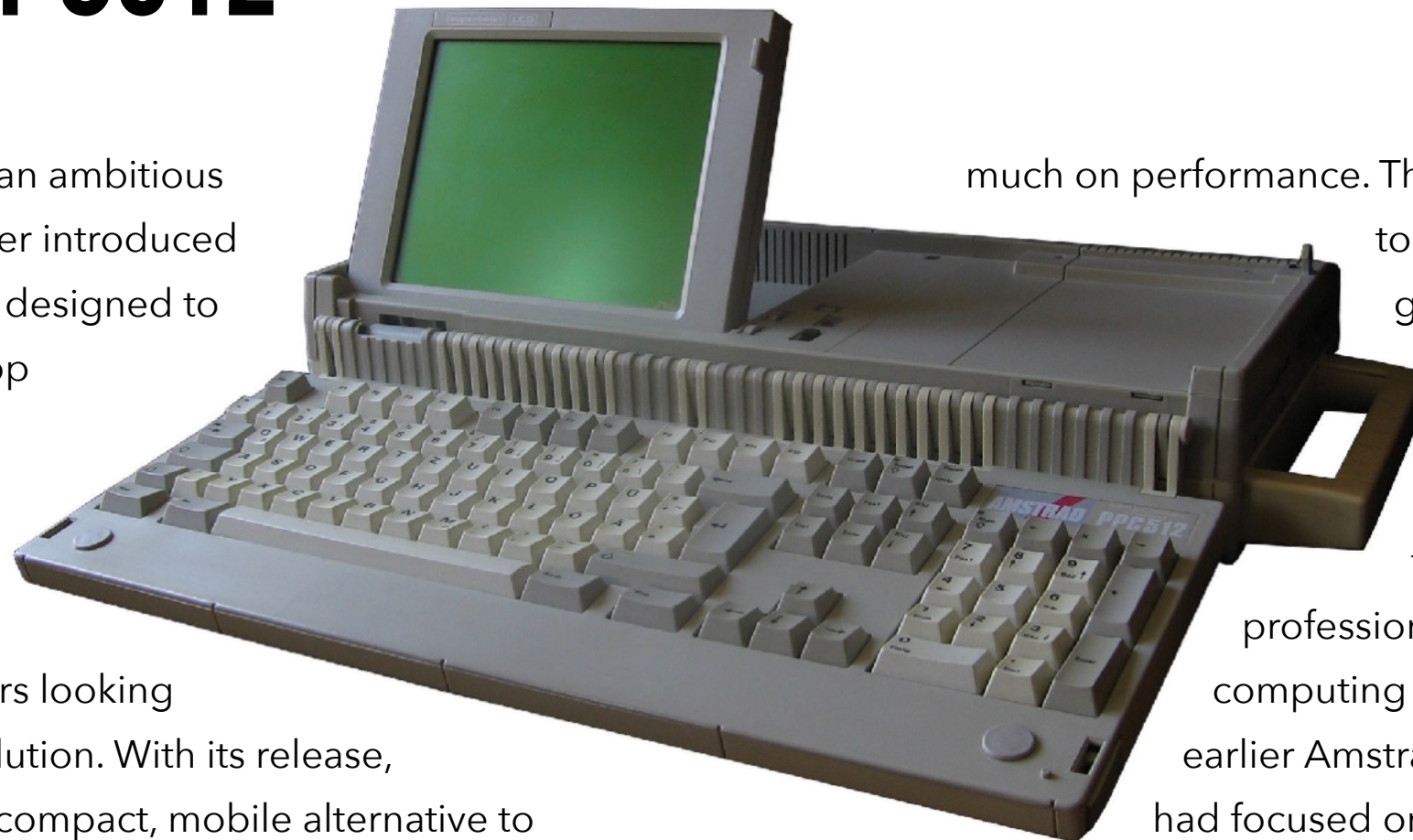
Despite its poor reception, the Sinclair PC200 is remembered as a cautionary tale of misjudging market demands and the importance of technology parity.

Characteristic	Specification
Year of Release	1988
CPU	Intel 8086 (4 MHz)
Number of Colors on Screen	4
Number of Sound Channels	1
Available Memory	128 KB RAM
Display Resolution (Max)	320x200

Amstrad PPC512

The Amstrad PPC512 was an ambitious portable personal computer introduced by Amstrad in 1988. It was designed to fill a niche between desktop computers and portable laptops, providing a more affordable option for business users, small companies, and home users looking for a simple computing solution. With its release, Amstrad sought to offer a compact, mobile alternative to more expensive systems like IBM's portable PCs or Toshiba's early laptops.

The PPC512 was developed during a time when the demand for portable computers was increasing, but many machines were still bulky and expensive. Recognizing this, Amstrad aimed to create a portable solution that was accessible to a wider audience without compromising too



much on performance. This was an attempt to compete with the growing market for IBM PC-compatible laptops, targeting both professional and home computing needs. Unlike earlier Amstrad products, which had focused on home computing, the PPC512 was designed with an eye toward the business market. It offered a portable alternative to more expensive desktop computers, featuring a built-in 3.5-inch floppy drive, MS-DOS compatibility, and an integrated monochrome LCD screen.

One of the key features of the PPC512 was its use of the NEC V30 processor, running at 8 MHz. The NEC V30 was a

clone of the Intel 8086, offering improved efficiency and compatibility, which made it a better choice for the PPC512. This allowed the system to run many MS-DOS-based business applications without excessive lag. The system also featured 512 KB of RAM (expandable), providing enough memory for most office tasks. It ran on MS-DOS 2.11, which made it fully compatible with the software available for IBM PCs, including popular applications like word processors and spreadsheets.

In addition to its processor and memory, the PPC512 featured an integrated 3.5-inch floppy disk drive with a storage capacity of 720 KB, eliminating the need for external peripherals. This made the machine more portable and user-friendly. The system relied on 10 C-Cell batteries, since it did not have an internal rechargeable one, which made its use as a portable machine away from a power outlet costly. The PPC512 was also relatively compact and lightweight, weighing around 3.5 kg (7.7 lbs), which made it one of the more portable personal computers available at the time.



The Amstrad PPC512 received mixed but generally positive reviews upon its release. It was praised for being affordable, portable, and offering MS-DOS compatibility at a time when other portable PCs were considerably more expensive. Its design and features made it a useful option for home users and small businesses who did not require high-end performance but needed a reliable and transportable solution for everyday computing tasks. However, the PPC512 did face criticisms related to its performance and display quality. The NEC V30 processor, while efficient, was still relatively slow by the standards of some of its competitors.

Characteristic	Specification
Year of Release	1988
CPU	NEC V30 (8 MHz)
Number of Colors on Screen	Monochrome
Number of Sound Channels	1
Available Memory	512 KB RAM
Display Resolution (Max)	-

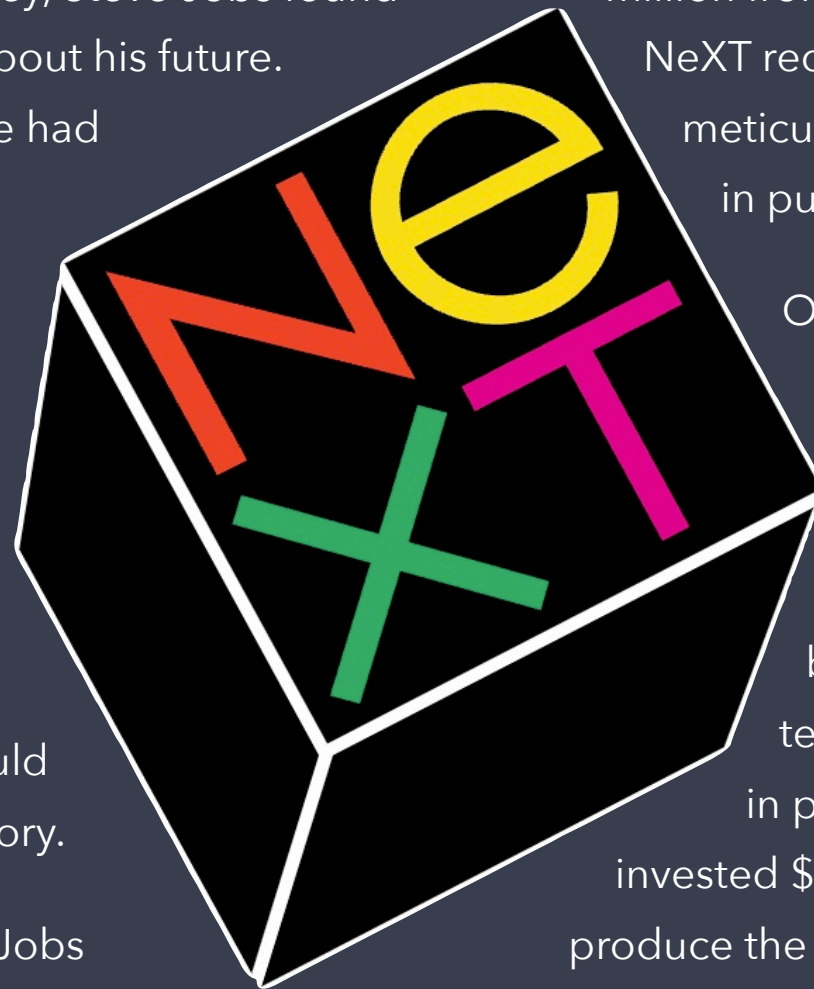
The NeXT step of Steve Jobs

After being ousted from Apple in 1985 following an unsuccessful coup against John Sculley, Steve Jobs found himself disillusioned and uncertain about his future.

Losing his position at the company he had founded was a bitter blow, but it ignited a new determination. Jobs resolved to create the Next Big Thing: a machine that could rival—and surpass—the Macintosh, his greatest achievement at the time. This marked the beginning of NeXT, a company that, while not achieving widespread commercial success, would change the course of computing history.

Following his departure from Apple, Jobs spent time contemplating his next move before forming NeXT. The company's goal was to build a high-performance workstation for higher education and creative professionals. This machine would be more advanced, designed for users needing power and flexibility. To finance

NeXT, Jobs invested much of his own money, securing \$7 million from various investors. However, his vision for NeXT required more than funding—it demanded meticulous attention to detail, and Jobs was relentless in pursuing perfection.



One of Jobs' first priorities was defining the NeXT brand. Recognizing the importance of a strong logo, he hired renowned designer Paul Rand, paying \$100,000 for a minimalist, modern design. The bold, block-style logo became a symbol of the cutting-edge technology Jobs aimed to deliver. With branding in place, Jobs turned to manufacturing. He invested \$15 million in a state-of-the-art factory to produce the NeXT Computer, a massive expense for a startup. This high-end facility reflected Jobs' commitment to creating a next-generation machine built to the highest standards, capable of competing with the biggest names in computing.

NeXT Computer

Steve Jobs left Apple at a low point, barely in his thirties, a millionaire, yet ousted from the company he had founded. He had lost control of the Macintosh—the groundbreaking machine he helped create—and feared being remembered as a “has been.” Determined to make a bold comeback, Jobs devised a brilliant plan to build a new, revolutionary machine and bet everything on the NeXT Computer.

The NeXT Computer, often called the NeXTcube, was the first machine developed by NeXT Inc., the company Jobs founded after leaving Apple in 1985. Released in 1988, it aimed to transform computing with advanced hardware and software.



Designed for academics, researchers, and professionals, the NeXT Computer was a blend of cutting-edge technology and sleek design, standing out as both a technical and aesthetic marvel.

Jobs led the development process with a hands-on approach, collaborating with a talented team, including Avie Tevanian, the chief architect of the NeXTSTEP operating system, and contributors like Joanna Hoffman and Dan'l Lewin. His relentless push for innovation resulted in a premium machine but also drove up costs. For instance, his choice to include a magneto-optical drive instead of a traditional floppy disk was forward-thinking but ultimately impractical due to the drive's high cost and slow

performance.

The hardware was cutting-edge for its time, featuring a Motorola 68030 processor running at 25 MHz and a 68882 floating-point coprocessor for advanced calculations. With 8 MB of RAM, expandable to 64 MB, and a 256 MB magneto-optical drive for storage, it was extraordinary for the era. Its 1120x832 resolution grayscale display delivered crisp visuals, while its built-in DSP (Digital Signal Processor) enabled advanced audio functions like speech synthesis. Encased in a sleek black magnesium cube, the NeXT Computer reflected Jobs’ obsession with both function and form.

The NeXT Computer’s standout feature was its NeXTSTEP operating system, which combined a Unix-based microkernel (Mach) and BSD Unix with an intuitive graphical interface. It introduced object-oriented programming through Objective-C and offered innovative development tools like Interface Builder, allowing developers to create graphical applications via drag-and-drop. These tools paved the way for significant software innovations, including the World Wide Web, as Tim Berners-Lee used a NeXT machine to develop the first browser.

The machine introduced groundbreaking features like durable storage via its magneto-optical drive (albeit slow), built-in Ethernet and TCP/IP networking, and advanced audio processing. Its high-resolution display and robust development environment made it ideal for its target audience: academics, researchers, and software developers.

Though it was not a commercial success, the NeXT Computer left a lasting legacy. Its NeXTSTEP operating system became the foundation for macOS and iOS after Apple acquired NeXT in 1996, bringing Jobs back to the company. The NeXT Computer's influence on modern computing remains undeniable, with its innovations shaping technology for decades to come.

Characteristic	Specification
Year of Release	1988
CPU	Motorola 68030 (25 MHz)
Number of Colors on Screen	Monochrome
Number of Sound Channels	2
Available Memory	8 MB RAM
Display Resolution (Max)	1120x832

Apple Macintosh Portable

The Macintosh, under the leadership of Steve Jobs, was always intended as a machine that could be easily transported from one place to the next. That is the main reason why Apple included a carrying handle in the case of the machine, and Steve Jobs, in its first presentation, even demonstrated the machine coming out of a carrying bag.

However, it was only in 1989 that Apple managed to release a true portable computer, after overcoming challenges like integrating a high-quality screen, great battery life and an ingenious tracking device - a trackball - for using the highly-acclaimed GUI of the Mac.



Technically, the Macintosh Portable was ahead of its time in many ways. It featured a Motorola 68000 processor running at 16 MHz, which was comparable to desktop Macs and outpaced many competing portable computers. The device came with 1 MB of RAM, expandable up to 9 MB, and included a 3.5-inch floppy drive alongside an optional 40 MB hard drive. Its standout feature was its 9.8-inch active-matrix LCD display, which offered crisp black-and-white graphics far superior to the passive-matrix screens found in most competitors' laptops.

The Macintosh Portable was powered by a lead-acid battery, which provided an impressive runtime of 8-10

hours. However, the battery significantly added to the device's weight, making it less practical as a portable device. Moreover, a design flaw meant the Portable would not operate without a working battery, even when connected to an AC power source. This limitation became a major issue for users. The device also featured a built-in trackball for cursor control, which could be repositioned to either side of the keyboard, showcasing Apple's attention to user experience.

However, these features came at a cost, both in terms of price and weight. With a weight of more than 7 Kg, the machine was much heavier than competing laptops from other manufacturers, such as the Toshiba T1000, not to mention the much higher price. This made the Macintosh Portable a machine for high-end professionals who needed a machine they could carry with them, placing it outside the reach of most consumers.

Although the Macintosh Portable was a commercial failure, it laid the groundwork for future innovations in portable computing. Apple learned valuable lessons from the Portable's shortcomings, which directly influenced the design of the PowerBook series introduced in 1991. The PowerBooks addressed the Portable's flaws with a sleeker,

lighter design and a more competitive price point, ultimately becoming a template for modern laptops.

The Macintosh Portable remains an important part of computing history. While it was a bold and ambitious product, its high cost, heavy design, and technical limitations made it impractical for most users. Today, it is a sought-after collector's item and a reminder of Apple's early attempts to redefine portable computing.



Characteristic	Specification
Year of Release	1989
CPU	Motorola 68000 (16 MHz)
Number of Colors on Screen	Monochrome
Number of Sound Channels	1
Available Memory	1 MB RAM
Display Resolution (Max)	640x400

Atari STacy

The Atari ST line of computers was met with great success by musicians, since it was the first computer that had MIDI (Musical Instruments, Digital Interface) ports built-in as standard, and enough processing power (and a GUI) to run user-friendly yet powerful music software.

Musicians, however, always asked Atari to produce a computer they could easily take on the road. Atari, in 1989, produced such a machine, that was easy to transport, even though it was still very bulky (at almost 7 Kg) to carry around as a general-purpose machine.

The STacy was powered by a **Motorola 68000 CPU** running at **8 MHz** and came with **1 MB, 2 MB, or 4 MB of RAM**, depending on the model. Its storage included a built-in **3.5-inch floppy disk drive**, but it lacked a hard drive in its base configuration, though users could add one externally. It featured a **10-inch monochrome LCD screen**, offering high-resolution graphics suitable for professional applications, though its monochrome nature made it less

appealing for gaming or color-dependent tasks. The system ran on Atari's **TOS (The Operating System)**, which was user-friendly and popular among creative users.

While portable, the STacy's size and weight limited its practicality as a laptop. Its reliance on **internal lead-acid batteries** for power provided only a few hours of runtime, and some models required external AC power for prolonged use. Despite these limitations, the STacy was one of the first portable computers tailored to musicians

Characteristic	Specification
Year of Release	1989
CPU	Motorola 68000 (8 MHz)
Number of Colors on Screen	-
Number of Sound Channels	-
Available Memory	1 MB RAM
Display Resolution (Max)	-

Atari STacy

The Atari STacy, released in 1989, was Atari's response to musicians' demands for a portable version of the popular ST line of computers. The ST series had gained widespread success among musicians due to its built-in MIDI (Musical Instrument Digital Interface) ports, powerful performance, and user-friendly graphical interface for running music software.

Powered by a Motorola 68000 CPU running at 8 MHz, the STacy came with 1 MB, 2 MB, or 4 MB of RAM, depending on the model. It featured a 3.5-inch floppy disk drive for storage, with optional external hard drives. The 10-inch monochrome LCD screen provided high-resolution graphics ideal for professional applications, though its monochrome nature limited its appeal for gaming or tasks requiring color.



While portable, the STacy's weight and reliance on internal lead-acid batteries limited its practicality, offering only a few hours of runtime. Its high price—ranging from \$2,500 to \$4,500—and competition from smaller, lighter laptops in the late 1980s further hindered its success. However, it was the first portable computer designed for musicians!

Characteristic	Specification
Year of Release	1989
CPU	Motorola 68000 (8 MHz)
Number of Colors on Screen	Monochrome
Number of Sound Channels	3
Available Memory	1 MB RAM
Display Resolution (Max)	640x400

SAM Coupé

By the end of the 1980s, the Sinclair Spectrum range had been outpaced by the more advanced 16-bit computers from Commodore and Atari. However, the Spectrum's enduring popularity and loyal fanbase inspired Miles Gordon Technology in the UK to create a new 8-bit computer that could not only run the vast Spectrum software library but also compete with the emerging 16-bit systems like the Atari ST and Commodore Amiga. This resulted in the creation of the SAM Coupé.

Built around a Zilog Z80 CPU running at 6 MHz, the SAM Coupé featured 128 KB of RAM, expandable to 512 KB, and offered impressive graphics for its time, including a 256-color palette and high-resolution capabilities, making it ideal for gaming and multimedia applications. It also came with an integrated 3.5-inch floppy disk drive. Despite its technical merits, the SAM Coupé faced stiff competition from more established machines, limiting its commercial success.



Nonetheless, the SAM Coupé is still regarded as a remarkable achievement for its time, praised for its design and technical capabilities, and continues to be admired today, as one of the last attempts at a personal 8-bit computer.

Characteristic	Specification
Year of Release	1989
CPU	Z80B (6 MHz)
Number of Colors on Screen	16
Number of Sound Channels	6
Available Memory	256 KB RAM
Display Resolution (Max)	512x192

Acorn Archimedes 3000

The Acorn Archimedes A3000, released in 1989, was developed as a response to the dominance of the Atari ST and Commodore Amiga in the low-cost computer market. Positioned as a successor to the popular BBC Micro series, the A3000 aimed to blend advanced performance with affordability, targeting educational and home computing audiences. It was part of the Archimedes line, first introduced in 1987, which showcased high-performance

systems powered by Acorn's innovative RISC-based architecture. The A3000 was designed to solidify Acorn's presence in the low-end market by offering a compact, cost-effective version of its cutting-edge hardware.

The A3000 featured an all-in-one design that integrated the keyboard and a built-in 3½-inch floppy disk drive. Inside, it utilized a 32-bit ARM (Acorn RISC Machine)

processor running at 8 MHz, capable of delivering approximately 4 MIPS (million instructions per second). Acorn complemented the processor with custom chips, including the VIDC (Arabella) for video and audio processing, the MEMC (Anna) for memory management, and the IOC (Albion) for system bus and peripheral communication. The



A3000 supported resolutions up to 1152x896 pixels and could display up to 256 colors simultaneously from a palette of 4096. Its audio capabilities included eight stereo sound channels with sampling rates up to 32 kHz, offering clear and dynamic sound. Games designed for the A3000 had incredibly fluid animation, and the early 3D games were some of the most impressive, since the A3000 offered huge performance gains over both the Atari ST and the Commodore Amiga 500.

Running on RISC OS, a multitasking, WIMP-based operating system, the A3000 provided a user-friendly interface with tools like Draw, Paint, and Edit for creating graphics, editing text, and more. This system made the A3000 versatile and accessible for users, especially in educational settings. The hardware was designed with expandability in mind, featuring an accessible motherboard and an expansion slot for add-ons like hard drives and video capture cards. The design also included practical touches, such as a mouse port located beneath the case to reduce desk clutter.

Despite its impressive specifications and strong focus on education, the A3000 faced challenges in broader adoption. Limited third-party software and a relatively high

price point compared to competitors like the Atari ST and Commodore Amiga hindered its market success. Nonetheless, the A3000 remains a significant milestone in computer history, showcasing Acorn's pioneering use of RISC technology, which would later influence modern computing architectures.



Characteristic	Specification
Year of Release	1989
CPU	ARM2 (8 MHz)
Number of Colors on Screen	256
Number of Sound Channels	4
Available Memory	1 MB RAM
Display Resolution (Max)	1056x256

In this chapter...

Chapter 7 explored one of the most innovative eras in the history of home computers—a time when numerous companies introduced entirely unique machines, each running its own software and offering groundbreaking features that set them apart from the competition. This period saw the release of some of the most promising computers, as 16-bit systems dominated the second half of the 1980s, while the first 32-bit computers began making their debut and hinting at the future of personal computing.

However, the booming industry of this golden age would soon face a dramatic decline. By the early to mid-1990s, most of the pioneering companies had gone out of business, leaving behind a market dominated by IBM-compatible systems (eventually known simply as "PCs") and the Macintosh, which retained only a small share of the market. Companies like Sinclair, Amstrad, Commodore, and Atari were the shining stars of the 1980s, but their brilliance would soon dim as the industry consolidated and competition intensified.



• 8 •

War of the Console!

"A delayed game is eventually good, but a rushed game is forever bad."

(Attributed to Shigeru Miyamoto)

Introduction

The United States had the largest market for video games, but the industry was left in disarray after the video game crash. With almost every publisher affected and retailers steering clear of game consoles, Nintendo recognized a golden opportunity to break into the market. However, they understood that success required avoiding the mistakes that had doomed other companies in the past.

Nintendo's strategic entry into the U.S. market with their Entertainment System not only revitalized the gaming industry but also set the stage for other companies to follow suit, including SEGA—and later, Sony. This sparked a new era of competition, famously dubbed the "console war," as a wave of sophisticated machines like the NES, SNES, Mega Drive, Atari Lynx, Game Gear, and Game Boy battled for the attention and wallets of players worldwide.

During this period, Nintendo cemented its place as a household name, captivating gamers across the globe. Yet, their success also laid the groundwork for Sony's eventual entry and dominance in the market, reshaping the future of video gaming.



A broken industry

The video game industry was devastated, immediately after the 1983 crash, taking with it several hardware vendors and more than a few video game development companies. The crash, caused by factors such as market oversaturation, poor-quality games, and the rise of home computer gaming, led to a dramatic collapse in the North American video game market.

In the United States, the industry's decline was marked by the fall of key players, including the Atari 2600, which had been a dominant force in the gaming market. By 1983, the video game market in the US was estimated to have been worth approximately \$3.2 billion, but following the crash, revenues plummeted. By 1985, the U.S. video game market had fallen to around \$100 million, a staggering drop of nearly 97% in just two years. Many video game companies went bankrupt or significantly scaled down their operations, including Atari,



which faced severe financial losses. Consumer trust in video games had also been severely damaged, as many titles were perceived as low-quality and rushed to market. After its Atari 2600 and later consoles faced a major decline in sales, compounded by poor-quality games and the company's mismanagement, Atari was sold to the Warner Communications in 1984, and the brand struggled to regain its former glory. The collapse of Atari had a ripple effect on other companies in the market. In addition to Atari, companies like Magnavox, which had produced the Odyssey consoles, also faced severe losses. Magnavox was one of the first major console manufacturers, but its failure to adapt to the changing market, coupled with the oversaturation of consoles and

the collapse of consumer confidence, led to its retreat from the video game hardware market by the mid-1980s. Similarly, the console division of Mattel, which had produced the Intellivision, also suffered during this period and ultimately exited the gaming hardware market.

Other notable casualties included smaller companies like the GCE (General Consumer Electronics), which manufactured the Vectrex console. The Vectrex was a unique console featuring a built-in vector monitor, but its high production costs and the crash's impact caused the company to cease production of the system. The crash also had a devastating effect on third-party game developers and publishers who had flooded the market with low-quality titles. Many of these companies went out of business, while others restructured or refocused their efforts on more lucrative markets.

The personal computer market also experienced similar turmoil, with several companies struggling to survive. Tandy, a major producer of the TRS-80, faced significant losses, as did companies like Commodore, which saw its sales of the Commodore 64 drop sharply, although the brand would later recover due to its later product lines. Meanwhile, companies like the British home computer

manufacturer Sinclair Research, best known for the ZX Spectrum, also faced financial difficulties as a result of the market's collapse.

Globally, the impact of the crash was not as severe in every region. In Japan, for example, the gaming market was more stable due to the continued success of Nintendo's home console, the Nintendo Famicom (it will be renamed Nintendo Entertainment System, or NES in the US and Europe), which was initially released in Japan in 1983 (image middle). The NES, as we will see in the next pages, played a critical role in the revival of the video game industry, helping to restore consumer confidence with its quality games and the establishment of stringent third-party publishing standards. In Europe, the gaming market also faced some challenges, but the impact of the crash was less pronounced compared to the U.S..

Despite the challenges faced in the early 1980s, the industry began to recover by the mid-1980s, thanks in part to the success of the NES and a revitalized video game development culture. By the late 1980s, the video game market was growing again, with the introduction of new consoles by Nintendo and SEGA.

Limiting Developers

Nintendo knew very well that oversaturation of the video games market, along with very bad quality video games, was one of the main reasons of the 1983 crash. They understood, at the same time, that tightly controlling the development process, including the number and the quality of games, would greatly displease developers, but it would also mean that they rectified one of the main issues the market had faced in the past. That is why Nintendo implemented tight control over third-party developers. The company limited the number of games a third-party developer could release per year on the NES, restricting developers to no more than five titles annually. This was a strategic move designed to maintain a high standard of quality and prevent the market from becoming oversaturated with poor games, which had contributed to the crash.

Nintendo also required developers to sign a licensing agreement, which meant that only licensed developers could produce games for the NES. This allowed Nintendo to keep tight control over which games were available on the system and ensured that each game met a certain standard of

quality. The company's approval process for games became one of its signature strategies to safeguard the reputation of the NES. This approach was critical in restoring consumer confidence in video games and rebuild the market!



Nintendo Entertainment System

After the video game crash of 1983, which left the U.S. market in a state of disarray, Nintendo was one of the key players that helped to revitalize the industry. The company's approach to re-entering the U.S. market was cautious and strategic, driven by a mix of innovation, marketing savvy, and a firm stance on quality control. The key figures in this process were Hiroshi Yamauchi, then president of Nintendo, and Minoru Arakawa, the president of Nintendo of America, along with Gunpei Yokoi, who was instrumental in creating the design for the Nintendo Entertainment System (NES).

Nintendo entered the U.S. market in 1985, after the crash had caused a massive loss of consumer confidence. Retailers were wary of video games due to the saturation of

low-quality, poorly made titles that had flooded the market prior to the crash. Retailers, once eager to stock game consoles, were now hesitant to take risks on the medium.

Nintendo had to work hard to convince them that video games could be trusted again.

One of the most notable strategies Nintendo employed to overcome this skepticism was to

reshape the perception of their gaming console. They redesigned the Famicom, which had been released in Japan in 1983, into a more neutral and non-threatening device. The company made the NES look like a home entertainment appliance, closely resembling a VCR, to avoid the negative stigma that video game consoles had



acquired in the U.S. This design decision was key, as it helped position the NES not as a toy, but as a legitimate entertainment product that could appeal to a broader audience, including families.

Nintendo also rebranded the console, calling it the Nintendo Entertainment System (NES), emphasizing the idea of a home entertainment experience rather than just a video game machine. This was a deliberate attempt to differentiate it from the “toy-like” consoles that had previously flooded the market. They also introduced the Robotic Operating Buddy (ROB), a peripheral designed to further suggest that the NES was not just another game console but part of a more sophisticated entertainment system (image centre).

The company’s marketing was also pivotal. Nintendo’s ad campaigns were aimed at positioning the NES as a fun, family-friendly entertainment system, making video games a more widely accepted pastime. Nintendo also introduced



a Nintendo Seal of Quality, which further emphasized their commitment to ensuring that only high-quality games were available on their console.

By 1986, Nintendo had successfully gained the trust of both retailers and consumers, and the NES began to dominate the U.S. market. The console’s success was driven by a strong lineup of first-party titles, including Super Mario Bros., which became a cultural phenomenon and helped cement the NES’s place in American homes. Nintendo's approach, combining innovation, careful market penetration, and strict quality control, was a major factor in the revitalization of the video game industry after the crash, leading to the NES becoming one of the most successful consoles of all time.

Characteristic	Specification
Year of Release	1985
CPU	Ricoh 2A03 (1.79 MHz)
Number of Colors on Screen	12
Number of Sound Channels	5
Available Memory	2 KB RAM
Display Resolution (Max)	256x249

Consoles “R” Us

Nintendo knew they needed a strong partner with significant retail presence to enter the U.S. market. They faced significant challenges when trying to convince Toys "R" Us, one of the biggest toy stores in the country, to sell the Nintendo Entertainment System (NES). Retailers, including Toys "R" Us, were skeptical of video games due to the market's collapse, which had left them with unsold inventory of poor-quality products. Toys "R" Us feared investing in a market that had previously resulted in financial losses and tarnished its reputation. However, Nintendo, led by Minoru Arakawa and Hiroshi Yamauchi, used strategic tactics to overcome these objections.

Nintendo rebranded the NES as an "Entertainment System" rather than just a video game console, redesigning it to resemble a VCR. To further reduce the retailer's risk, Nintendo guaranteed sales, ensuring Toys "R" Us wouldn't be left with unsold units. Additionally, Nintendo implemented exclusive licensing agreements with third-party developers, tightly controlling the game library to ensure only high-quality games were available. Toys "R" Us



ultimately agreed to carry the NES because of the reduced risks. Nintendo also launched an aggressive marketing campaign highlighting the NES as a family-friendly system, with the popular Super Mario Bros. included with the console, further appealing to consumers.

The result was a resounding success. By the end of 1985, the NES had sold over 1 million units in the U.S., restarting the video (consoles) games industry (almost) by itself!

Sega Master System

After observing the inroads that Nintendo was making in the huge U.S. Market, Sega decided to release its own video game console. Following the example of Nintendo, it rebranded its console as the Master System to make it sound more powerful.

The Sega Master System featured more advanced technical specifications than its competitors at the time, including the Nintendo Entertainment System (NES). It was powered by the Zilog Z80 microprocessor, running at 3.58 MHz, and came with 8 KB of RAM and 16 KB of video RAM. The system supported a 256-color palette, which allowed for more vibrant and detailed graphics compared to other consoles of the time.

The Master System also featured superior sound capabilities, using the Texas Instruments SN76489 sound chip, which could produce three channels of sound and a noise channel. In terms of gameplay, the Master System used cartridges and supported a wide variety of



peripherals, including the Light Phaser (a light gun) and the 3D Glasses, which allowed for 3D gameplay when used with compatible games.

Characteristic	Specification
Year of Release	1985
CPU	Zilog Z80 (3.58 MHz)
Number of Colors on Screen	32
Number of Sound Channels	4
Available Memory	8 KB RAM
Display Resolution (Max)	256x192

Mattel VS Toys “R” US

By the early 1988, and despite its best efforts, Sega could not compete against Nintendo. Kalinske was approached by Sega’s Japanese parent company, which at the time was struggling to establish itself in the competitive U.S. gaming market, where Atari and Nintendo had established dominance. His hiring came as a result of a strategic move by Sega to bring in someone who had the marketing expertise to help revitalize the brand in North America.

Initially, Kalinske was skeptical about joining Sega. He had reservations about the gaming industry’s reputation, especially after the video game crash of 1983, which had left many skeptical about the longevity of video game consoles. Despite his concerns, he was intrigued by the potential of Sega’s hardware, particularly the Sega Genesis (Mega Drive), which had already achieved significant success in Japan. Kalinske was convinced that Sega could make a comeback in the U.S., but it would require a bold and innovative approach to marketing.

GENESIS DOES WHAT NINTENDON'T.

ARCADE GAMES:



Super Monaco GP™ Michael Jackson's Moonwalker™ E-SWAT™

SPORTS GAMES:



Joe Montana Football™ Pat Riley Basketball™ James "Buster" Douglas Knockout Boxing™

ADVENTURE GAMES:



The Sword of Vermilion™

STRATEGY GAMES:



Columns™

ACTION GAMES:



Dynamite Duke™

Get the hottest new video games going. Arcade, sports, adventure, strategy and action hits available only on the 16-bit Genesis System by Sega.
Today's latest blockbuster arcade hits like Super Monaco GP™. Climb into the cockpit of the world's fastest Grand Prix machines as you race wheel to wheel through the streets at over two-hundred miles per hour. Or take on the evil villain Mr. Big in Michael Jackson's Moonwalker™ as you use dance-kicks, hat-tricks and finally transform into a powerful robot that does it all. Or become a Cybercop in E-SWAT™ and clean up the city besieged by mad terrorists. Get ready for the most action-packed sports games ever. In Joe Montana Football™, check out the defense, make the call, fake a pass and scramble for a touchdown. Or force your opponent to move inside your left hook and nail him with an uppercut that puts him on the mat in James "Buster" Douglas Knockout Boxing™. Or in Pat Riley Basketball™, get the ball with seven seconds left in the game, drive the length of the court, slam-dunk and draw the foul which you make to break the tie.
In The Sword of Vermilion™, make your way through 14 towns and 14 mazes in this adventure thriller where encounters with the evil demons are played in real time on the hand controller. And dazzle your friends with your skills on the puzzle game Columns™. Or become the ultimate commando warrior in Dynamite Duke™ as you blast the enemy from an over-your-shoulder first person view.
There's only one true 16-bit system and it's got the hottest video game hits going. You can only play these on Genesis by Sega. Genesis does what Nintendo doesn't.



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CIRCLE #122 ON READER SERVICE CARD.

Once Kalinske joined Sega of America in 1988, he began overhauling the company’s strategy in the U.S.. His first major move was to focus on differentiating Sega from Nintendo by targeting a more mature audience. He realized that Nintendo’s family-friendly approach had already saturated the market, and there was room for a more rebellious, edgy brand. Kalinske’s team launched a highly effective marketing campaign centered around the tagline "Genesis does what Nintendon't," positioning Sega as the cooler, more advanced choice for gamers. This worked, gaining marketshare, but soon Nintendo would hit Sega back with a vengeance... and a parental advisory board!

TurboGrafx-16

NEC and Hudson Soft envisioned a groundbreaking console that would revolutionize the video game industry. Combining NEC's technological expertise and Hudson's software development prowess, the two companies aimed to create a system that would surpass existing consoles in both performance and appeal. Their goal was to deliver a cutting-edge gaming experience with superior graphics, sound, and gameplay, positioning their console as the ultimate entertainment device of its time. This vision culminated in the release of the PC Engine in Japan in 1987, later rebranded as the TurboGrafx-16 for its 1989 U.S. launch.

The TurboGrafx-16, released in 1987 in Japan as the PC Engine and in 1989 in the U.S. under its revised name, was an ambitious entry into the home console market. Developed by NEC and Hudson Soft, it was rebranded for



its American debut to evoke a sense of power and cutting-edge technology, appealing to Western audiences. Launched in the aftermath of the 1983 video game crash, the console faced stiff competition in the U.S., particularly from Nintendo's NES and, later, Sega's Genesis. Despite modest initial success, it struggled to capture significant market share in the US, largely due to Nintendo's dominance and the TurboGrafx-16's smaller library of standout titles.

The TurboGrafx-16 boasted impressive hardware for its time, featuring an 8-bit CPU and a 16-bit graphics processor, which allowed for vibrant visuals and smooth gameplay. The TurboGrafx-16's graphics and sound capabilities were among its most notable features, setting it apart from many competitors of its time. The system was powered by a custom 16-bit graphics chip, which allowed it to display 482 colors simultaneously from a palette of 512, delivering bright, detailed, and vibrant visuals. This was a significant advantage over Nintendo's NES, which could only display 52 colors at once, giving the TurboGrafx-16 a reputation for offering arcade-quality visuals at home. The system excelled in 2D sprite rendering, enabling smooth animations and richly detailed backgrounds that were a step above what gamers had seen on earlier consoles. Its graphical capabilities shone in games like *R-Type*, which faithfully recreated the arcade experience, and *Bonk's Adventure*, which featured large, expressive character sprites and colorful environments.

In addition to its strong graphics, the TurboGrafx-16 also boasted advanced sound capabilities. The system's PSG (Programmable Sound Generator) chip supported six audio channels, enabling layered and dynamic soundtracks

that enhanced the gaming experience. The addition of the CD-ROM add-on further expanded the audio possibilities, allowing for high-quality, pre-recorded music, voice acting, and sound effects that were nearly unheard of in the console market at the time.

It was the first console to utilize CD-ROM technology with an optional add-on, offering expanded game storage and multimedia capabilities. Key strengths included its compact design, rich sound capabilities, and popular titles like *Bonk's Adventure* and *R-Type*. However, while the system excelled in 2D graphics, it lacked the raw processing power of Sega's Genesis, which better handled fast-paced action games and had stronger marketing in the U.S..

Characteristic	Specification
Year of Release	1989
CPU	Hudson Soft HuC6280 (7.16 MHz)
Number of Colors on Screen	482
Number of Sound Channels	6
Available Memory	8 KB RAM
Display Resolution (Max)	256x240

Sega Genesis / Mega Drive

Tom Kalinske played a key role in the success of the Sega Mega Drive in the United States and Europe, transforming the console into a major competitor against Nintendo's dominance in the late 1980s and early 1990s.

Originally launched in Japan in 1988, the Mega Drive was Sega's answer to the growing demand for 16-bit consoles, offering a significant leap in performance compared to the aging 8-bit systems. Powered by a Motorola 68000 processor clocked at 7.6 MHz, the Mega Drive delivered faster processing speeds, allowing for smoother gameplay and larger, more detailed sprites.

Its graphics capabilities supported up to 61 colors on-screen from a palette of 512, which, combined with its ability to handle complex scrolling and animations, provided a visually rich experience that was a step above its primary competitor, the Nintendo

Entertainment System (NES). The console also featured advanced Yamaha FM sound synthesis, enabling rich, dynamic audio that was leagues ahead of the NES's simple square-wave soundtracks and comparable to arcade-quality sound.

When Kalinske joined Sega of America in 1990, he implemented a bold strategy to push the Mega Drive, known as the Sega Genesis in the U.S., into the



mainstream market. Recognizing Nintendo’s stronghold on younger players, Kalinske repositioned the Mega Drive as a console for older, more sophisticated gamers. Aggressive marketing campaigns touted the Mega Drive’s superior graphics and audio capabilities, with slogans like “Genesis Does What Nintendon’t” directly challenging Nintendo’s dominance. Kalinske also bundled the console with *Sonic the Hedgehog*, a game that showcased the Mega Drive’s speed and vibrant visuals, making it an instant hit. Compared to the NES and NEC’s PC Engine (TurboGrafx-16 in the U.S.), the Mega Drive offered a more modern and powerful platform, able to handle fast-paced action games, detailed sports simulations, and arcade conversions with greater fidelity.

In Europe, where it was launched in 1990 through Virgin Mastertronic, the Mega Drive also carved out a significant market share. Its sleek design, coupled with popular arcade ports like *Golden Axe* and *Altered Beast*, resonated with European gamers seeking an authentic arcade experience at home.



While Nintendo’s Super Nintendo Entertainment System (SNES) eventually arrived to compete in the 16-bit market, the Mega Drive’s earlier release, library of games, and strong marketing campaigns gave it an edge in many regions.

Kalinske’s efforts to highlight the console’s technological strengths and Sega’s commitment to innovation turned the Mega Drive into a defining console of the 16-bit era, setting the stage for one of the most iconic rivalries in gaming history.

Characteristic	Specification
Year of Release	1989
CPU	Motorola 68000 (7.6MHz), Zilog 80 (3.58 MHz)
Number of Colors on Screen	61
Number of Sound Channels	4
Available Memory	64 KB RAM
Display Resolution (Max)	329x240

Nintendo Game Boy

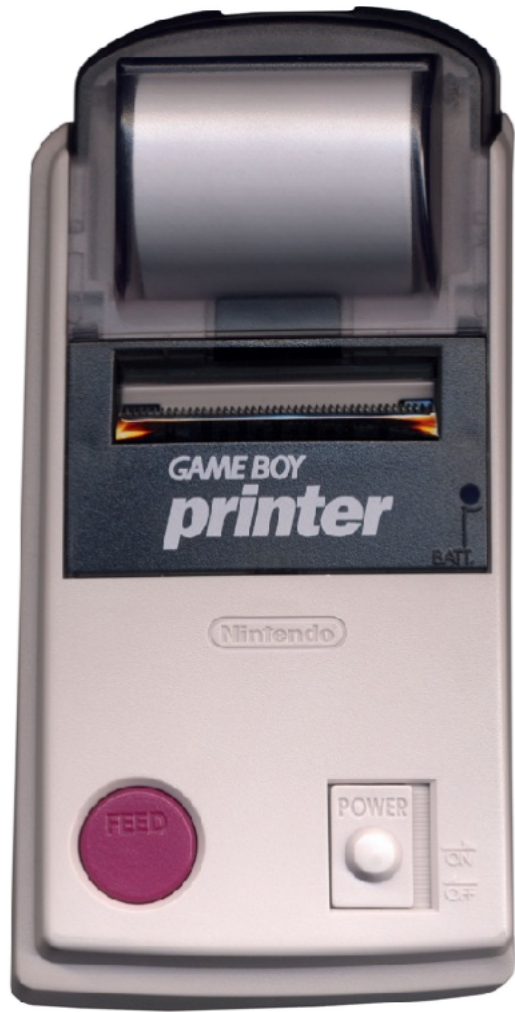
Nintendo's success with its *Game & Watch* series in the 1980s laid the foundation for its venture into portable gaming consoles. The *Game & Watch*, designed by Gunpei Yokoi, was a series of handheld devices that combined simple LCD screens with single-purpose games. Its immense popularity showcased the potential for gaming on the go and demonstrated that there was a market for portable entertainment devices. Inspired by this success, Nintendo envisioned a more versatile handheld console that could run multiple games, allowing players to carry an entire library in their pocket. This vision led to the creation of the Game Boy, a revolutionary product that would transform the gaming landscape.

Developing the Game Boy came with significant challenges. Gunpei Yokoi, the head of the project, had to balance performance, portability, and affordability. Unlike competitors such as Atari's Lynx, which boasted advanced color graphics, Yokoi opted for a simpler black-and-white

screen to prioritize battery life and cost efficiency. The Game Boy's monochromatic display allowed it to run for an impressive 30 hours on four AA batteries, a critical factor in making the console truly portable.

Another challenge was ensuring that the device was durable enough to withstand the rigors of travel, leading to its famously sturdy design. By focusing on practicality and accessibility rather than cutting-edge technology, Nintendo positioned the Game Boy as a device for everyone, not just hardcore gamers.





Selecting the right game to launch with the Game Boy was equally crucial. While Nintendo initially planned to feature *Super Mario Land*, a new entry in its flagship franchise, it recognized that a more universally appealing title could have a broader impact. The answer came in the form of *Tetris*, a puzzle game that appealed to players of all ages, breaking down barriers between casual and dedicated gamers. The story of how Nintendo managed to acquire the rights to the Tetris

multiplayer gaming, popularized by titles like *Tetris*. The Game Boy Camera (image right) and Game Boy Printer (image left) were innovative devices that let users take low-resolution photos, edit them, and print them on thermal paper, showcasing early creative tech integration.

The Gameboy was an incredible success for Nintendo, and it sold millions of units and established Nintendo as the dominant force in handheld gaming, a position it would hold for decades.



game is by itself a long and very interesting story, since it required at least 3 companies to combat bureaucracy and engage in discussions with agencies that had never before dealt with international companies, let alone license or sell video games!

Nintendo released several iconic accessories for the original Game Boy that significantly enhanced its functionality and gameplay experience. The Game Link Cable was a groundbreaking accessory that allowed

Characteristic	Specification
Year of Release	1989
CPU	Sharp SM83 (4.2 MHz)
Number of Colors on Screen	Monochrome
Number of Sound Channels	4
Available Memory	8 KB RAM
Display Resolution (Max)	160x144

Tetris: From Russia With Love



Tetris is one of the most iconic platform games ever released, contributing greatly to the success of the Nintendo Game Boy. However, its acquisition is the subject of several books and a fictional movie. Created in 1984 by Russian programmer Alexey Pajitnov at the Dorodnitsyn Computing Centre of the Soviet Academy of Sciences, Tetris began as a simple puzzle game inspired by pentominoes. Developed on an Elektronika 60 computer, the game quickly spread beyond the USSR, triggering a legal and commercial saga.

The rights to Tetris became part of a huge battle. Pajitnov's colleague shared the game with foreign contacts, leading to unauthorized versions in the West. Hungarian businessman Robert Stein claimed to secure the international rights, licensing Tetris to companies like Mirrorsoft in the UK and Spectrum HoloByte in the U.S.. However, Stein's agreement with Pajitnov was never formalized. Competing claims arose from Atari and others, creating significant confusion.

In 1988, the Soviet government asserted ownership, creating ELORG (Elektronorgtechnika) to manage licensing. Around the same time, Nintendo sought a flagship game for its upcoming handheld console, the Game Boy. Henk Rogers, a Dutch game designer working with Nintendo, discovered Tetris at the Consumer Electronics Show and traveled to Moscow to negotiate directly with ELORG. Rogers bypassed intermediaries, securing exclusive worldwide rights for Nintendo.

The legal battles were intense, with Nintendo defeating Atari to release Tetris as the Game Boy's flagship title in 1989. Its addictive gameplay and universal appeal made both Tetris and the Game Boy global sensations.

Initially, Alexey Pajitnov saw little financial benefit but regained the rights in 1996, forming The Tetris Company with Henk Rogers. Tetris remains a testament to brilliant design and the turbulent history of intellectual property during the Cold War era.

Atari Lynx

The Atari Lynx, released in 1989, was a groundbreaking handheld gaming console and the first to feature a color LCD screen. It was designed by R.J. Mical and Dave Needle, who had previously contributed to the development of the Amiga computer.

Originally conceived as the *Handy* by Epyx, the project was acquired by Atari when Epyx encountered financial difficulties. The Lynx was powered by a custom 16-bit CPU (MOS 65C02 at 4 MHz) and included 64 KB of RAM, offering advanced graphics capabilities such as hardware scaling, rotation, and sprite handling. Its 3.5-inch display could show 16 colors from a palette of 4,096 and was



paired with 4-channel stereo sound for an immersive experience. However, the device required 6 AA batteries, which provided only 4 to 6 hours of gameplay, a significant drawback compared to its competitors.

The Lynx faced stiff competition in the handheld market, particularly from the Nintendo Game Boy, which was released the same year. The

Game Boy's monochrome screen, longer battery life (up to 15 hours), lower price (\$89.99 compared to the Lynx's \$179.99), and extensive game library gave it a significant edge. Other rivals included the Sega Game Gear and NEC TurboExpress,

which also featured color screens but struggled with similar battery issues.

Despite its technological superiority, including features like ambidextrous design (with a “flip” button for left-handed players) and multiplayer connectivity for up to 8 systems via the *ComLynx* cable, the Lynx failed to gain a strong foothold in the market. Its high price, short battery life, and limited game library—despite standout titles like *California Games*, *Blue Lightning*, and *Todd’s Adventures in Slime World*—hindered its appeal to consumers.

Ultimately, the Atari Lynx sold approximately 3 million units, far below the Nintendo Game Boy’s 118 million. Poor marketing strategies, a lack of third-party developer support, and Atari’s declining reputation further undermined its potential. However, the Lynx introduced several innovative features that were ahead of their time, including hardware-accelerated graphics and a vibrant color display. While it failed to compete commercially, the Lynx remains a beloved system among retro gaming enthusiasts and is remembered as a pioneer that paved the



way for more advanced handheld gaming systems. Its legacy continues as a reminder of the challenges of combining innovation with market viability. The Atari Lynx II, released in 1991, was a redesigned and improved

version of the original Lynx. It featured a more compact and ergonomic form, making it easier to hold for extended gaming sessions. The Lynx II (image centre) also boasted a longer battery life, providing up to 8 hours of gameplay.

Despite these improvements, the Lynx II failed to overcome the dominance of the Game Boy and faced the same challenges that hindered the original Lynx, such as limited game support and high production costs.

Characteristic	Specification
Year of Release	1989
CPU	MOS 65C02 (4 MHz)
Number of Colors on Screen	16
Number of Sound Channels	4
Available Memory	64 KB RAM
Display Resolution (Max)	160x102

Sega Game Gear

The SEGA Game Gear, released in 1990, was SEGA's decision to enter the handheld gaming market in response to the success of the Nintendo Game Boy. The project was spearheaded by SEGA's American division, with an aim to capitalize on the growing portable gaming trend. It was designed to provide a more advanced, color-screen alternative to the Game Boy, and it boasted impressive technical characteristics for its time, including a 3.2-inch color LCD screen, a Zilog Z80 processor, 8 KB of RAM, and 4-channel stereo sound. Its graphics were more sophisticated compared to the Game Boy, supporting a larger color palette, but its battery life was significantly shorter, providing only about 3 to 5 hours of gameplay on six AA batteries.

The Game Gear faced stiff competition from the Nintendo Game Boy, which was the dominant handheld console at the time, and the Atari Lynx. Its main selling points were its color display and superior audio, but these features came



at the cost of portability due to its bulky size and short battery life. Despite a strong library of games, the Game Gear's high price, poor battery life, and SEGA's lack of marketing support ultimately led to its commercial failure, selling only around 10 million units. The Game Gear was discontinued in 1997, after failing to compete with the Gameboy.

Characteristic	Specification
Year of Release	1990
CPU	Zilog Z80 (3.58 MHz)
Number of Colors on Screen	32
Number of Sound Channels	3
Available Memory	8 KB RAM
Display Resolution (Max)	160x144

Neo Geo

The Neo Geo was created by SNK (Shin Nihon Kikaku), a Japanese video game hardware and software company, with the goal of offering arcade-quality gaming experiences at home. Released in 1990, the Neo Geo was developed by SNK to cater to the growing demand for high-quality, coin-op style games that could be played in the comfort of one's home. SNK, known for its arcade games, wanted to bring the exceptional quality of its arcade titles to the home console market, creating a system that could replicate the performance and graphics of arcade machines.

The reasoning behind the Neo Geo was simple: SNK recognized the potential for a home console that could provide near-identical arcade-quality experiences, which was largely unmatched by other home consoles at the



time.

It was powered by the Motorola 68000 processor, with 64 KB of RAM for the main system and additional video memory. The decision to use such powerful components allowed the Neo Geo to deliver superior graphics and sound compared to its competitors, making it stand out in the market. The system could display 4096 colors and supported up to 330 sprites on-screen simultaneously, offering rich and vibrant visuals that were cutting-edge for its era.

The Neo Geo's main competitors were the Super Nintendo Entertainment System (SNES) and Sega Genesis, both of which offered more affordable home consoles but with much less graphical power compared to the Neo Geo. While the SNES and Genesis were more focused on 2D sprite-based games, the Neo Geo was engineered to

support high-end 2D arcade games with sophisticated animations and detailed character sprites.

One of the Neo Geo's main advantages was its arcade-perfect games, such as the *King of Fighters*, *Samurai Shodown*, and *Metal Slug* series. These titles were direct ports from SNK's arcade machines, offering a gaming experience unmatched by home consoles. The unique features of the Neo Geo included its large, high-quality game cartridges, which were capable of holding more data than typical home console cartridges, and the exceptional audio-visual fidelity it provided. Another standout feature was its dual controller ports, allowing two-player local gaming without the need for additional accessories.

However, the Neo Geo had a major flaw: its high price. The console was initially priced at around \$649 for the home system, and the games cost \$200-\$300 each, which made it incredibly expensive compared to the SNES or Genesis, which sold for around \$200. This high price point limited its



accessibility to a niche, affluent audience, and most consumers opted for more affordable alternatives.

Ultimately, despite its impressive hardware and exclusive game library, the Neo Geo failed in the mass market. The high cost of the console and games, along with the fact that it lacked the broader third-party developer support that consoles like the SNES and Genesis enjoyed, led to its commercial failure. It sold only about 1 million units by the time it was discontinued. However, the Neo Geo remains a cult classic among retro gaming enthusiasts and is often remembered as a trailblazer in terms of hardware power and arcade-quality gaming.

Characteristic	Specification
Year of Release	1990
CPU	Motorola 68000 (12 MHz), Zilog Z80A (4 MHz)
Number of Colors on Screen	4096
Number of Sound Channels	4
Available Memory	64 KB RAM
Display Resolution (Max)	320x224

Super Nintendo Entertainment System

The Super Nintendo Entertainment System (SNES), released in 1990 in Japan as the Super Famicom, marked a significant advancement in gaming technology for its time and was developed by Nintendo as the successor to the highly successful Nintendo Entertainment System (NES).

After the NES (image center, European version) became a global success, Nintendo faced increasing pressure from competitors, particularly Sega, which was gaining traction with its Genesis (Mega Drive) console. The development of the SNES began in the mid-1980s when Nintendo recognized the need to develop a more powerful system to compete with the rising capabilities of home consoles, especially in the realm of 16-bit graphics and sound.



A key decision in the development of the SNES was the choice of hardware design. Initially, Nintendo worked with Sony to develop a CD-ROM add-on for the NES, but after disputes over control and royalties, the partnership was dissolved, and Sony

later went on to develop the PlayStation. This led Nintendo to focus on cartridge-based games, which they believed were faster and more reliable than CDs for gaming purposes. The

hardware design was entrusted to a team led by Masayuki Uemura, and the system was equipped with a Ricoh 5A22 processor (based on the WDC 65C816), running at 3.58 MHz, providing significantly improved

performance compared to the NES. The SNES also featured 128 KB of RAM, allowing for more complex and graphically detailed games.

The main competitor to the SNES was the Sega Genesis (Mega Drive), which had been released a year earlier and offered similar 16-bit graphics but a faster processor. The competition was fierce, with Sega marketing the Genesis as the more “adult” and cutting-edge console, while Nintendo stuck to its family-friendly image. One of the major lessons learned from the NES was the need for strong third-party developer support, which Nintendo secured early by offering exclusive titles from major franchises like Super Mario, Zelda, and Metroid, alongside new games like Super Mario World. Additionally, Nintendo ensured the SNES had superior audio-visual capabilities, with its Mode 7 graphics (which allowed for rotation and scaling of backgrounds), delivering immersive experiences in games like *F-Zero* and *Super Mario Kart*.

The SNES was a much more powerful game console than its predecessor, running on a 16-bit processor capable of displaying up to 256 colors on screen out of a palette of 32,768, as well as 8-channel stereo sound powered by a Sony SPC700 audio processor. The system's resolution could reach 512x448 pixels, and it had 128 KB of RAM,

which was substantial for its time. The console's cartridges could store between 2 MB and 4 MB of data, which was significantly more than the NES's capacity.

The SNES was a commercial success, selling over 49 million units worldwide, and it solidified Nintendo’s dominance in the console market for much of the 1990s. It also gave rise to some of the most iconic and beloved video game franchises of all time, including *Super Mario World*, *The Legend of Zelda: A Link to the Past*, *Final Fantasy VI*, and *Chrono Trigger*. Nintendo’s attention to quality, innovation, and developer relationships helped the SNES maintain a competitive edge against the Genesis, despite the latter’s faster processing power, and it helped cement it as a market dominant video game console.

Characteristic	Specification
Year of Release	1990
CPU	Ricoh 5A22 (3.58 MHz)
Number of Colors on Screen	256
Number of Sound Channels	8
Available Memory	128 KB RAM
Display Resolution (Max)	512x448

In this chapter...

In **Chapter 8** we explored the resurgence of the U.S. video console market, ignited by Nintendo with its Entertainment System. SEGA quickly followed suit, introducing its own systems and making a significant impact with the Mega Drive. The unexpected—and largely unpredictable—success of this new generation of video game consoles sparked a fierce battle for dominance, both in marketing and technology, as more competitors entered the fray. This competition ultimately led to the emergence of a new market: portable video game consoles with interchangeable cartridges. Nintendo, SEGA, and Atari, among others, vied for market share, but it was Nintendo and its Game Boy that ultimately triumphed. While not necessarily ahead in graphics, Nintendo dominated in market share and the availability of quality games. Through its efforts, Nintendo singlehandedly revived a market that had been severely damaged, transforming gaming consoles from being viewed as toxic into a mainstream household staple.



• 9 •

The New Games Era

"You fool! You gave cheese to a lactose
intolerant volcano God"

(Secret of Monkey Island)

Introduction

The rise of the 16-bit era, characterized by faster microprocessors, improved graphics and sound, and increased storage (initially on floppy disks and later on hard drives), fueled significant innovations in video game development. Initially, game developers focused on supporting 8-bit computers, porting games to popular platforms like the Commodore 64, Spectrum, and Amstrad CPC. However, by the end of the decade, the majority of games were tailored to the capabilities of the Atari ST, Commodore Amiga, and IBM-compatible PCs.

The 1980s also witnessed the emergence of animated graphic adventures, producing some of the most iconic games in the genre, powered by unique game engines from Sierra and Lucasfilm. Titles like *Shadow of the Beast* showcased the remarkable potential of home computers, bringing gaming experiences that rivaled, if not surpassed, the arcade versions. The PC, too, began to establish itself as a legitimate gaming platform, as companies experimented with new VGA standards and audio technology, further enhancing the gaming experience.



AGI

“We are developing a new inexpensive computer that is faster and better at playing games than the likes of our competitors. And we want you to create a new, ground-breaking game with animated graphics and an engaging story to go with it. Oh, and we will cover all the expenses for development, publishing, marketing, royalties (for you) and all - just get started”. That was IBM, hot on the heels of developing their IBM PCjr, asking Sierra to develop a new game for them.

Roberta Williams was excited! The time had come to really shine through, having a much larger budget that would allow her -at last!- to create a far more engaging game, more closely resembling an interactive fairy tale. But first, they had to invent the technology to do so! So, they decided to create one of the first game engines that would allow them to animate and control sprites on screen with either the keyboard or a joystick, and to traverse a virtual, non-linear world. Thus, the Adventure Game Interpreter

(AGI) was created, used as a prototype for their first (and last!) Adventure game of its kind, that would soon propel Sierra into stardom with one of the most recognisable figures in video game history... and with more adventures to come... but that is another story!



King's Quest

Some games have a profound impact on an entire market. King's Quest (as it was the original name for the IBM PC Jr), or King's Quest I: Quest for the Crown, as it was named later, is one such game. It managed to establish a new genre, the animated graphics adventure game, and establishing Sierra On-Line as a (mainly) adventure game company.

The story of King's Quest I: Quest for the Crown centers around Sir Graham, a brave knight tasked by the ailing King Edward of Daventry with a perilous mission to restore the kingdom's lost prosperity. Daventry is in decline due to the loss of three magical treasures: a mirror that foretells the future, a shield that makes its bearer invincible, and a chest that produces endless gold. If Graham succeeds in recovering all three treasures, he will be named Edward's heir to the throne. Players guide Graham through a fantastical world

filled with fairy-tale creatures and puzzles, exploring forests, castles, mountains, and caves to retrieve the treasures. The game's nonlinear structure allows players to tackle objectives in any order, though they must solve puzzles and overcome dangers using wit and creativity.



Roberta Williams drew heavily on classic fairy tales and folklore for the game's story and setting, infusing the narrative with a whimsical yet perilous charm. The game is peppered with references to familiar stories, such as Jack and the Beanstalk, Rumpelstiltskin, and Hansel and Gretel. These influences created a world where players could interact with iconic elements from beloved tales. Roberta's storytelling added depth to these inspirations, creating a rich tapestry of characters, humor, and mystery. Unlike many text-based adventures of the time, King's Quest brought its world to life with vivid visuals and a sense of agency, allowing

players to feel as if they were truly immersed in a fairy tale. This approach was a natural evolution of Sierra’s previous game, *The Wizard and the Princess*, a 1980 text-and-graphics adventure that was one of the first to combine images with a narrative. However, *King’s Quest* took this concept further by fully animating characters and environments, setting a new standard for storytelling in games.

The controls of *King’s Quest I* combined keyboard-based commands and arrow key navigation. Players moved Sir Graham around the screen using the arrow keys while typing text commands (e.g., “get key” or “open door”) to interact with objects and characters. This mix of graphical exploration and text-based input allowed for a level of interaction and immersion that was revolutionary at the time. The game’s engine, the Adventure Game Interpreter (AGI), was key to enabling these mechanics, introducing features like real-time animations and a dynamic, explorable environment. Despite the technical limitations of early PCs, the AGI engine allowed for a seamless blend of visuals and gameplay, giving *King’s Quest* a cutting-edge feel.

Initially developed for IBM’s PCjr, *King’s Quest* was later ported to a variety of platforms after the PCjr’s commercial failure. These included the IBM PC (with CGA, EGA, and VGA graphics), Tandy 1000, Apple II and IIGS, Commodore Amiga, and Atari ST..

Critically, *King’s Quest I* was a groundbreaking success. Reviewers and players praised its innovative design, which set it apart from the text-heavy adventure games of the era. The combination of vibrant graphics, animated characters, and a richly interactive world was hailed as revolutionary. The game’s use of storytelling, inspired by Roberta Williams’ deep love for fairy tales, captivated players and helped establish Sierra as a leader in the industry. The critical acclaim translated into commercial success, and *King’s Quest* became a bestseller on multiple platforms.

Game details:	
Year of Release	1985
Systems:	Atari 5200 / 400 / 800, C64
Genre:	3D Action Simulation
Developer:	David Fox
Publisher:	Atari / Lucasfilm

Animated Graphic Adventure



The development of *King's Quest* by Sierra On-Line for IBM's PCjr marked a significant milestone in video game history, but it was fraught with technical challenges and business risks. In 1982, IBM approached Sierra to create a flagship game for its upcoming PCjr, a home-oriented version of the IBM PC. This collaboration came with an unprecedented funding package of \$850,000, which provided Sierra, a company struggling amidst the early 1980s video game crash, a much-needed financial lifeline. Roberta Williams, Sierra's co-founder and the creative force behind the game, envisioned *King's Quest* as a revolutionary departure from the static text adventures that dominated the era. She sought to create an interactive fairy tale with an animated third-person protagonist, Sir Graham, who could explore a fully realized 3D world with depth, perspective, and interactivity. This ambitious vision required Sierra to build an entirely new game engine, the Adventure Game Interpreter (AGI), which allowed for

animated characters and real-time interaction within graphically rich environments.

However, the PCjr hardware posed significant challenges. Although it introduced innovations like 16-color graphics and a three-voice sound chip, its performance was limited, and its hardware design, including poor memory management and a subpar keyboard, frustrated developers. Despite these hurdles, Sierra delivered a technically impressive product that showcased the PCjr's capabilities. Unfortunately, the PCjr itself was a commercial failure after its 1984 launch, due to its high price, limited software library, and poor reception of its chiclet keyboard. IBM discontinued the platform in 1985, creating an existential threat to Sierra, which had pinned its hopes on the PCjr's success.

To mitigate this crisis, Sierra quickly ported *King's Quest* to more successful platforms, including the IBM PC (with

support for CGA, EGA, and later VGA graphics), Apple II and IIGS, Tandy 1000 (a PCjr-compatible system with better market penetration), Commodore Amiga, and Atari ST.

These ports allowed the game to reach a much wider audience, ensuring its survival and eventual success. The broader availability of the game turned *King's Quest* into a commercial hit, earning critical acclaim for its groundbreaking graphics and interactive gameplay. It set a new standard for graphical adventures, cementing Sierra's reputation as an industry leader.

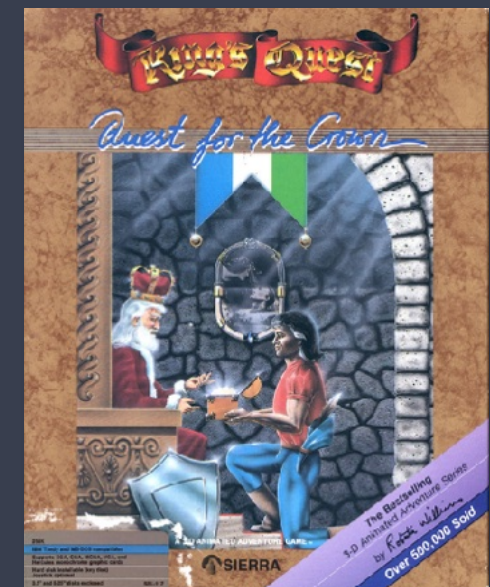
The financial backing from IBM and the success of *King's Quest* helped Sierra survive the video game crash, which had bankrupted many other companies. With this

momentum, Sierra went on to become a dominant force in the PC gaming industry, pioneering other iconic adventure game franchises like *Space Quest*, *Leisure Suit Larry*, and *Gabriel Knight*. *King's Quest* itself grew into a long-running franchise, with eight sequels released over the next two decades. The AGI engine, initially

developed for *King's Quest*, became the foundation for Sierra's early adventure games until it was replaced by the more advanced Sierra Creative Interpreter (SCI) engine.

Despite the PCjr's failure, *King's Quest* left an incredible mark on the gaming industry. It popularized graphical adventure games, introduced innovations in interactive storytelling, and showcased how adversity could be turned into opportunity. IBM's funding, combined with Sierra's ability to adapt and innovate,

not only kept the company afloat during one of the industry's most turbulent periods but also helped redefine the possibilities of computer games. The success of *King's Quest* ensured Sierra's legacy as a pioneer in the gaming world and laid the groundwork for decades of innovation in interactive entertainment (**images:** Left, original IBM PCjr packaging, middle, *King's Quest* for Tandy 1000, Right, *King's Quest: Quest for the Crown* for PC, and later Atari ST and Amiga).



Rescue on Fractalus!

Rescue on Fractalus! (1985), created by David Fox and developed by Lucasfilm Games, is a pioneering action game that featured groundbreaking 3D vector graphics for its time. It was initially released for the Atari 8-bit family of computers and later ported to other systems like the Commodore 64. The game stood out not only for its innovative graphics but also for its atmospheric gameplay, which combined action, strategy, and immersive design.

In *Rescue on Fractalus!*, players take on the role of a pilot flying a futuristic spacecraft, tasked with rescuing stranded pilots on a hostile alien planet. The game's plot revolves around a rescue mission on a jagged and dangerous planet called Fractalus, where the terrain is filled with towering mountains, caves, and treacherous conditions.

The gameplay focuses on navigating through this rugged landscape, which is procedurally generated using fractal terrain generation technology, creating unique, unpredictable environments each time the game is played.

The objective of the game is simple: locate the downed pilots and safely land to rescue them. However, the environment is filled with dangers. The most notable challenge comes from hostile alien creatures called Jaggies, which resemble monstrous, jagged-faced entities that attack the player's ship. The Jaggies often appear suddenly in the mountainous terrain, and players must quickly identify and evade them to avoid losing their ship or the rescued pilots.

Gameplay takes place in a 3D, wireframe-style landscape, with players piloting their craft through narrow canyons, valleys, and steep mountain slopes. The view is from the cockpit, which is constantly shifting as the player moves through the alien planet's treacherous terrain. Players must carefully navigate the environment, using radar and a limited fuel supply, while attempting to locate the stranded pilots and avoid crashing into obstacles.

One of the most exciting and innovative aspects of the gameplay is the rescue process itself. Once a stranded pilot is located, players must land their ship, carefully controlling the ship's descent while maintaining the correct altitude and avoiding crashing into the jagged landscape. Once on the ground, the pilot can be picked up and taken back to the player's base. The game rewards players with points for successful rescues and penalizes them for crashes or taking too long to rescue pilots.

The *Rescue on Fractalus!* gameplay experience was further enhanced by its sophisticated use of 3D vector graphics. The planet's jagged, mountainous surface was dynamically generated using fractal algorithms, which gave the game a distinct, visually impressive look. The procedural

generation of the terrain meant that no two playthroughs were alike, adding replay value and excitement.

The game also featured sound effects that contributed to its tense atmosphere. The sounds of the spaceship's engines, the communication with base, and the eerie growls of the Jaggies all helped immerse players in the hostile environment of Fractalus.

The combination of dynamic terrain, hostile enemies, strategic rescue missions, and the innovative use of vector graphics made *Rescue on Fractalus!* a unique and challenging experience. It marked a milestone in the evolution of video games, setting the stage for more complex action and simulation titles in the years that followed.



Game details:	
Year of Release	1985
Systems:	Atari 5200 / 400 / 800, C64
Genre:	3D Action Simulation
Developer:	David Fox
Publisher:	Atari / Lucasfilm

Fractalus

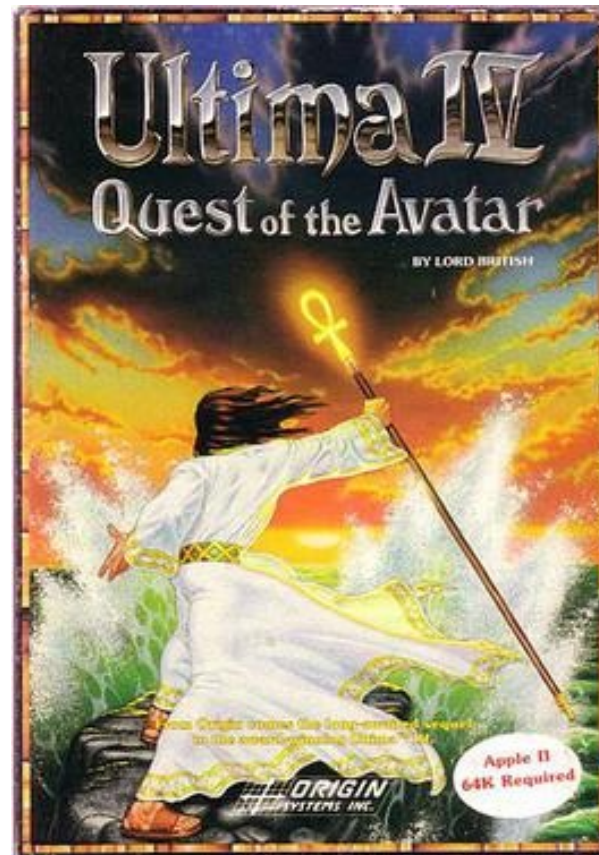
David Fox put the Atari 400 and 800 and its incredible—for its time—hardware to its paces. He and his team at Lucasfilm Games created an amazing, fluid pseudo 3D game of rescue, allowing the player to navigate the canyons of an unforgiving alien planet. Your mission: a humanitarian one, to rescue stranded pilots and bring them into the safety of your ship.

One day, George Lucas decided to pay the team a visit. He tried flying the spaceship with the joystick, and to his astonishment, could not get the fire button to work! David explained that he didn't want players to shoot things. However, George would have the last word. After all, didn't the world enjoy his marvelous space fights with X-Wings and Tie-Fighters? Surely, this little gem of a game could do with some action. He wanted the player to be able to shoot the enemy ships. And, what if, every now and then, an alien disguised as a desperate pilot being rescued, attacked the ship at the last moment? David agreed, and he and his team went back to the drawing board for some serious changes... **(Edited by David Fox!)**



Ultima IV

Richard Garriott – aka Lord British – had proved he could literally create immersive digital worlds. The fourth installment of his *Ultima* series was meant to be another breakthrough in the evolution of interactive storytelling and game design. *Ultima IV: Quest of the Avatar*, released in 1985, was a dramatic departure from its predecessors, marking a shift from traditional role-playing games focused on defeating enemies and collecting loot, to a philosophical and introspective journey about the nature of virtue and morality. Garriott, already recognized as a pioneer in the genre, sought to craft a game that not only entertained but also challenged players to consider deeper concepts of personal ethics and growth.



Set in the fictional world of Britannia, *Ultima IV* put players in the shoes of a protagonist tasked with achieving the status of the Avatar, an individual who embodies the eight virtues of Honesty, Compassion, Valor, Justice, Sacrifice, Honor, Spirituality, and Humility. Rather than embarking on a quest to save the world from an imminent evil, the game asked players to explore their own moral compass, with the ultimate goal being self-improvement and spiritual enlightenment. Players were required to actively practice these virtues by making choices that reflected them, affecting both the narrative and the way characters interacted with the player.

What set *Ultima IV* apart from previous games was its revolutionary gameplay mechanics. It was one of the first RPGs to implement a morality system, in which actions had real consequences, and the player's decisions directly influenced their path. This approach to

non-linear storytelling was groundbreaking, allowing players to explore Britannia at their own pace and shape their own journey. The game's world was vast, filled with towns, dungeons, and a variety of NPCs, each offering quests and advice that helped the player in their search for enlightenment. The combination of exploration, puzzle-solving, and moral dilemmas set *Ultima IV* apart from its contemporaries.

Visually, *Ultima IV* was impressive for its time. It featured a top-down perspective and used ASCII characters to represent towns, dungeons, and landscapes. While not as graphically advanced as later games, the game's design was detailed and efficient for the hardware of the era. The innovative design also extended to its sound and music, with simple but effective chiptunes creating an atmosphere of adventure.

In terms of technical innovation, *Ultima IV* also stood out for its use of save game features, which allowed players to return to their progress at any time, a critical feature for games of its scope. The game was originally released for the Apple II, but due to its success, it was ported to a wide

range of platforms, including the Commodore 64, IBM PC, and NES, making it accessible to a larger audience.

Ultima IV was not without its challenges. The non-combat, virtue-based gameplay was a stark contrast to the more action-driven RPGs of the time, and many players found it difficult to adjust. The game's emphasis on moral decision-making, while groundbreaking, was also a departure from the more straightforward hero's journey, which some players had expected from a fantasy RPG. Still, its success marked a turning point in the RPG genre, pushing the boundaries of what games could explore in terms of narrative, morality, and player agency.



Game details:	
Year of Release	1985
Systems:	Apple II, PC
Genre:	Role Playing Game
Developer:	Richard Garriott
Publisher:	Origin Systems

GAUNTLET

Ed Logg, a veteran designer at Atari Games, was no stranger to innovation. With hits like *Asteroids* and *Centipede* under his belt, he was eager to explore new gaming horizons. Inspired by John Palevich's *Dandy* on the Atari 8-bit computers and the procedurally generated dungeons of *Rogue*, Ed envisioned something bigger—an arcade game that would capture the thrill of dungeon crawling while allowing players to work together in a chaotic yet strategic battle for survival. Thus, *Gauntlet* was born. But not without some creative pivots along the way.

Ed's concept began with a single-player focus, but a conversation with his team sparked an idea: what if players could take on different roles, each with unique strengths and weaknesses, encouraging teamwork? A bold experiment at the time, the four-player format would become *Gauntlet*'s defining feature. He added a Warrior with devastating melee attacks, a Wizard who could unleash powerful magic, a nimble Elf with unmatched speed, and a Valkyrie who balanced offense and defense.



Suddenly, this was no longer just a dungeon crawl—it was a cooperative quest where players had to rely on each other to survive.

The game's top-down perspective offered players a clear view of sprawling, maze-like dungeons filled with hordes of enemies, treasure, and hazards. Monsters poured out of generators that needed to be destroyed, while players scavenged for keys to unlock doors, food to restore health, and potions to unleash devastating attacks. Health, however, was always draining—a mechanic Ed deliberately designed to create urgency. Every moment was a race against time and death itself, which literally roamed the

dungeons, ready to sap the life from anyone brave—or foolish—enough to get too close.

As the team worked on the game, sound and visuals became key to *Gauntlet's* allure. The dungeon aesthetic was dark and atmospheric, with flickering torches and intricate walls framing the chaos. Characters and enemies, rendered in colorful, detailed sprites, were instantly recognizable. But it was the sound that made *Gauntlet* unforgettable.

Digitized voice lines, a rarity in 1985, brought the game to life: “Elf needs food badly!” warned players of imminent danger, while other prompts added drama and immersion. The cacophony of clashing swords, crumbling walls, and the ominous hum of ghostly enemies made the arcade cabinets stand out in noisy game rooms.

When *Gauntlet* hit arcades, it was an instant sensation. It wasn’t just a game—it was an experience. Players gathered around the cabinet, strategizing, shouting directions, and laughing as they jostled for survival. It redefined what

arcade gaming could be, pioneering cooperative multiplayer in a way that few games had attempted before. Ports to home systems like the Commodore 64, ZX

Spectrum, Amstrad CPC, and later the Amiga and IBM PC, brought the experience to even wider audiences.

Gauntlet's legacy is vast. It not only popularized the dungeon crawler genre but also influenced countless action RPGs and co-op games that followed. Its blend of frantic action, strategic depth, and social gameplay was revolutionary.



Game details:	
Year of Release	1985
Systems:	Arcade, Atari ST
Genre:	Dungeon Crawler
Developer:	Ed Logg
Publisher:	Atai

Super Mario Bros.

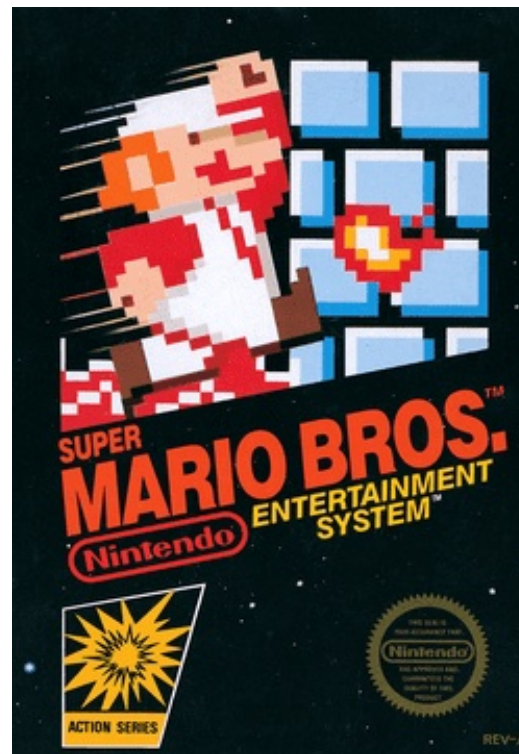
Shigeru Miyamoto, a young and imaginative designer at Nintendo, had already made waves in the gaming world with *Donkey Kong* and *Mario Bros.*, but in 1985, he was about to create something that would define the future of gaming. At the time, Nintendo was looking to develop a flagship title for its Famicom system (known as the Nintendo Entertainment System, or NES, outside Japan) that could show off the console's capabilities and set it apart from competitors like SEGA.

Miyamoto envisioned a game that would not only be larger and more intricate than anything Nintendo had created before but one that would capture the joy of exploration and adventure.

The concept for *Super Mario Bros.* came from Miyamoto's love of storytelling and his desire to create a game that felt like a journey. Drawing from his childhood memories of

running through the countryside and discovering secret caves and streams, he wanted players to feel a sense of wonder as they traveled through a vibrant, fantastical world. Working alongside Takashi Tezuka and a small team of developers, Miyamoto began crafting a side-scrolling platformer that would push the Famicom to its limits.

Originally, the game was conceived as a more straightforward arcade-style experience, but during development, it evolved into something far more ambitious. Miyamoto and Tezuka introduced sprawling levels, hidden secrets, and power-ups that transformed gameplay. The Super Mushroom, Fire Flower, and Starman not only gave players new abilities but also created a sense of discovery and empowerment. The iconic flagpole at the end of each level gave a satisfying conclusion to every stage, reinforcing the feeling of progress.



The main features of *Super Mario Bros.* were groundbreaking. The game introduced expansive, side-scrolling levels, each with unique challenges, enemies, and environments. Players controlled Mario—or Luigi in two-player mode—as they navigated the Mushroom Kingdom to rescue Princess Toadstool from the evil Bowser. The game’s design was a masterclass in pacing, gradually increasing difficulty while teaching players new mechanics. Its music, composed by Koji Kondo, became instantly iconic, with the cheerful overworld theme and tense castle music perfectly complementing the action.

What made *Super Mario Bros.* stand out wasn’t just its technical achievements but its charm and accessibility. The game was colorful, whimsical, and filled with personality, from the Goombas and Koopa Troopas to the pipes and clouds that looked like smiling faces. The controls were tight and responsive, making Mario’s jumps and movements feel natural and rewarding. Hidden blocks, warp zones, and secret pathways encouraged exploration and replayability, keeping players coming back for more.



For Nintendo, *Super Mario Bros.* was more than just a hit—it was a revolution. Released alongside the NES in North America, it became the console’s killer app, showing players what the system was capable of and helping

Nintendo dominate the market. The game sold over 40 million copies worldwide, making it the best-selling video game of all time for decades.

Super Mario Bros. didn’t just solidify Mario as Nintendo’s mascot; it redefined what video games could be, proving that they could deliver

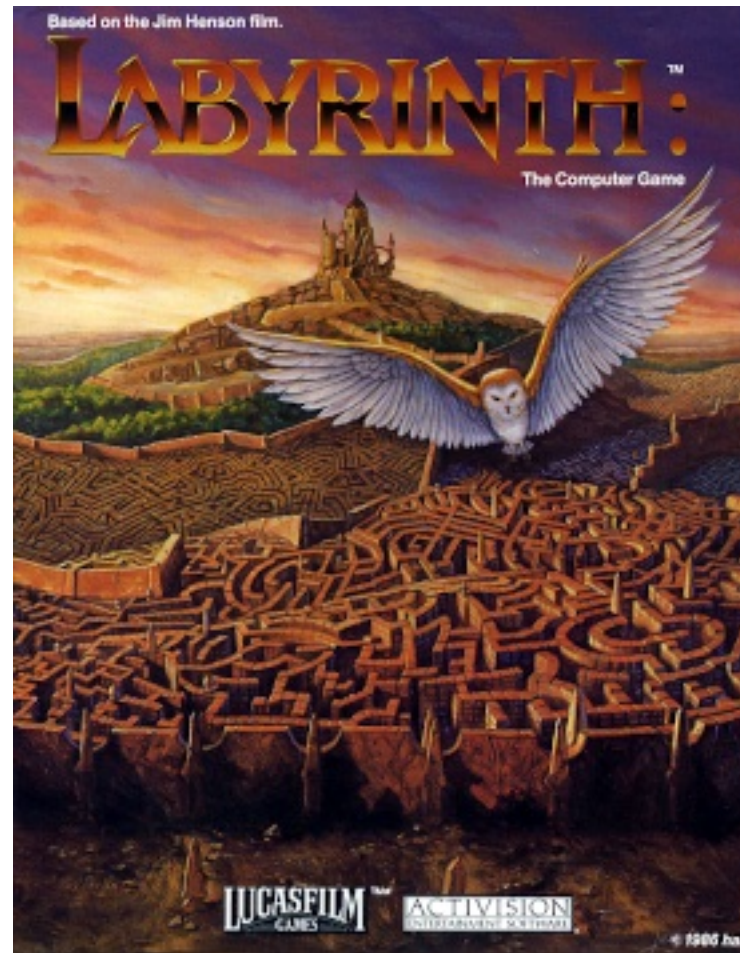
immersive, unforgettable adventures. It set a standard for platformers and inspired countless games and developers.

Game details:	
Year of Release	1985
Systems:	NES
Genre:	Platformer
Developer:	Shigeru Miyamoto
Publisher:	Nintendo

Labyrinth: The Computer Game

David Fox, one of the first game designers at Lucasfilm Games, was handed a monumental task in 1986: to create a game based on Jim Henson's *Labyrinth*, the fantasy film starring David Bowie and Jennifer Connelly. For Fox, the challenge was not just to adapt the movie's rich, otherworldly aesthetic but to do so in a way that would showcase Lucasfilm Games as a studio capable of pushing boundaries. At the time, Lucasfilm was still new to video games, and *Labyrinth: The Computer Game* was to be its first adventure title. It was a proving ground for the studio and a chance to show the world that storytelling and interactivity could merge into something magical.

Fox and his small team, including designer Charlie Kellner and programmer Noah Falstein, approached the project



with an innovative mindset. Rather than relying on the arcade-style gameplay that dominated the industry, they focused on creating an experience that captured the film's whimsical yet eerie tone. The result was a hybrid adventure game that combined elements of puzzle-solving, exploration, and narrative in a way that hadn't been seen before. The game started with a unique twist: the opening segment was a text-based adventure that suddenly transformed into a graphical one—a nod to the evolving state of video games in the mid-1980s.

What truly stood out in *Labyrinth* was its intuitive control system. At a time when adventure games often relied on cumbersome text parsers, which required players to type commands like "PICK UP KEY" or "OPEN DOOR," Fox and his team wanted something more accessible. They devised

a streamlined "slot machine" interface, where players could choose actions from a spinning menu of verbs (like "USE" or "TALK") and combine them with objects and characters. This eliminated the guesswork and frustration of traditional parsers, making the game more approachable and faster-paced. It was an early experiment in simplifying adventure game mechanics, paving the way for even greater innovations.

While the slot-machine system was intuitive, it wasn't perfect, and it inspired Lucasfilm Games to seek an even better solution for future projects. This led to the creation of SCUMM (see page "SCUMM"), allowing players to directly interact with the environment without the need for complex menus. Fox's work on *Labyrinth* laid the foundation for this innovation, showing Lucasfilm Games the potential of accessible, player-friendly design.

Labyrinth wasn't just a technical milestone for Lucasfilm Games; it was also a statement of intent. The game's quirky humor, immersive puzzles, and commitment to storytelling

were hallmarks of what the studio would become known for. It was a critical stepping stone to *Maniac Mansion*, *The Secret of Monkey Island*, and the many adventure classics that followed.



Although *Labyrinth* didn't achieve the commercial success of later Lucasfilm Games titles, it was a vital project that proved the studio's creative ambitions. For David Fox, it was a chance to blend his passion for storytelling with his technical expertise, crafting an experience that felt ahead of its time.

For Lucasfilm Games, it was a spark that ignited an era of revolutionary adventure games!

Game details:	
Year of Release	1986
Systems:	C64, Apple II
Genre:	Adventure
Developer:	David Fox / Lucasfilm Games
Publisher:	Activision

THE LEGEND OF ZELDA

Shigeru Miyamoto and Takashi Tezuka, the creative forces behind Nintendo's most iconic games, embarked on an ambitious project in 1984 to create something entirely new for the Famicom Disk System. Following the massive success of *Super Mario Bros.*, Miyamoto wanted to design a game that emphasized exploration, discovery, and player freedom. The result was *The Legend of Zelda*, released on February 21, 1986, in Japan as a launch title for the Famicom Disk System and later on the NES in 1987. It became one of Nintendo's most innovative and influential titles, redefining what video games could be.

Miyamoto's inspiration for *The Legend of Zelda* came from his childhood memories of exploring forests, caves, and hidden trails near his hometown in Kyoto. He wanted players to feel that same sense of wonder, crafting a game world that encouraged curiosity and rewarded experimentation. Alongside Tezuka and composer Koji

Kondo, Miyamoto created the land of Hyrule—a vast, mysterious place filled with dungeons, treasures, enemies, and secrets. Players took on the role of Link, a brave hero tasked with recovering the eight pieces of the Triforce of Wisdom to rescue Princess Zelda from the villainous Ganon.



What made *The Legend of Zelda* so groundbreaking was its open-ended gameplay. Unlike most games of the time, which followed rigid level structures, *Zelda* allowed players to explore its expansive world freely. Dungeons could be tackled in various orders, and observant players could discover powerful items like the boomerang or magical sword early in the game. This sense of freedom and discovery was a revelation in 1986, offering players an unparalleled level of agency. Additionally, the game featured a persistent world—a technical achievement made possible by the Famicom Disk System's save functionality.

When the game was released internationally on the NES, it introduced battery-backed saves, a first for the platform.

The game’s visuals and audio were designed to immerse players in Hyrule's magical world. The graphics, though simple by modern standards, effectively conveyed the sense of adventure and danger, with a top-down perspective that gave players a clear view of their surroundings. Koji Kondo’s iconic music, including the unforgettable overworld theme, added depth and emotion, setting a new standard for video game soundtracks.

At its core, *The Legend of Zelda* was a game of discovery. Players explored Hyrule’s overworld, searching for hidden caves, secret passages, and unmarked treasures. Cryptic clues from NPCs and environmental details encouraged players to experiment, rewarding persistence and ingenuity.

The impact of *The Legend of Zelda* on Nintendo and the gaming industry was immense. It showcased the Famicom Disk System and NES as platforms capable of delivering

deep, immersive experiences. The game became a critical and commercial success, significantly boosting Nintendo's reputation and solidifying its dominance in the console wars against competitors.



The Legend of Zelda remains a timeless classic, celebrated for its pioneering design and sense of wonder. It laid the foundation for an enduring series and proved that video games could evoke the same sense of awe and adventure as the best works of literature or film. For Nintendo, it wasn’t just a success—it was a defining moment that cemented its place as an industry leader.

Game details:	
Year of Release	1986
Systems:	NES, Famicom
Genre:	Action - Adventure
Developer:	Shigeru Miyamoto
Publisher:	Nintendo

Out Run

Out Run is a classic arcade racing video game developed by SEGA and released in 1986. Directed by Yu Suzuki, *Out Run* became one of SEGA's most iconic titles and a significant milestone in the evolution of racing games. The game's development was groundbreaking for its time, offering players a thrilling, fast-paced experience with a sense of freedom and immersion that was largely unprecedented.

Set in a variety of picturesque locations, *Out Run* featured a unique gameplay mechanic: players could choose their route through the game's stages, making each playthrough different. This branching path system, which allowed players to select from multiple routes after each checkpoint, was innovative and gave the game a sense of non-linearity that set it apart from other racing games of the time. The game's objective was simple—race to the end

of each stage as quickly as possible while avoiding traffic and obstacles, and reach the goal before time ran out.



The graphics of *Out Run* were a significant leap forward in the arcade gaming industry. Utilizing advanced sprite-based graphics, the game depicted lush, colorful environments, including highways that stretched through forests, deserts, and coastal roads. The game's signature "tropical" aesthetic, with a convertible car and vibrant backdrops, contributed to its distinctive style and appeal. The arcade machine featured a revolutionary cabinet design, with a steering wheel, gear shift, and foot pedals for an immersive experience, and it became one of the most recognizable arcade machines of the era.

One of *Out Run*'s standout features was its soundtrack, composed by Hiroshi Kawaguchi. The game featured an

upbeat and catchy soundtrack with songs like “Magical Sound Shower” and “Passing Breeze,” which became iconic in gaming music. The music helped enhance the game's feel of freedom and excitement, reinforcing the sense of cruising along scenic roads at high speeds.

Out Run also featured a high level of interactivity, allowing players to adjust the car’s transmission and navigate the roads with precision. The game’s controls, which included a steering wheel and pedals, were ahead of their time, offering a more immersive and dynamic driving experience compared to other arcade racers.

The game’s impact on the gaming industry was far-reaching. It was not only a commercial success but also set the standard for future arcade racing games. *Out Run*’s combination of branching paths, immersive graphics, and engaging gameplay mechanics influenced countless racing games that followed. It also became one of SEGA’s

flagship titles, boosting the company's profile in the arcade and console markets. The game’s success led to numerous ports and sequels, ensuring that *Out Run* remains one of the best racing games in history.

In addition to its influence on gaming design, *Out Run* is often regarded as a pioneer of the arcade racing genre. Its technical achievements, including the use of a pseudo-3D engine, paved the way for more sophisticated arcade racers. The game's iconic status in the racing genre is a testament to its enduring legacy.



Game details:	
Year of Release	1986
Systems:	Arcade, Sega Master System (1987)
Genre:	Racing
Developer:	Yu Suzuki
Publisher:	Sega

METROID

The original *Metroid*, developed by Nintendo R&D1 and released in 1986 for the Famicom Disk System in Japan and the Nintendo Entertainment System (NES) in North America, was a groundbreaking action-adventure game that redefined the gaming landscape. Designed by Yoshio Sakamoto, Gunpei Yokoi, and Makoto Kano, *Metroid* combined platforming, exploration, and atmospheric storytelling to create a unique gaming experience. Its blend of nonlinear gameplay, dark sci-fi themes, and innovative mechanics made it a classic that laid the foundation for the "Metroidvania" genre.

Gameplay and Mechanics: *Metroid*

introduced players to a vast, interconnected world on the planet Zebes. The game eschewed traditional level-based progression in favor of a sprawling, open-ended map filled with secret areas, hidden power-ups, and challenging

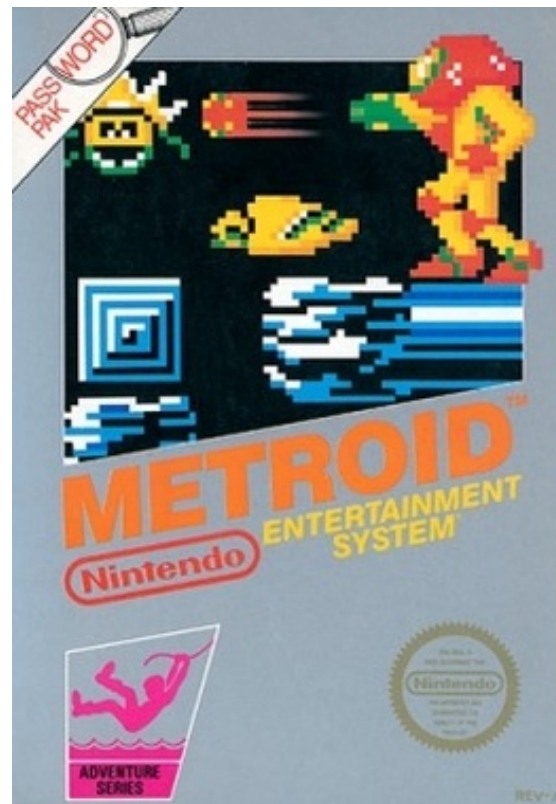
enemies. Players assumed the role of Samus Aran, a bounty hunter tasked with infiltrating the lair of Space

Pirates and destroying the dangerous parasitic organisms known as Metroids.

One of the game's defining features was its emphasis on exploration and power progression. Players started with minimal abilities but could find upgrades, such as the Morph Ball (allowing Samus to roll into tight spaces), Missile Launcher, and Ice Beam, which were critical for accessing new areas and overcoming obstacles. This sense of progression was deeply satisfying, as it gave players a growing sense of empowerment and encouraged backtracking to uncover

previously inaccessible locations.

Comba2 was simple yet engaging, with Samus using her Arm Cannon to defeat a variety of enemies, ranging from



small creatures to large bosses like Kraid and Ridley. The final confrontation with Mother Brain, the leader of the Space Pirates, was a high-stakes battle that cemented the game's tension-filled atmosphere.

Metroid was notable for its dark, lonely atmosphere, heavily inspired by the *Alien* film series. The game featured little direct narrative, instead relying on its oppressive environments and eerie music to convey the story. Zebes felt alive with danger, as its labyrinthine corridors, hostile creatures, and foreboding areas created an unparalleled sense of isolation.

The game's most iconic moment came at the end, when players discovered that Samus Aran was a woman—a groundbreaking revelation for the time, challenging gender stereotypes in gaming and establishing her as one of the first major female protagonists in video games.

For its time, *Metroid* was visually impressive. The game's 8-bit graphics brought Zebes to life with distinct areas like

the fiery Norfair, the organic Brinstar, and the mechanical Tourian. Each zone had its own unique visual identity, helping players navigate the interconnected world.

The soundtrack, composed by Hirokazu Tanaka, was a masterpiece of atmospheric sound design.

Metroid was a commercial success and received widespread critical acclaim, but its true legacy lies in the genre it helped pioneer. Alongside *Castlevania: Symphony*

of the Night, it gave rise to the "Metroidvania" subgenre, characterized by open-ended explorationinfluenced



Game details:	
Year of Release	1986
Systems:	NES
Genre:	Action - Adventure
Developer:	-
Publisher:	Nintendo

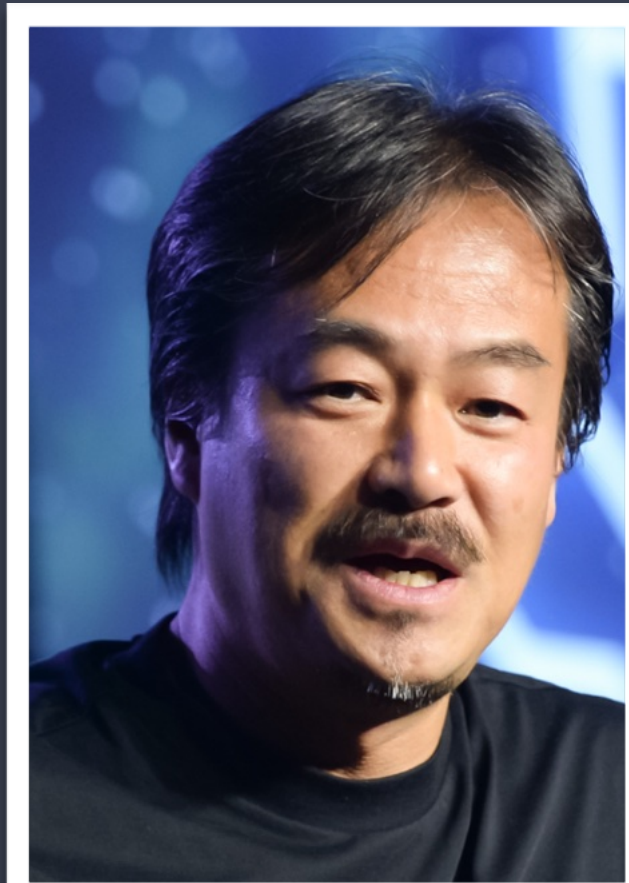
Square's Last Hope

Masafumi Miyamoto, the son of a wealthy construction magnate, had a vision in the early 1980s that went beyond concrete and steel. Seeing the burgeoning potential of computer software, he founded Square Co., Ltd. in September 1983 as a division of his father's company, Den-Yu-Sha. Originally, Square wasn't a game development studio but a small team of software developers dabbling in various projects. However, Miyamoto noticed something about the chaotic, piecemeal way games were being developed at the time—usually by one or two programmers handling everything from design to coding. He believed that applying a more structured, team-based approach could elevate game development into a serious business.

The first few years were humble, with Square creating games for the fledgling Japanese PC market, including titles for the NEC PC-8801 and FM-7. While they showed promise, none were groundbreaking. Then, in 1986, a major shift occurred. Seeking to capitalize on the rapidly growing popularity of Nintendo's Famicom (NES outside

Japan), Square split from Den-Yu-Sha and became its own independent company. That year, they released *The Death Trap* and *Will: The Death Trap II* for PCs—interactive adventure games that hinted at Square's potential. But despite these modest successes, the company was struggling. By 1987, it was facing financial difficulties, and Miyamoto needed a hit to keep his dream alive.

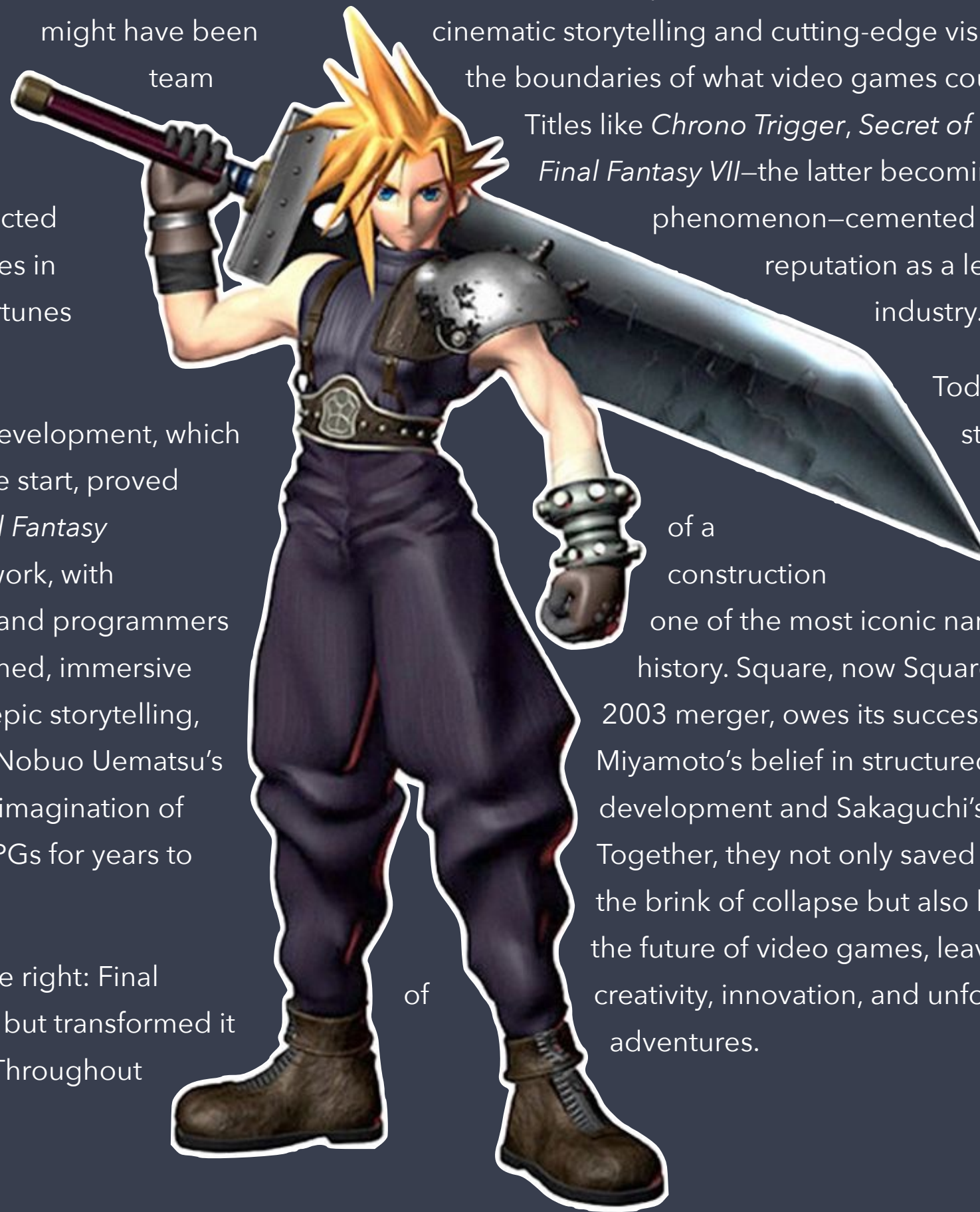
Enter a young designer named Hironobu Sakaguchi (image above). A passionate creative who had joined Square earlier in its journey, Sakaguchi pitched an ambitious fantasy RPG to be developed for the Famicom. It was a bold move—RPGs were a niche genre at the time,



and Square had little experience in creating them. Naming it *Final Fantasy* as a nod to what their last project if it failed, the poured everything they had into the game. Released in December 1987, *Final Fantasy* was an unexpected success, selling over 400,000 copies in Japan and revitalizing Square's fortunes almost overnight.

Square's structured approach to development, which Miyamoto had envisioned from the start, proved crucial to the game's success. *Final Fantasy* showcased the strengths of teamwork, with dedicated designers, composers, and programmers working together to create a polished, immersive experience. The game's blend of epic storytelling, strategic turn-based combat, and Nobuo Uematsu's unforgettable music captured the imagination of players and set the standard for RPGs for years to come.

The success of *Final Fantasy* (image right: *Final Fantasy VII*) not only saved Square but transformed it into a powerhouse of innovation. Throughout



the 1990s, the company became synonymous with cinematic storytelling and cutting-edge visuals, pushing the boundaries of what video games could achieve. Titles like *Chrono Trigger*, *Secret of Mana*, and *Final Fantasy VII*—the latter becoming a global phenomenon—cemented Square's reputation as a leader in the industry.

Today, what started as a small division of a construction company is one of the most iconic names in gaming history. Square, now Square Enix after a 2003 merger, owes its success to Miyamoto's belief in structured game development and Sakaguchi's bold vision. Together, they not only saved a company on the brink of collapse but also helped shape the future of video games, leaving a legacy of creativity, innovation, and unforgettable adventures.

FINAL FANTASY.

ファイナルファンタジー

The originality of the first *Final Fantasy* lay in its ambitious design and innovative features, which pushed the boundaries of what a role-playing game (RPG) could achieve on a home console. While it was inspired by earlier RPGs such as *Dragon Quest* and Western tabletop games like *Dungeons & Dragons*, *Final Fantasy* introduced several groundbreaking elements that set it apart. One of its most notable innovations was the ability for players to create and customize their party from six distinct character classes, each with unique strengths, weaknesses, and progression paths. This system allowed for a level of strategic planning and replayability that was rare at the time. Players could mix and match classes, creating entirely different experiences based on their choices, whether they preferred a balanced party or a challenging, specialized lineup.



Another pioneering aspect of *Final Fantasy* was its narrative depth. While many RPGs of the era focused on simple rescue missions or treasure hunts, *Final Fantasy* wove a complex, multilayered story about a world in peril, corrupted elements, and a cyclical time loop. The inclusion of themes like prophecy, betrayal, and redemption gave the game a sense of gravitas and immersion that resonated with players. The storytelling was further supported by detailed lore and a rich world map filled with unique towns, NPCs, and side quests, offering a sense of exploration and discovery.

Mechanically, the game introduced a dynamic turn-based battle system that required players to carefully manage resources such as magic points, healing items, and the strengths of each character class. The concept of "active planning" during battles—choosing which enemies to

target, balancing offense and defense, and managing limited inventory—added a layer of tactical complexity. Additionally, *Final Fantasy* introduced a progression system where certain character classes could be upgraded into more powerful versions, rewarding players for advancing in the game.

The importance of *Final Fantasy* as a role-playing game stems from its ability to set a new standard for the genre on consoles. At the time, most RPGs were either limited by technological constraints or overly niche, appealing to a small subset of players. *Final Fantasy* managed to combine accessibility with depth, creating a game that appealed to both casual players and hardcore RPG enthusiasts. Its focus on an epic, quest-driven narrative combined with an innovative class system influenced the design of future RPGs, setting the template for the genre's evolution.



Moreover, *Final Fantasy* demonstrated the potential of video games as a storytelling medium. By blending cinematic moments, a sweeping score, and intricate gameplay mechanics, it created a cohesive experience that was both emotionally engaging and intellectually challenging. This blend of innovation and ambition not only saved Square from financial ruin but also established RPGs as a major force in gaming, inspiring a legacy of sequels, spinoffs, and countless other RPG titles that continue to shape the industry.

Game details:	
Year of Release	1987
Systems:	NES
Genre:	Role Playing Game
Developer:	Hironobu Sakaguchi
Publisher:	Square

SCUMM

Ron Gilbert was preparing to create the first truly graphical adventure game for Lucasfilm Games under its newly established name. He knew he wanted to develop something unique and user-friendly, but the limitations of existing games in the market left him frustrated. Another member of the Lucasfilm Games team, Gary Winnick, shared Ron's passion and vision. They both realized that to create the game they envisioned, they first needed to develop the tools that would make it possible.

After settling on the idea of a graphic adventure game with a strong emphasis on humor, they set out to build a game engine in 1987. This engine would allow them to rapidly create scenes, characters, and dialogues, cutting development time significantly compared to traditional methods. Once they decided on the game's concept—drawing inspiration from low-budget horror movies featuring mad scientists and creepy mansions—they came up with a name for their engine: Script Creation Utility for Maniac Mansion, or SCUMM, Maniac Mansion being their first adventure game that was completely graphical!



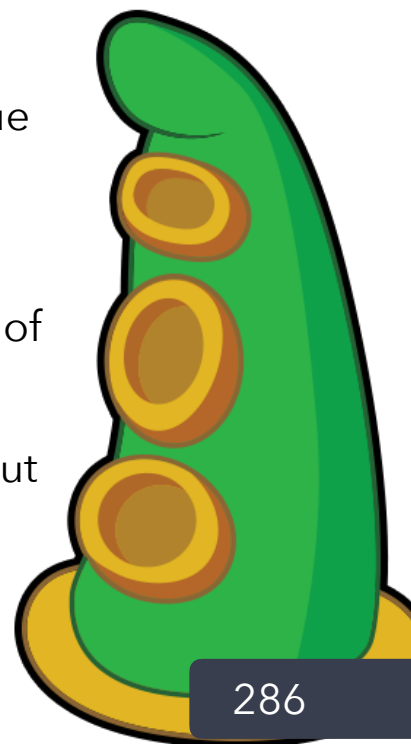
Maniac Mansion

Maniac Mansion, developed by Ron Gilbert and Gary Winnick at Lucasfilm Games (later LucasArts), was released in 1987 and revolutionized the adventure game genre. Gilbert and Winnick envisioned creating a game that combined the narrative depth of graphic adventures with a streamlined interface to eliminate the frustrations of traditional text parsers. To achieve this, they developed the SCUMM engine (Script Creation Utility for Maniac Mansion), a groundbreaking tool that allowed players to interact with the game world using a point-and-click interface. This system not only simplified gameplay but also enabled more intuitive exploration and puzzle-solving, paving the way for the evolution of graphic adventures. The developers were inspired by their love for campy horror and science fiction



B-movies, setting the game in a quirky, eerie mansion with a comedic twist.

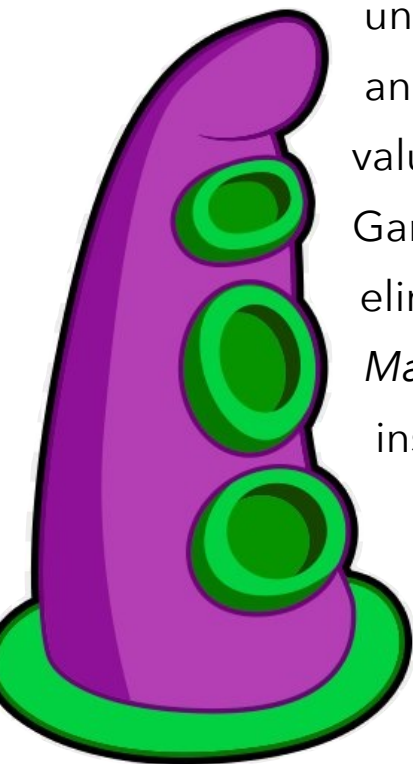
The story of *Maniac Mansion* follows Dave Miller, a teenager attempting to rescue his girlfriend, Sandy, who has been kidnapped by the mad scientist Dr. Fred Edison. Dr. Fred has been brainwashed by a sentient purple meteor into conducting bizarre experiments. Players control Dave and two other teenagers chosen from a roster of seven characters, each with unique skills that influence how puzzles can be solved. This character system added replayability, as different combinations of teens opened up alternative solutions and endings. The humor in the game was a standout feature, characterized by absurd situations, witty dialogue, and a satirical take on horror



tropes. From the tentacle-turned-jazz-musician to the hilariously dysfunctional Edison family, *Maniac Mansion* oozed charm and self-awareness.

Maniac Mansion featured a unique mechanic where players could choose two characters from a roster of seven to join Dave, each with unique skills impacting puzzle solutions. However, certain combinations made the game impossible to complete, as some puzzles required specific abilities—like Bernard fixing electronics or Syd and Razor using music—that not all characters possessed. This design

flaw, while adding replayability, frustrated players who unknowingly selected an incompatible team and had to restart. The issue served as a valuable lesson for developers Ron Gilbert and Gary Winnick, leading future Lucasfilm Games to eliminate unwinnable states, ensuring *Maniac Mansion* became both a groundbreaking and instructive milestone in game design.



The impact of *Maniac Mansion* was profound, both in terms of gameplay innovation and cultural influence. It popularized the point-and-click adventure genre, establishing LucasArts as a leader in narrative-driven games. The SCUMM engine became the foundation for a

string of iconic titles, including *The Secret of Monkey Island* and *Day of the Tentacle*. Additionally, the game’s unique humor and focus on player choice left a lasting impression on the industry, inspiring countless developers and ensuring its legacy as one of the most influential adventure games of all time.



Game details:	
Year of Release	1987
Systems:	C64, PC, Atari ST
Genre:	Adventure
Developer:	Ron Gilbert, Gary Winnic
Publisher:	Lucasfilm Games

Quest for Glory

Originally titled *Hero's Quest: So You Want to Be a Hero*, *Quest for Glory* was designed by Lori and Corey Cole and released by Sierra On-Line in 1989.

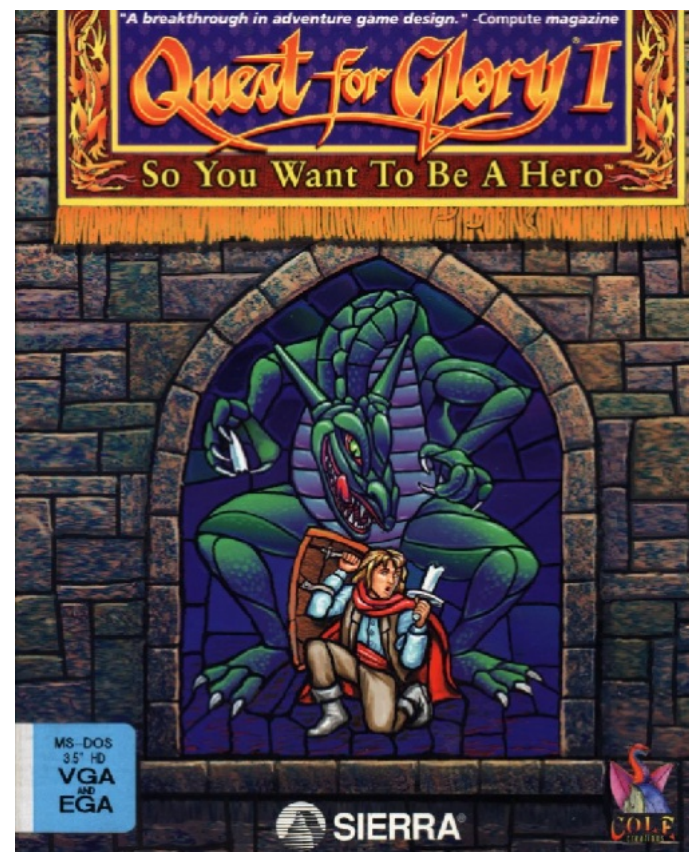
Drawing inspiration from their love of *Dungeons & Dragons* and tabletop role-playing games, the Coles aimed to create a hybrid experience that merged the puzzle-driven gameplay of Sierra adventure games with the character progression, combat, and stat mechanics of RPGs. Unlike traditional Sierra games, *Quest for Glory* allowed players to choose from three distinct character classes—Fighter, Magic User, or Thief—each with unique abilities and puzzle-solving approaches. This class system encouraged replayability, as different paths and solutions were available depending on the character's skills. The game also featured an innovative stat-driven progression system,

where players could improve their character's attributes by practicing skills, further enhancing the RPG experience.

Real-time combat mechanics added an action element, making the gameplay dynamic and engaging.

The game's story centered on an aspiring hero arriving in the valley of Spielburg, where they were tasked with saving the land from threats like brigands and the evil sorceress Baba Yaga, while helping a colorful cast of villagers. The storytelling was rich, blending epic fantasy with humor and charm. The Coles drew on folk tales and legends, such as the inclusion of Baba Yaga's chicken-legged hut and a kobold

sorcerer guarding treasure, to add depth and familiarity to the world. Unlike many other Sierra titles, *Quest for Glory* minimized harsh punishments for failure, allowing players to experiment and learn without constant frustration.



Visually, the game stood out for its colorful and detailed EGA graphics, which brought the fantasy world of Spielberg to life. The environments, from the snowy mountain peaks to lush forests and eerie caves, were carefully crafted to evoke a magical, storybook aesthetic. A groundbreaking feature for the time was the day/night cycle, which added a new layer of realism and strategy to gameplay. Certain events, characters, and puzzles only appeared at specific times of the day, encouraging players to plan their actions. For instance, the Thief class could sneak into homes or shops at night, while monsters became more dangerous after dark, adding both challenge and immersion.

The sound and music of *Quest for Glory* were equally impressive for its era. The game featured a whimsical and atmospheric MIDI soundtrack that changed based on the location or situation, enhancing the storytelling and mood. The Coles also incorporated humorous sound effects, such as the cheerful jingles for skill improvement, which added to the game’s charm and lighthearted tone.



Despite its innovation, *Quest for Glory* almost didn’t get published. Sierra’s management was skeptical about its genre-blending concept and initially planned to cancel it. However, Chris Williams, the son of Sierra founders Ken

and Roberta Williams, played an early version and loved it. His enthusiasm convinced the company to move forward with the project. The gamble paid off, as the game became a critical and financial success, selling well and earning praise for its originality.

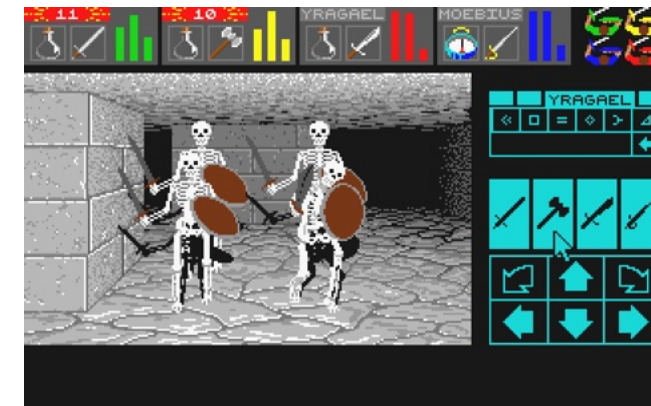
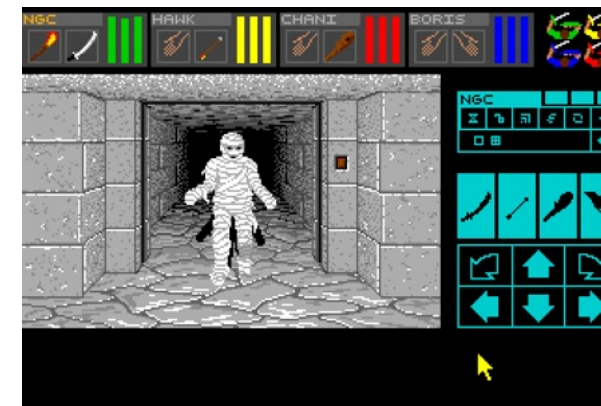
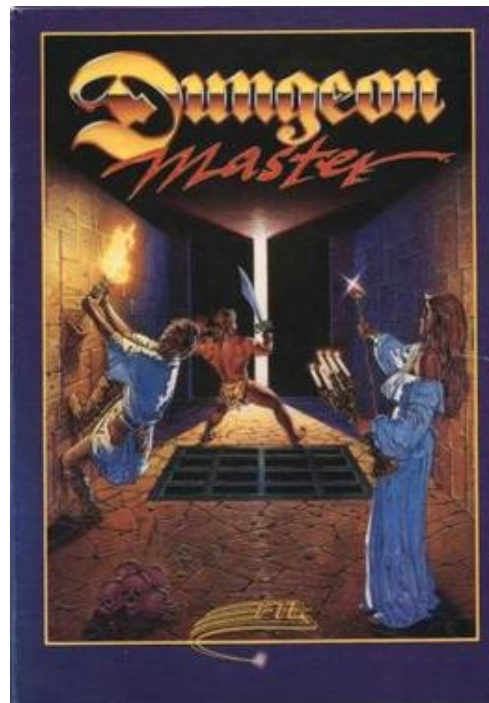
Its success spawned four sequels, each set in a new region inspired by global folklore and mythology.

Game details:	
Year of Release	1987
Systems:	PC, Atari ST
Genre:	Action - Adventure - RPG
Developer:	Lori & Corey Cole
Publisher:	Sierra On-Line

Dungeon Master

The era of computer-based RPGs can be divided into two distinct periods: BD (Before Dungeon Master) and AD (After Dungeon Master). Such was the impact of the breathtaking pseudo-3D role-playing game unleashed—initially—on the Atari ST in 1987 by FTL Games (Faster Than Light). *Dungeon Master* was a revolutionary title that redefined what RPGs could achieve in terms of immersion, interactivity, and real-time gameplay mechanics, making it a landmark in gaming history.

Before *Dungeon Master*, computer RPGs were primarily inspired by tabletop experiences, with games like *Ultima* and *Wizardry* employing grid-based movement and turn-based combat. These games emphasized tactical planning and a slow, deliberate pace, which often kept the player at arm's length from the action. *Dungeon Master* shattered these conventions by introducing a real-time gameplay system



and a seamless, first-person perspective. The game employed a pseudo-3D engine that allowed players to navigate dungeons as if they were truly inside them, moving smoothly from one tile to the next and interacting with objects in the environment. This innovation created a level of immersion that was unheard of at the time and became the blueprint for many RPGs and dungeon crawlers to follow.

The game began with a mysterious, atmospheric setup: the player, embodying an unseen entity, had to resurrect a party of adventurers from four pools of champions, each with unique abilities and stats. The objective was to guide them through a sprawling, labyrinthine dungeon to defeat the dark wizard Lord Chaos. Players managed the party's health, stamina, and mana while solving intricate puzzles, defeating monsters, and collecting equipment. The real-time combat was a significant departure from the turn-based systems of its predecessors, requiring quick reflexes

and strategic planning. Players could dodge enemy attacks, cast spells by combining rune symbols, and position their party tactically to gain an advantage.

Dungeon Master also introduced groundbreaking mechanics, such as environmental interaction. Players could pick up and throw objects, flip switches, and even solve puzzles by placing items on pressure plates, giving the game a tactile and intuitive feel. The game's puzzles were fiendishly clever, blending logic and spatial reasoning with exploration and experimentation. The atmosphere was enhanced by its dynamic lighting system, where torches and magical light spells were essential to illuminating the dark corridors, adding a layer of tension and urgency to exploration.

Visually, *Dungeon Master* pushed the boundaries of what the Atari ST and later platforms like the Amiga and PC could achieve. Its sprite-based graphics and detailed textures created a world that felt alive and foreboding, with enemies that moved and attacked in real time, further

immersing players. The audio also played a crucial role: the game featured an ambient soundscape of dripping water, growling monsters, and clinking chains, heightening the sense of danger and suspense.



What makes *Dungeon Master* so significant is not just its technical achievements but its ability to engage players on a visceral level. It transformed the RPG genre from a cerebral, abstract experience into something physical and immediate, bridging the gap between the player and the game world. It set a new standard for interactivity, atmosphere, and immersion, cementing its legacy as one of the most innovative and influential RPGs ever made.

Game details:	
Year of Release	1987
Systems:	Atari ST, Amiga
Genre:	3D Role Playing Game
Developer:	-
Publisher:	FTL Games

Captain Blood (by Francois Lionet)

In 1987, the year I wrote STOS Basic (see "STOS"), I embarked on one of the most challenging yet rewarding projects of my career: adapting *Captain Blood* for the Commodore 64 (CBM64) and IBM PC. My passion for programming games and a little bit of luck landed me this opportunity with Ere Informatique, a decision that would shape my future in the gaming industry.

The project began shortly after I moved to Maison Alfort, near Paris, to chase my dream of working in video games. At the time, I was collaborating with JAWX and earning a modest income from *Chicken Chase*. Through JAWX, I met Constantin Sotiropoulos, and we started working on the STOS project. But that wasn't enough to sustain me, so I applied to Ere Informatique to adapt *Captain Blood*, originally created on the Atari ST. Despite never having programmed on a PC or

the 8086 processor, I was entrusted with the task—a testament to the trust and freedom that characterized the industry back then.

At Ere Informatique, I met the creative team behind

Captain Blood. Philippe Ulrich, the visionary scenarist, and Didier Bouchon, the genius programmer and graphic artist, were the heart of the project. Didier's hand-written 68000 machine code amazed me—it was a work of art in itself. His innovative use of fractals to generate 65,536 unique planets in the game was

groundbreaking. A single number served as a seed for the random generator, creating planets consistently without consuming memory. This ingenious technique gave *Captain Blood* its immense scope and surreal beauty.



Despite these obstacles, I succeeded in creating functional, albeit imperfect, versions of *Captain Blood* for both platforms. Beta testing was a whirlwind of bug reports and last-minute fixes, but the satisfaction of seeing the final product outweighed the stress.

Looking back, 1987 was the foundation of my career. Alongside *Captain Blood*, I worked on *Chicken Chase* for CPC 464 and wrote *Le Jeu du Roy* for the Thomson To7. I also met lifelong collaborators like Yves Lamoureux, who would later co-create *Klik & Play* and *Fusion* with me. Those early days of game development were simpler yet filled with boundless creativity and innovation—a magical time that remains unmatched in my memory.



The Music of Captain Blood

The game featured an excerpt from track **"Ethnicolor I"** of Jean-Michel Jarre, from the album **Zoolook** (1984). This piece was used as the game's theme music, enhancing its atmospheric, futuristic vibe. The developers selected Jarre's music because of its innovative and electronic style, which perfectly matched the sci-fi and alien ambiance of *Captain Blood*. The track was adapted and implemented in the game by the sound team, tailored for the hardware limitations of platforms like the Atari ST and Amiga.

This collaboration wasn't a formal commission but rather a creative use of existing music, reflecting the experimental and innovative nature of video games during the 1980s.

Game details:

Year of Release	1988
Systems:	Atari ST, Amiga, C64
Genre:	Sci-fi Adventure
Developer:	Didier Bouchon, Philippe Ulrich, Francois Lionet (C64 port)
Publisher:	Infogrames

Mega Man 2

Mega Man 2, released in 1988 by Capcom, was created under the direction of Akira Kitamura, with significant contributions from artist Keiji Inafune. The game was a follow-up to the original *Mega Man* (1987) and came about largely due to Kitamura's and the team's desire to refine and expand upon the ideas of the first game, which had moderate success but untapped potential. The inspiration for *Mega Man 2* was rooted in Japanese anime and manga, with its colorful characters and robot-centric narrative reflecting popular themes of the era. The development team, working in their spare time outside regular projects, poured their passion into creating a polished and innovative action-platformer, determined to push the limits of the Nintendo Entertainment System (NES).



Mega Man 2 belongs to the action-platformer genre, with gameplay revolving around precise platforming, fast-paced combat, and a unique level structure. The story follows the heroic robot Mega Man as he faces off against the evil Dr. Wily, who has constructed eight new Robot Masters to dominate the world. Players must defeat these bosses in their respective stages, each granting Mega Man a unique weapon upon defeat, which can be used strategically to exploit the weaknesses of other bosses. This rock-paper-scissors mechanic became a defining feature of the series.

The controls of *Mega Man 2* were intuitive yet precise, allowing players to run, jump, shoot, and switch between acquired weapons seamlessly. This responsiveness was critical, as the game demanded both quick reflexes and strategic thinking. The aim was to

navigate challenging levels filled with enemies and hazards, culminating in intense boss battles. The graphics were a major step forward for the NES, featuring vibrant, detailed environments and character sprites. Each level had a distinct theme and aesthetic, from the fiery depths of Heat Man's stage to the industrial maze of Metal Man's level, showcasing impressive use of color and design for the hardware.

The audio, composed by Takashi Tateishi and featuring sound effects by Manami Matsumae, was equally iconic. The soundtrack, with its energetic, catchy chiptune melodies, perfectly complemented the action-packed gameplay. Tracks like the theme of Dr. Wily's Castle became legendary, cementing the game's place in gaming history. The audio design also included satisfying sound effects for actions like firing weapons, jumping, and enemy destruction, enhancing the gameplay experience.



Mega Man 2 was a critical and commercial success, far surpassing its predecessor. It sold over 1.5 million copies worldwide and received widespread acclaim for its challenging yet fair gameplay, innovative boss mechanics, and polished presentation. It set a new benchmark for platformers and solidified *Mega Man* as one of Capcom's flagship franchises. To this day, it is regarded as one of the greatest video games of all time, influencing countless titles in the action-platformer genre and earning a devoted fanbase that spans generations.

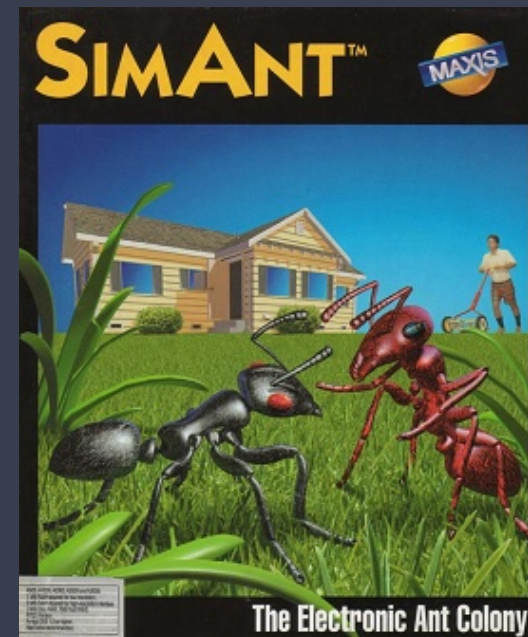
Game details:	
Year of Release	1988
Systems:	NES
Genre:	Action - Platformer
Developer:	Akira Kitamura
Publisher:	Capcom

Maxis

Will Wright and Jeff Braun were visionaries who wanted not just to create games, but to create worlds. In 1987, they founded Maxis in Orinda, California, driven by a shared ambition to push the boundaries of simulation-based gaming. Wright, with his background in robotics and architecture, was fascinated by systems thinking and emergent gameplay, while Braun, a savvy businessman, provided the funding and strategic direction to turn their shared vision into reality. Together, they set out to create games that empowered players to build, experiment, and explore virtual systems in open-ended ways, breaking away from the rigid structures of traditional game design.



The idea for Maxis took root in Wright's early work on *Raid on Bungeling Bay* (1984), during which he realized that the map-making tools he had developed for the game could form the foundation of a city-building simulation. This



concept became *SimCity*, but it was initially rejected by multiple publishers who found its lack of conventional goals too risky. Undeterred, Wright partnered with Braun, who saw the game's potential, and in 1989, *SimCity* was released. The game's innovative design, allowing players to create and manage cities while solving challenges

like disasters, pollution, and budgeting, became an instant success, cementing Maxis as a leader in the emerging simulation genre.

SIM CITY™

Will Wright's idea for *SimCity* emerged while he was developing his earlier game, *Raid on Bungeling Bay* (1984).

As he built the maps for the game, Wright discovered he enjoyed designing the cities more than the actual gameplay. This sparked the idea for a game centered around creating and managing a city. His vision was to give players the freedom to design and experiment with a living system, allowing them to understand the interconnectedness of urban planning, resource management, and societal growth. Unlike traditional games with clear goals or victory conditions, Wright envisioned a game that focused on creativity, experimentation, and open-ended play, where players could build their own cities and see how they evolved over time.



Creating a city-building video game was a groundbreaking concept in the 1980s, and Wright faced significant

challenges in its development. The biggest hurdle was convincing publishers that a game without a clear win/lose condition could be engaging. Many dismissed the concept as too unconventional, doubting its marketability. Another challenge was technical: simulating a dynamic city required balancing numerous systems, including population growth, transportation, economy, and disasters, all while ensuring the game remained accessible and intuitive. Wright used a grid-based system to simplify city design and employed algorithms to model complex behaviors, such as traffic congestion and pollution. He also

created a user-friendly interface that allowed players to easily lay down roads, zones, and utilities while monitoring

their city’s performance through visual feedback and statistics.

SimCity offered players a sandbox experience where they could build a city from scratch, zoning areas for residential, commercial, and industrial use while managing infrastructure like roads, power plants, and public services. Players had to balance their budget, address citizen needs, and deal with challenges like crime, natural disasters, and environmental degradation. The game encouraged experimentation, rewarding creativity and strategic thinking while avoiding punitive mechanics. Its scope was impressive for the time, simulating the complexities of urban life while giving players the tools to shape their city as they saw fit.

When *SimCity* was released in 1989, it was genre-defining. It pioneered the simulation genre, demonstrating that games could be about creation and exploration rather than just competition or combat. Its innovative mechanics and open-ended gameplay influenced countless games that followed, from city-builders to management sims. By

empowering players to act as city planners and problem solvers, *SimCity* not only entertained but also educated, helping players appreciate the challenges of urban development and the ripple effects of their decisions. The

game’s success established Will Wright as a visionary designer and opened the door for future Maxis titles like *SimEarth*, *SimAnt*, and eventually *The Sims*. Moreover, it created a whole new series of games that kept evolving with time, adding more features and even turning the game into a much more realistic scenario of

running and developing an actual city, albeit to the detriment of the (easy to grasp) gameplay.



Game details:	
Year of Release	1989
Systems:	PC, Atari ST, Amiga
Genre:	City Builder
Developer:	Will Wright
Publisher:	Maxis

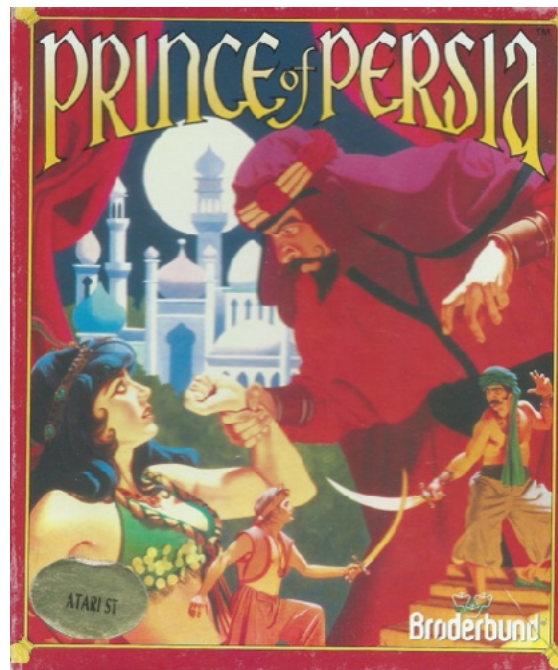
PRINCE OF PERSIA

Prince of Persia is considered a classic game, one that took the whole world by storm when it was first released, due to its simple controls yet difficult gameplay, with its most notable characteristic, its fluid animation.

The development of *Prince of Persia* was a challenging and groundbreaking process that stretched over four years, primarily due to the ambitious vision of its creator, Jordan Mechner. Having already developed the successful *Karateka* in 1984, Mechner set out to create a platformer that would not only offer engaging gameplay but also introduce cinematic storytelling and lifelike character animation—something unheard of at the time.

The rotoscoping technique he used to animate the Prince's fluid movements was innovative but time-consuming. Mechner filmed his younger brother performing various actions, such as running, jumping, and climbing, and then painstakingly traced the footage frame by frame. This

process pushed the technical limits of the Apple II, the game's original development platform, which could only display six colors and had limited memory and processing power.



One major technical difficulty was optimizing the game for smooth performance. The Apple II's hardware constraints meant that every byte of memory had to be meticulously managed. Mechner struggled with fitting the complex animations and level designs into the system's 48KB of RAM. The game's time-limited structure, where players had one hour to complete the game, was not just a gameplay mechanic but also a clever workaround for

these limitations. Additionally, designing the game's iconic traps and combat sequences required extensive trial and error to balance difficulty and fairness.

The initial market reception of *Prince of Persia* was lukewarm. Released in 1989 for the Apple II, the game struggled to gain traction as the platform was already in decline, overshadowed by newer systems like the IBM PC and Commodore Amiga. However, as the game was ported to other platforms—such as the Amiga, Atari ST, IBM PC, and eventually consoles like the NES, Sega Genesis, and SNES—its reputation grew. Players and critics alike praised its innovative gameplay, lifelike animation, and gripping story. By the early 1990s, *Prince of Persia* had become a sleeper hit, establishing itself as a classic.



The legacy of *Prince of Persia* is immense, influencing the design of cinematic platformers and action-adventure games for decades. Its groundbreaking animation and narrative focus paved the way for titles like *Another World* (1991) and *Tomb Raider* (1996). The game spawned numerous sequels, beginning with *Prince of Persia 2: The Shadow and the Flame* (1993), which expanded on the original’s story and introduced improved graphics and gameplay mechanics. The series underwent a significant

revival with *Prince of Persia: The Sands of Time* in 2003, a reimagining that combined platforming, combat, and time-manipulation mechanics, and was met with critical and commercial success. This led to a trilogy of games, spinoffs, remakes and even a movie!

Despite its ups and downs over the years, *Prince of Persia* remains a landmark in video game history. Its influence can be seen in modern franchises like *Assassin’s Creed*—which was initially conceived as a spin-off of *Prince of Persia*—and in the ongoing popularity of narrative-driven action-adventure games.

Game details:	
Year of Release	1989
Systems:	PC, Apple II, C64
Genre:	Action Adventure
Developer:	Jordan Mechner
Publisher:	Broderbund

Phantasy Star II

Phantasy Star II, developed by Sega and released in 1989, was a groundbreaking role-playing game (RPG) that set new standards for the genre. Created by a team led by Yuji Naka and Rieko Kodama, the game drew inspiration from both Western science fiction and Japanese mythology, blending futuristic settings with fantasy elements. Its development began as a sequel to the original *Phantasy Star* (1987) and was designed to push the limits of the Sega Genesis/Mega Drive, which was the game's initial platform. This made it one of the earliest RPGs for 16-bit consoles. A notable feature of *Phantasy Star II* was its use of internet connectivity, a rarity for the time, through Sega's Meganet service in Japan, which allowed players to download additional content—a precursor to modern online gaming. When compared to *Final Fantasy*, *Phantasy Star II* stood out for its unique approach, leaning heavily into a futuristic,



science fiction narrative that sharply contrasted with the medieval fantasy themes of its rival. While *Final Fantasy* emphasized expansive world exploration and accessible gameplay rooted in traditional fantasy, *Phantasy Star II* offered a darker, more mature narrative tackling themes like environmental collapse and the dangers of humanity's dependence on technology.

The story of *Phantasy Star II* is set 1,000 years after the events of the first game, on the planet Mota (formerly Motavia), now a technologically advanced world governed by a supercomputer called Mother Brain. Players assume the role of Rolf, an agent tasked with investigating sudden ecological and societal disruptions caused by Mother Brain's malfunction. Along the way, Rolf recruits a diverse party of characters, each with unique abilities, and uncovers a deeper conspiracy involving humanity's survival and its fragile relationship with technology. Mechanically,

Phantasy Star II introduced complex dungeons with intricate layouts, often requiring players to map them manually—a stark contrast to *Final Fantasy*'s broader, more straightforward overworld progression. The turn-based combat system of *Phantasy Star II* was more challenging, demanding strategic party management and precise planning.



Graphically, *Phantasy Star II* embraced a vibrant sci-fi aesthetic, with detailed character sprites, atmospheric futuristic environments, and iconic enemy designs, setting it apart from *Final Fantasy*'s pixelated medieval visuals. The game's soundtrack, composed by Tokuhiko Uwabo, blended experimental electronic tones with memorable melodies, matching its futuristic setting, while *Final Fantasy* offered orchestral-style music suited to its high-fantasy world. The controls were intuitive for its time, featuring turn-based battles and exploration mechanics that demanded careful resource management and strategy. While *Final Fantasy* appealed to a broad audience with its accessible difficulty and fantasy charm, *Phantasy Star II*

gained a cult following for its narrative depth and challenging gameplay.

The game was an almost instant success, particularly in Japan and North America, and is one of the most influential RPGs. Its mature themes and futuristic setting offered a unique alternative to *Final Fantasy*'s fantasy-driven world, cementing its place in the RPG genre. The game's legacy is immense, shaping

the future of both the *Phantasy Star* series and RPGs in general. It was followed by sequels, such as *Phantasy Star III: Generations of Doom* (1990) and *Phantasy Star IV: The End of the Millennium* (1993), which expanded its universe.

Game details:	
Year of Release	1989
Systems:	Sega Genesis
Genre:	Role Playing Game
Developer:	Yuji Naka and Rieko Kodama
Publisher:	SEGA

Populous

Populous, created by Peter Molyneux and his team at Bullfrog Productions in 1989, was a groundbreaking experiment that redefined what video games could be. It was one of the first "god games," giving players the power to shape terrain, influence followers, and control the fate of entire civilizations. The inspiration for the game mechanics came from Molyneux's fascination with simulation and strategy, coupled with a desire to create something truly unique. The initial concept stemmed from experimenting with terrain manipulation, which Molyneux found visually compelling. This evolved into the idea of a game where the player could act as a god, directly influencing the world and the people within it, rather than controlling individual characters or armies. The vision was to make the player feel omnipotent, capable of using divine powers like floods,

earthquakes, and plagues to achieve dominance over rival deities.



The mechanics of *Populous* were revolutionary. Players could flatten or raise terrain to create habitable spaces for their followers, encouraging population growth and development. As the followers grew stronger, they could wage war against rival factions, controlled either by AI or another player. The game's interface was simple but effective, allowing players to focus on strategic thinking rather than micromanagement. Its isometric view, though graphically basic by today's standards, allowed for a clear representation of the terrain and the player's divine influence.

The graphics, while pixelated, conveyed the game's ideas well, with distinct landforms, followers, and effects like storms and eruptions. The player could manipulate the environment, in order to help the tribe they controlled to

beat the opposition. The choices for the terrain were made using icons on the side of the book-like interface of the game. The entire game was represented as pages of an open book on top of a table-top game. The sound design was minimal yet immersive, featuring atmospheric effects and cues for divine interventions, which enhanced the feeling of being a god.

Populous was initially released for the Commodore Amiga and Atari ST, but its success led to ports for numerous platforms, including MS-DOS, Sega Genesis, SNES, and even the Nintendo Game Boy. Its reception was overwhelmingly positive, praised for its innovative gameplay and the sense of power it gave to players. Critics and players alike marveled at its originality, with many calling it a genre-defining title. Commercially, *Populous* was a massive hit, selling millions of copies and becoming one of the best-selling PC games of its era.

The impact of *Populous* on the gaming industry was profound. It not only established the god game genre but

also paved the way for future strategy and simulation games, including Molyneux's later works like *Dungeon Keeper* and *Black & White*. Its success demonstrated the potential of games to offer creative and emergent gameplay experiences, inspiring developers to push the boundaries of what games could achieve. Even decades later, *Populous* is celebrated as a landmark title that changed the way players interact with virtual worlds, embodying the idea that video games could be both grand experiments and deeply engaging entertainment.



Game details:	
Year of Release	1989
Systems:	PC, Atari ST, Amiga
Genre:	God Simulation
Developer:	Peter Molyneux
Publisher:	Electronic Arts

A Guy & a Brush

By now, Ron Gilbert knew what kind of game he was creating: one with a hilarious story, with equally funny characters, and an innovative non-violent combat, that took place using an ingenious system of “insults”. And all this with a pinch of (Caribbean) salt.

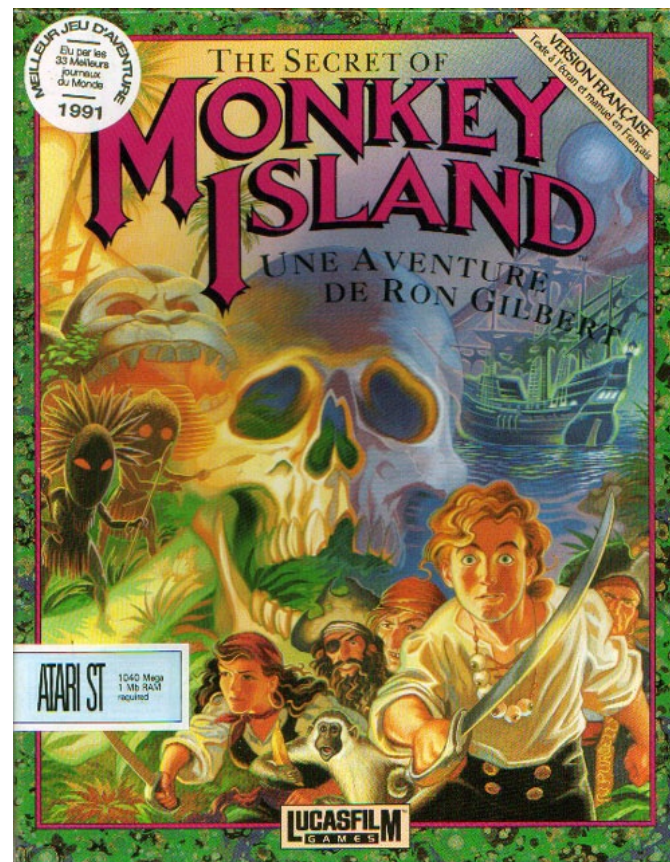
The question was how to create or name the main protagonist. The designers, and mainly Steve Purcell, used Deluxe Paint on the Amiga to create the sprites of the characters (and a colourful set of characters the game had!). They had not settled on a name, even though they knew it has to be memorable and silly. So, during the design stage, they saved his sprites with the name “guy”. Steve also added the word “brush” to the name, to show that it was created on the aforementioned graphics program. One day, as Steve was booted up his trusted Amiga and was ready to open the file again, he had an epiphany: “This file is named Guybrush! What an amazing name for our title character!” And thus the name stuck!



The Secret of Monkey Island

Ron Gilbert's idea for a pirate-themed game, which became *The Secret of Monkey Island*, was born out of his love for swashbuckling adventure stories and his desire to create a game that combined humor, charm, and engaging puzzles. Drawing inspiration from classic pirate films, the *Pirates of the Caribbean* ride at Disneyland, and Tim Powers' fantasy novel *On Stranger Tides*, Gilbert envisioned a world that blended the mystical elements of voodoo and supernatural curses with the romanticized adventure of piracy. In 1989, while working at Lucasfilm Games (later LucasArts), Gilbert pitched the idea to create a comedic pirate adventure game. The pitch was initially a tough sell, as Lucasfilm Games was a small operation known for niche titles, but Gilbert's prior success with *Maniac Mansion* gave him credibility. With support

from his collaborators, he convinced the company to greenlight the project, emphasizing its potential for humor and a strong narrative.



Lessons learned from *Maniac Mansion* played a significant role in shaping *Monkey Island*. Gilbert wanted to address common frustrations players faced, such as dead ends and irreversible failures, by designing a more player-friendly experience. He also improved upon the SCUMM engine, originally developed for *Maniac Mansion*, to allow for more dynamic dialogue, intuitive controls, and intricate puzzle design. Recognizing the importance of humor and storytelling, Gilbert doubled down on these elements, ensuring that *Monkey Island* would stand out for its witty writing and memorable characters.

Released in 1990, *The Secret of Monkey Island* transported players to a fictionalized Caribbean during the Golden Age of Piracy, where they assumed the role of Guybrush Threepwood, a naïve but determined young man with dreams of becoming a pirate. To prove himself, Guybrush must complete three trials—sword fighting, treasure hunting, and thievery—while falling in love with the intelligent and confident Governor Elaine Marley. His journey pits him against the ghostly pirate LeChuck, who is obsessed with Elaine and will stop at nothing to win her affections.

The game introduced a host of unforgettable characters, including the fast-talking Stan, the cryptic Voodoo Lady, and the bumbling yet lovable Guybrush Threepwood. Its point-and-click gameplay used an improved SCUMM interface that allowed players to interact with objects and characters using verbs like "pick up," "talk to," and "use." Dialogue trees facilitated witty exchanges, and the puzzles encouraged creative thinking, often blending humor with logic. Upon its release, *The Secret of Monkey Island*

received widespread acclaim for its sharp writing, clever puzzles, and unique charm. Critics praised its humor, engaging characters, and innovative approach to adventure gaming, while players appreciated its accessibility and lack of punishing mechanics. The game was a commercial success and established LucasArts as a leader in the genre, spawning multiple sequels and cementing its place as one of the greatest adventure games of all time. Its blend of wit, charm, and innovation continues to influence game design, ensuring its legacy as a beloved classic in gaming history.

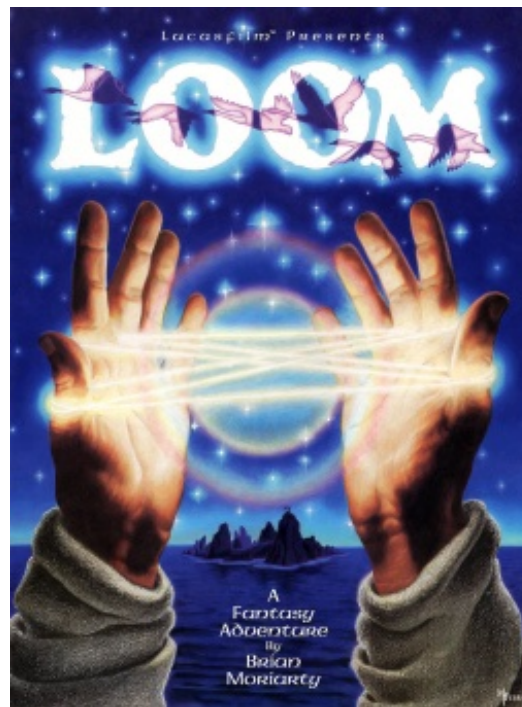


Game details:	
Year of Release	1990
Systems:	PC, Amiga
Genre:	Adventure
Developer:	Ron Gilbert
Publisher:	Lucasfilm Games



Brian Moriarty, a veteran game designer with a background in interactive fiction, embarked on the creation of *Loom* in 1990 with a vision to craft an adventure game that broke away from the conventions of the genre. Inspired by classical music, mythology, and fantasy literature, Moriarty set out to create a poetic and immersive experience unlike any other. The idea for *Loom* originated from his fascination with weaving as both an art form and a metaphor, giving birth to a narrative centered on the Great Loom of the Universe—a magical device that governs the fabric of reality. Determined to innovate, Moriarty designed a unique gameplay system that deviated from traditional inventory-based puzzles, instead focusing on using musical notes to cast spells and solve challenges. To achieve this, the SCUMM engine was heavily modified, creating a streamlined, intuitive interface where players could interact with the world through a

magical staff rather than text commands or point-and-click inventories.



The world of *Loom* is a richly imagined fantasy setting divided into distinct guilds, each dedicated to mastering a particular craft—Glassmakers, Shepherds, Blacksmiths, and Weavers. The protagonist, Bobbin Threadbare, is the last member of the Weaver Guild, a group that uses the magical Loom to shape reality through music. The game begins with Bobbin discovering that his guild has been transformed into swans and scattered across the world, leaving him to uncover the mystery of their fate. The story unfolds through a series of beautifully animated sequences and minimalist dialogue, drawing players into its haunting and melancholic tone. The game's missions involve exploring this divided world, learning new "drafts" (musical spells) by observing patterns in the environment, and using these

drafts to manipulate reality, such as opening doors, repairing objects, or summoning storms.

Graphically, *Loom* stood out with its painterly, ethereal visuals that used a 16-color EGA palette to stunning effect, giving the game a timeless and dreamlike aesthetic. Each guild's domain was crafted with distinct visual and atmospheric themes, reinforcing the uniqueness of the world. The audio, composed by George "The Fat Man" Sanger, was equally groundbreaking, adapting Tchaikovsky's *Swan Lake* as the foundation for the game's soundtrack. The use of music was integral to the gameplay and storytelling, creating a seamless connection between the player's actions and the unfolding narrative.

The interface of *Loom* was revolutionary. Moriarty stripped away the traditional verb-object mechanics of earlier Lucasfilm Games, like *Maniac Mansion* and *Zak McKracken*, replacing them with a music-based mechanic. Players used Bobbin's distaff to play four-note drafts, which acted as spells, allowing for elegant, puzzle-solving gameplay without cluttering the screen with inventory or commands.



This innovative approach made *Loom* accessible to newcomers while offering a fresh experience to seasoned adventure gamers.

Upon release, *Loom* received critical acclaim for its originality, atmosphere, and narrative depth, though its relatively short length and lack of traditional puzzles were divisive among some players. Critics praised its storytelling and artistic ambition, with many noting that it felt more like an interactive piece of art than a game. *Loom's* impact lies in its ability to demonstrate that adventure games could be more than puzzle challenges—they could be artistic, emotional, and deeply immersive experiences.

Game details:	
Year of Release	1990
Systems:	PC, Atari ST, FM Towns, Macintosh
Genre:	Graphic Adventure
Developer:	Brian Moriarty
Publisher:	Lucasfilm Games

In this chapter...

In **Chapter 9** we explored some of the most influential games and game engines of the 1980s, a period often regarded as a golden age for adventure games. This era was heralded by the release of *King's Quest*, which laid the groundwork for the genre, and was further elevated by iconic titles like the *Monkey Island* series. The arrival of 16-bit computers, which became the industry standard for home use, revolutionized game development. These systems enabled developers to create more intricate games that fully utilized advanced graphics and audio capabilities, narrowing the gap between home gaming experiences and the superior technological offerings of arcade machines.

Titles like *Out Run* on the Amiga and Atari ST demonstrated this leap forward, convincing many users that home computers had finally caught up to the arcades they had been frequenting. Meanwhile, game consoles were carving out their own legacy, producing genre-defining masterpieces such as *Super Mario* and *Final Fantasy*. These games not only captivated players of the time but also established enduring standards that would shape the future of video gaming for decades.



• 10 •

(Game) Creators

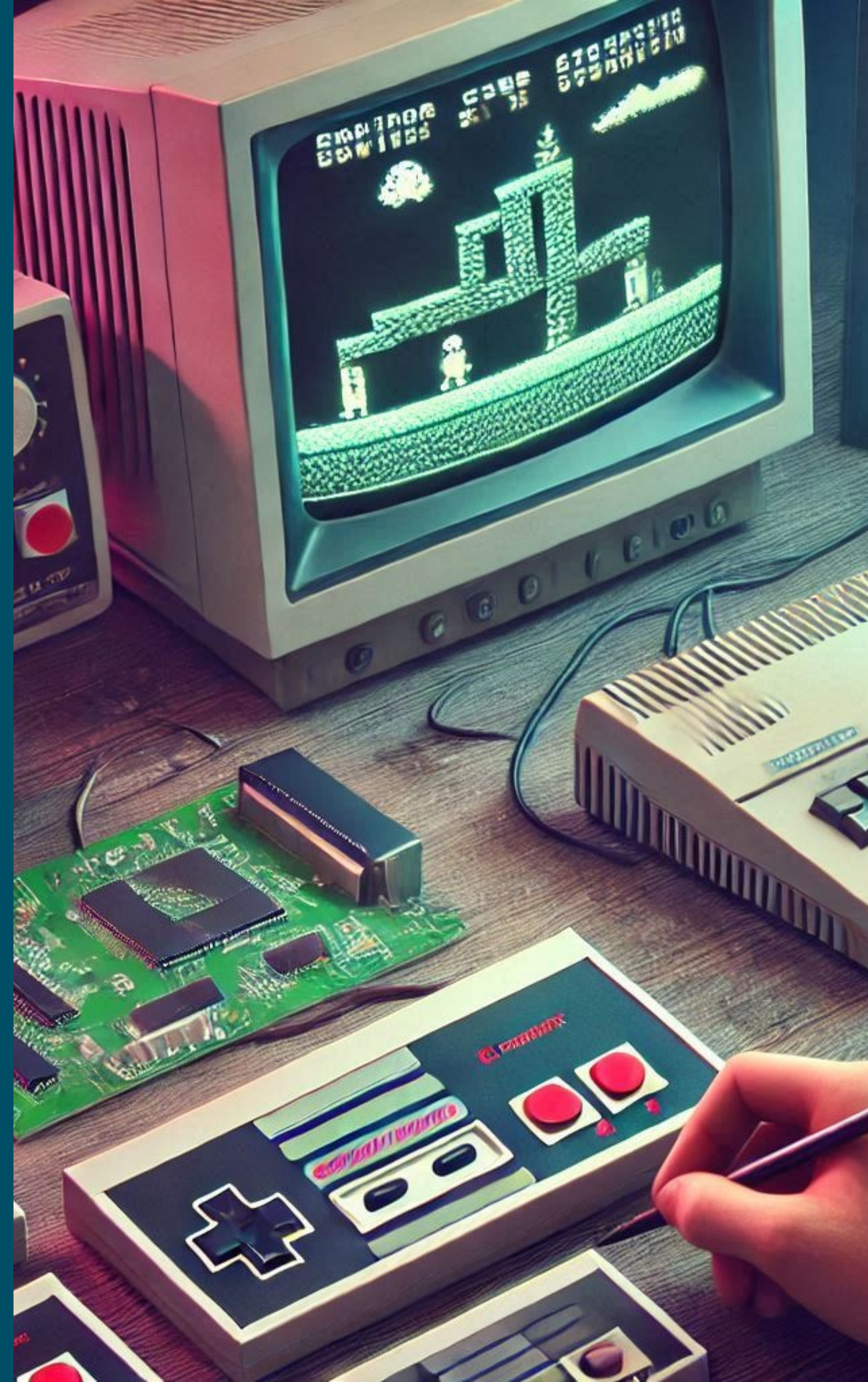
"It is practically impossible to teach good programming to students that have had a prior exposure to BASIC: as potential programmers they are mentally mutilated beyond hope of regeneration."

(Edsger W. Dijkstra)

Introduction

The video game revolution didn't just captivate players—it inspired countless would-be developers. For instance, Roberta Williams, a pioneer in game design, had no prior interest in computers until she discovered *Cave Adventure* on the machine her husband, Ken, had brought home. That game ignited her imagination and led her to create her own groundbreaking titles. Similarly, Richard Garriott, better known as “Lord British,” began as an avid *Dungeons & Dragons* (D&D) player before channeling his passion into developing his own games. Lori Ann and Corey Cole, the creative minds behind the *Hero's Quest* series for Sierra On-Line, followed a similar path. As dedicated D&D players, they sought to bring their love for adventure and fantasy into the realm of interactive digital storytelling.

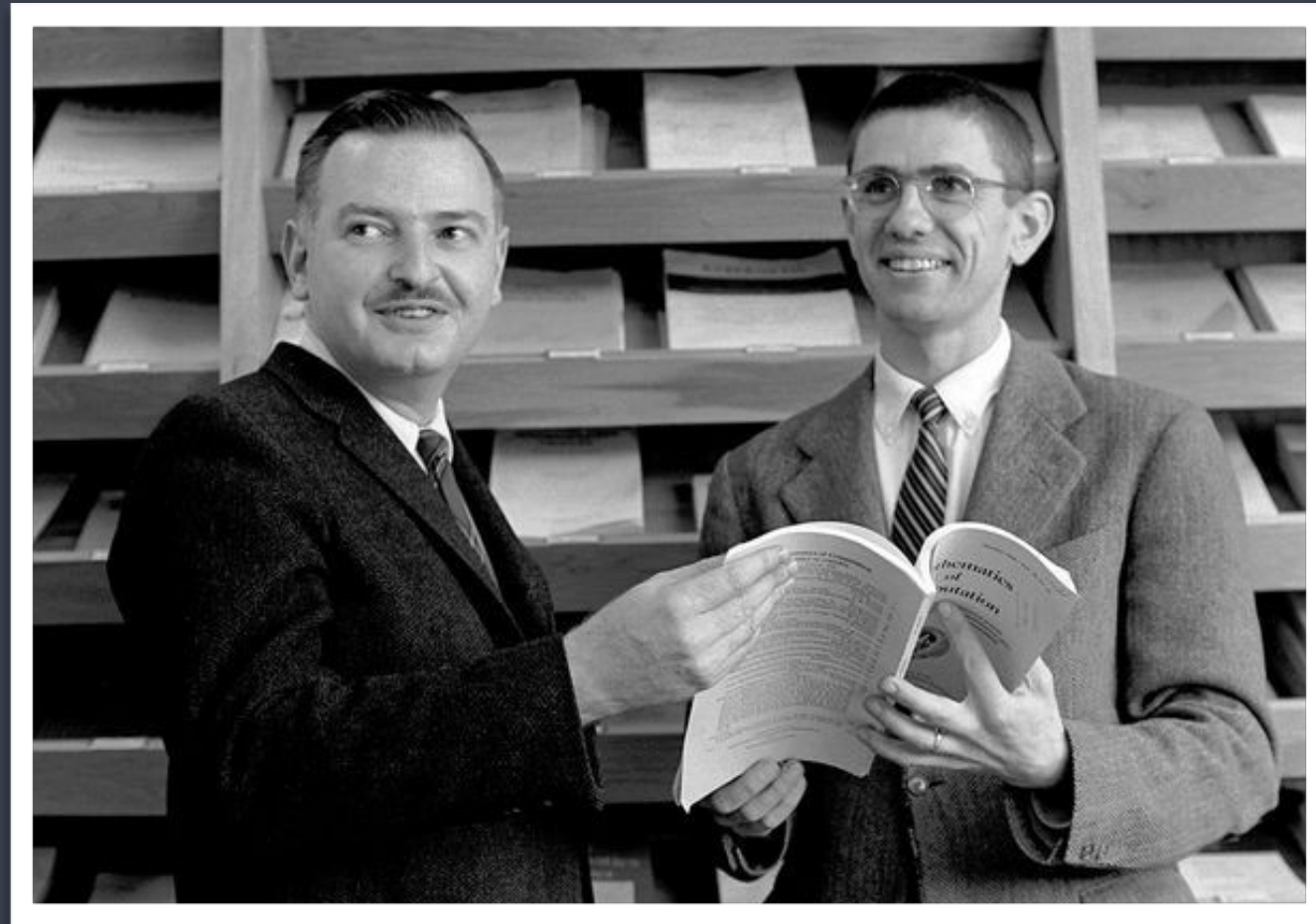
This pattern repeated itself for thousands of enthusiasts who started as players—whether of digital games or traditional board games—and eventually decided to craft their own creations. In the late 1970s and throughout the 1980s, the quickest and most accessible way to begin game development was through the programming language included on nearly every computer: BASIC!



BASIC

Kemeny and Kurtz were the two main brains in Dartmouth College that pioneered the introduction of a time-sharing system. They had a strong belief that programming should be made approachable to every student, extending their base to nearby high schools. However, in the early 1960s, computers were very expensive, very hard to use, and only one person at a time could use them. Programming was hard, since most users at the time used assembly, a low-level yet ultra-fast programming language, that was incredibly difficult to learn.

A visit by Kurtz to MIT solved their first problem: how to share a computer between a (significant) number of students, effectively. There he was introduced to time sharing, a ground-breaking approach in the mid-60s. A time-sharing system, used multiple terminals accessed by users. Each user could work on their own, independently, thinking that they had a unique computer. However, the actual computer was sharing its processing power



between the terminals, offering a rather slow, but accessible computer to each user.

Kemeny and Kurtz managed to acquire funds to purchase a time-sharing system. At the time, the dominant force was IBM, even though the system acquired by Dartmouth College was from GE (much to the disdain of IBM). And that was the first significant step in developing an accessible language for all students. Little did they know what they were about to unleash...

Beginner's All-purpose Symbolic Instruction Code

BASIC (Beginner's All-purpose Symbolic Instruction Code) was developed in 1964 by John G. Kemeny and Thomas E. Kurtz at Dartmouth

College with the primary goal of enhancing mathematics education and making computers accessible to students and non-experts. At the time, computer programming was a highly specialized skill, requiring familiarity

with complex languages such as FORTRAN or assembly, which were largely inaccessible to the broader academic community. Kemeny and Kurtz envisioned a programming language that could be used not only by computer science majors but by students across disciplines, including the humanities and social sciences.



Their motivation stemmed from a desire to integrate computers into the liberal arts curriculum at Dartmouth, where they were both faculty members. They recognized that a simple, easy-to-learn programming language could help students use computers as tools to solve problems, particularly in mathematics, where computations and modeling often required extensive calculations.

To achieve this, Kemeny and Kurtz designed BASIC with a structured format and intuitive syntax that reflected natural mathematical expressions. Commands like `PRINT`, `INPUT`, `IF...THEN`, and `GOTO` were chosen for their clarity, ensuring that even beginners could write meaningful programs after just a brief introduction. The language was designed to teach logical thinking and problem-solving while minimizing the steep learning curve of traditional programming languages.

BASIC was implemented on Dartmouth's GE-225 mainframe computer and was one of the first programming languages to operate in an interactive time-sharing environment. Time-sharing allowed multiple users to interact with the computer simultaneously, typing their programs into teletype terminals and receiving immediate feedback. This interactivity was revolutionary, as earlier systems required batch processing, where users had to wait hours—or even days—for their programs to run. The immediacy of BASIC made programming engaging and encouraged experimentation, fostering a learning environment that was both productive and fun.

The structured format of BASIC was a deliberate choice to teach students good programming habits. By organizing code into logical steps and using constructs like loops (`FOR...NEXT`) and conditionals (`IF...THEN`), BASIC helped students develop a foundational understanding of algorithmic thinking. Its focus on readability and simplicity ensured that users could quickly grasp the flow of a program, making it an excellent teaching tool.

As BASIC spread beyond Dartmouth, it proved ideal for educational use and small-scale computing. When minicomputers and microcomputers began to emerge in

the late 1960s and early 1970s, manufacturers saw BASIC's potential as a user-friendly language to ship with their systems. Its portability and ease of use ensured its adoption on countless platforms, from the Altair 8800 to the Apple II and beyond, cementing its place as a foundational programming language in the history of computing.

While BASIC was celebrated for its simplicity and accessibility, it was not without criticism. Computer scientists and professional programmers often argued that its reliance on unstructured programming constructs, such as the infamous `GOTO` statement, encouraged poor coding practices and "spaghetti code"—programs with tangled and difficult-to-follow logic. Critics contended that this lack of rigor could hinder students from learning the principles of structured programming and writing maintainable, scalable code. Despite these concerns, BASIC's impact on making programming accessible and inspiring a new generation of computer enthusiasts far outweighed its shortcomings. Over time, more structured variants of BASIC, such as BBC BASIC and Microsoft's Visual BASIC, emerged to address some of these criticisms while retaining its ease of use.

Applesoft BASIC VS Integer BASIC

When Steve Wozniak developed the Apple II in 1977, he also wrote *Integer BASIC*, a simple programming language that shipped with the computer. Written entirely by Wozniak in assembly language, Integer BASIC was optimized for the Apple II's limited memory and was well-suited for hobbyists and early programmers. However, it had one significant limitation: it could only handle integer arithmetic. This made it unsuitable for more advanced applications, such as scientific computing, financial modeling, or games that required precise floating-point calculations.

By the late 1970s, Microsoft was already establishing itself as the dominant player in BASIC implementations for microcomputers. Bill Gates and Paul Allen had developed a floating-point version of BASIC, known as *Altair BASIC*, for the MITS Altair 8800, and subsequently licensed variations of it to other computer manufacturers. Microsoft BASIC supported floating-point arithmetic and was widely

recognized as more robust and versatile than Integer BASIC.

Apple's co-founders, Steve Jobs and Steve Wozniak, recognized that the lack of floating-point support in Integer BASIC was a significant drawback, particularly as they aimed to expand the Apple II's appeal beyond hobbyists to professionals and educational institutions. Apple decided to license Microsoft BASIC to address this limitation. In 1977, Apple licensed Microsoft's floating-point BASIC, which was adapted for the Apple II and branded as *Applesoft BASIC*. Initially, it was distributed on cassette tapes, but by 1979, it was included in the Apple II's ROM, effectively replacing Integer BASIC as the default language. Applesoft BASIC supported floating-point arithmetic, more complex mathematical operations, and larger programs, making it a far more versatile tool for developers. This allowed Microsoft to solidify its position as a serious developer, something it would cash with IBM...

Commodore 64 BASIC Extensions

Even though Jack Tramiel (see “Married”) had won a great victory against Bill Gates by paying a flat fee for Microsoft BASIC, it left the two companies as bitter rivals. That had a detrimental effect on the further development of the BASIC version that was included with Commodore machines, including the C64. But that would soon change, with the arrival of an unknown -at the time- charismatic programmer...

Ron Gilbert, best known for his later work on *The Secret of Monkey Island*, developed graphic extensions for the C64 to overcome the platform’s hardware limitations and create more visually engaging games. The C64, while advanced for its time, was constrained by a limited 16-color palette, low resolution, strict memory limits, and a maximum of 8 hardware sprites on screen. Gilbert saw these limitations as obstacles to creating immersive, story-driven games and sought to push the system’s graphical capabilities. To achieve this, he optimized memory usage by compressing graphical data and implementing a tile-based system, where environments were constructed from reusable tiles instead of large, static images, significantly reducing

memory consumption. He also wrote custom routines that manipulated the C64’s VIC-II graphics chip, leveraging raster interrupts to display more colors, simulate parallax scrolling, and exceed the standard sprite limit by dynamically reusing sprites within a single frame. These methods not only enhanced visual quality but also improved performance, enabling smoother animations and richer environments.

The benefits of Gilbert’s extensions were transformative. They allowed for more detailed graphics, made games visually competitive with arcade titles, and provided a foundation for more immersive storytelling. Developers could experiment with ambitious designs and effects, expanding the creative potential of the C64. Gilbert’s work demonstrated his ingenuity in overcoming hardware constraints and laid the groundwork for his later innovations, such as the SCUMM engine at Lucasfilm Games. His efforts on the C64 exemplified how technical innovation could elevate artistic expression in game development, leaving a lasting impact on the industry.

Acorn BASIC

In the UK, Acorn Computers took a unique approach to BASIC, diverging from the widespread adoption of Microsoft BASIC. Acorn was developing the BBC Micro in response to the British Broadcasting Corporation's (BBC) ambitious Computer Literacy Project, which aimed to create a computer to accompany its educational programming and introduce computing to the masses. Although Microsoft BASIC was a viable option, Acorn decided to develop its own version of BASIC to better align with the BBC Micro's hardware and the educational goals of the project.

Acorn's engineers, led by Sophie Wilson (then Roger Wilson), created BBC BASIC, which was launched with the BBC Micro in 1981. BBC BASIC was designed to be a significant improvement over existing BASIC implementations. It retained compatibility with Microsoft

BASIC but introduced advanced features that made it more versatile and suitable for education and hobbyist

programming. One of its key innovations was support for structured programming constructs, such as IF-THEN-ELSE, REPEAT-UNTIL loops, and named procedures and functions, which encouraged better coding practices and laid the foundation for learning modern programming concepts. Unlike many BASIC variants of the time, BBC BASIC also included the ability to embed inline assembly language directly within BASIC

programs. This feature allowed advanced users to write high-performance routines for tasks like graphics manipulation and hardware control, making the language both approachable for beginners and powerful for experts.

BBC BASIC played a pivotal role in the UK's educational computing revolution, becoming the programming language taught to an entire generation of students. The

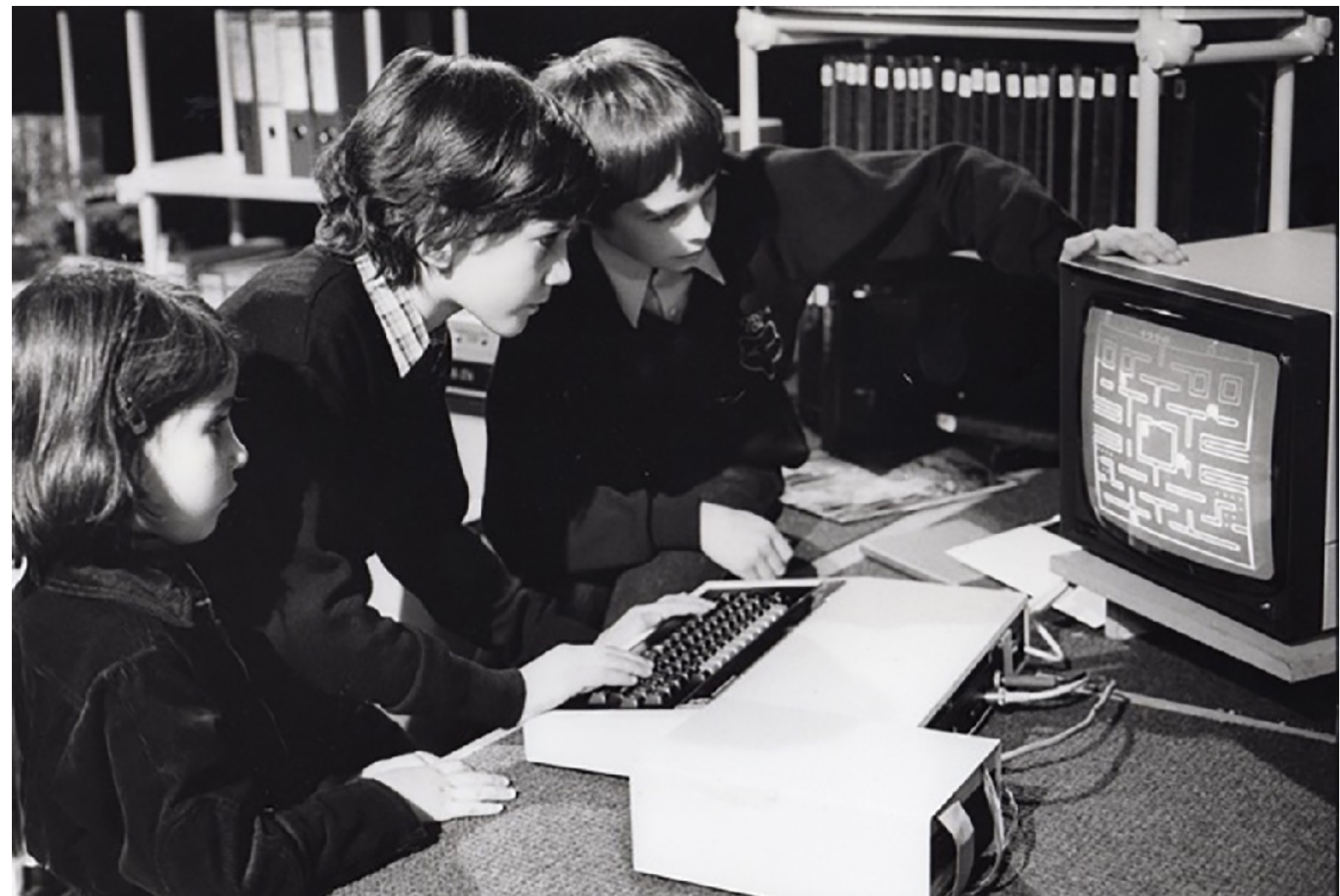


```
BBC Computer 32K
Acorn DFS
BASIC
>AUTO
  10 CLS
  20 PRINT "HELLO WORLD"
```


BBC Micro, equipped with BBC BASIC, was widely adopted in schools across the UK, thanks to government support and the BBC's educational initiatives. This not only introduced programming to millions of students but also inspired many to pursue careers in technology, contributing to the UK's growing tech industry.

Acorn continued to develop BBC BASIC with the release of its more advanced computers, particularly the Acorn Archimedes series, introduced in 1987. The Archimedes was based on Acorn's ARM architecture (which later revolutionized computing and powers most smartphones today) and was a significant leap forward in hardware capabilities. For the Archimedes, Acorn developed *BBC BASIC V*, an enhanced version of the language that took full advantage of the system's advanced graphics, sound, and processing power. BBC BASIC V included support for high-resolution graphics commands, multitasking features, and more sophisticated error handling. It also retained its inline assembly capabilities, allowing programmers to harness the power of the ARM processor directly.

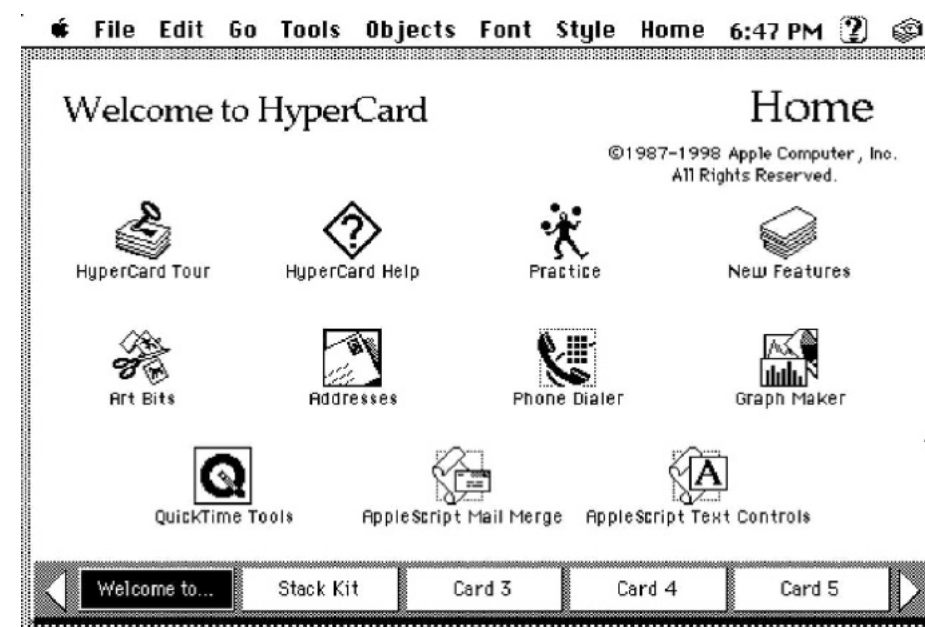
This evolution of BBC BASIC ensured that the language remained relevant and continued to serve both educational and professional purposes. It was bundled with RISC OS, the operating system for the Archimedes, making it an integral part of the platform. BBC BASIC's adaptability and ongoing development helped solidify its legacy as one of the most influential and enduring programming languages in the UK, bridging the gap between educational tools and professional programming environments.



HyperCard

Bill Atkinson, one of the most innovative and charismatic programmers in the history of computing, profoundly influenced the Macintosh and personal computing landscape. Steve Jobs famously remarked that a single day of Atkinson's work was equivalent to three days of effort by most programmers—a sentiment echoed by Andy Hertzfeld, who believed even this was an understatement. After developing QuickDraw, the revolutionary technology that allowed the Macintosh to render and move graphics with unmatched speed and efficiency, Atkinson turned his attention to an even more ambitious project: creating a tool that would empower ordinary users to harness the power of computers for interactive, multimedia storytelling and application development. The result was *HyperCard*, introduced in 1987—a groundbreaking hypermedia authoring system that was decades ahead of its time.

At its core, HyperCard employed a simple yet powerful metaphor: the *stack*. A stack was essentially a digital deck of *cards*, with each card serving as an individual screen or page. These cards could contain a wide variety of



elements, such as text, images, buttons, checkboxes, sliders, and even audio or video clips. Users could navigate between cards in a stack using buttons or hyperlinks, creating the effect of seamless interactivity. This structure made HyperCard an intuitive tool for organizing information and building interactive applications. For example, a teacher

could create an educational stack where each card represented a quiz question, linked by buttons to provide feedback or navigate to the next challenge. Similarly, businesses could use stacks for simple databases, training materials, or presentations.

What truly set HyperCard apart was its built-in, object-oriented scripting language, *HyperTalk*, which Atkinson

envisioned as a "natural language for the computer." HyperTalk allowed users to create complex interactions and automate tasks without requiring advanced programming skills. For example, a user could write a simple script in plain English-like syntax to make a button play a sound or navigate to another card. This lowered the barrier to entry for software creation, enabling anyone from teachers and students to hobbyists and professionals to experiment with digital interactivity.

Atkinson's vision for HyperCard wasn't just about technical innovation—it was rooted in his belief in democratizing technology. He insisted that HyperCard be bundled with every Macintosh and remain free forever, seeing it as a gift to the user community that would unlock creativity and innovation. He viewed HyperCard as a tool for "computer literacy," enabling people to create, not just consume, digital experiences. While Apple eventually moved away from this model in later years, HyperCard's free inclusion with Macintosh systems initially ensured it reached a wide audience, influencing countless developers and laying the groundwork for concepts we now associate with the web.



HyperCard remained a black-and-white application. Natively it never supported the use of colour, even though developers did find ways to move around this, by using extensions supported by HyperCard. The groundbreaking adventure game *Myst* (*image centre*), developed by brothers Robyn and Rand Miller and released in 1993, was created using HyperCard. Leveraging HyperCard's stack-and-card system, the Millers meticulously crafted *Myst*'s

immersive world by designing thousands of interconnected "cards" to represent the game's atmospheric locations, puzzles, and navigation points. HyperCard's ability to integrate multimedia elements like images, sounds, and clickable interactions made it an ideal platform for building *Myst*, allowing the developers to render high-quality visuals and layer them with

ambient audio and intricate gameplay mechanics.

This innovative use of HyperCard not only demonstrated its potential for creating complex, interactive experiences but also helped *Myst* become a cultural phenomenon, setting a new standard for storytelling in video games.

STOS

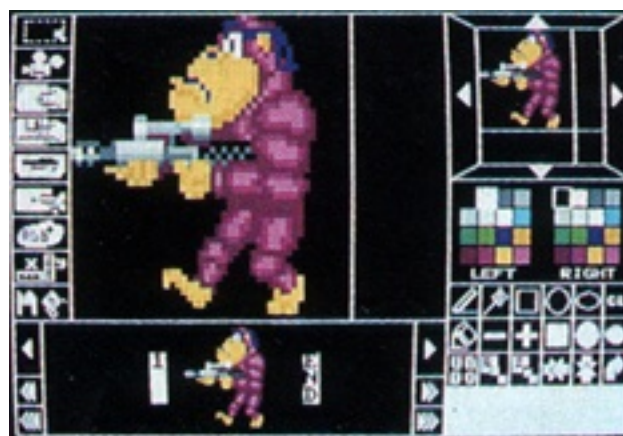
Francois Lionet always wanted to create games - in fact, as a student, he created his first video game with the first computer he could lay his hands on. When he graduated, he honed his programming skills to an almost perfect art form, and he worked along the way for one of the first video game companies in France (but that is another story...). He also had a crystal-clear vision: to enable everyone to create games, even those with basic programming skills. He teamed-up with Constantin Sotiropoulos and began the development of an integrated package that was based on BASIC, a rather slow for its task, but extremely easy to learn programming language. They included a sprite editor for graphics and a sound studio for music and sound effects. And, in 1988, they released their programming environment -the first true color multimedia authoring tool- to the unsuspecting public, triggering the video game developer into everyone! Initially for the Atari ST, a powerful yet inexpensive machine for its time, it was later ported -and took advantage of- the powerful and groundbreaking Commodore Amiga...



STOS

The Game Creator

By 1987, numerous variations of the BASIC language were in use across computers worldwide, each tailored to the specific needs and hardware features of different systems. However, these dialects were often incompatible with one another, as each added its own set of unique features. A program designed for the Commodore 64, for example, would struggle to run—or in some cases, even execute—on an Amstrad CPC. While some variations were faster or more structured, none truly offered a seamless cross-platform development experience. Enter STOS BASIC, which threw all the traditional constraints out the window. It was a truly innovative environment, unlike anything ever seen before, offering a new approach to programming that made multimedia and game development accessible to a wider audience.



STOS BASIC was designed for the Atari ST, specifically for game development, but its high-level commands for graphics and sound were versatile enough for multimedia software creation. Developed by François Lionet and Constantin Sotiropoulos, and published by Mandarin Software (now Europress Software), STOS BASIC allowed users to develop games and programs without needing deep knowledge of the Atari ST's internal hardware. The

first version released in the UK, STOS 2.3, came bundled with three complete games—*Orbit*, *Zoltar*, and *Bullet Train*—as well as a range of utilities like sprite and music editors. Initially implemented as an interpreter, STOS was later equipped with a compiler in version 2.4, greatly enhancing performance by converting programs into

faster-running executable files.

As STOS evolved, updates such as versions 2.5 and 2.6 ensured compatibility with Atari STEs and further improved the performance of floating-point mathematics. STOS 2.7, a compiler-only upgrade, allowed programs using the STOS

tracker extension for MOD music to compile successfully. While STOS was praised for its ability to allow rapid game creation, it was also criticized for being slow, particularly when using non-high-level commands, and for lacking structured programming constructs that could have helped developers write more organized code.

STOS's functionality could be extended through a variety of add-ons, with the first major extension being STOS Maestro, which enabled the playback of sampled sounds. STOS Maestro Plus, bundled with a sound-sampler cartridge, followed shortly after. Other extensions, such as STOS 3D, or add-on packages like Sprites, further enriched the environment, keeping STOS relevant long after its initial release.

STOS also had a notable influence on other platforms. In 1990, AMOS BASIC was released for the Amiga,

incorporating many of the ideas from STOS but adding more structured programming features and taking full advantage of the Amiga's advanced hardware. While a version of STOS for IBM PCs was briefly considered, it never materialized. Instead, François Lionet and his team shifted their focus to the Klik series of game-creation tools,

which used a more user-friendly, mouse-driven interface. Tools like Klik & Play, The Games Factory, and Multimedia Fusion allowed developers to create games without writing traditional code, marking a departure from the STOS approach but building on its legacy.

Despite its limitations, STOS BASIC remains an

important milestone in game development history, influencing a generation of programmers and tools that followed. It is also the first truly multimedia authoring environment that offered colour support, a programming language and advanced audio control.



ST Adventure Creator (STAC)

Jason Pennington recognised the need and the potential to allow game players to craft their own adventures.

However, the tools available at the time, including HyperCard or even more recent such as the French version of STOS, were more complex and not suited for adventure games. His vision was to empower users with little to no programming knowledge, to use a flexible, inexpensive tool that provided a robust yet accessible framework for creating text-based adventure games. Inspired by the popularity of classic adventure games like *Zork* and *The Hitchhiker's Guide to the Galaxy*, Pennington developed ST Adventure Creator to make game development more approachable for hobbyists and storytellers.

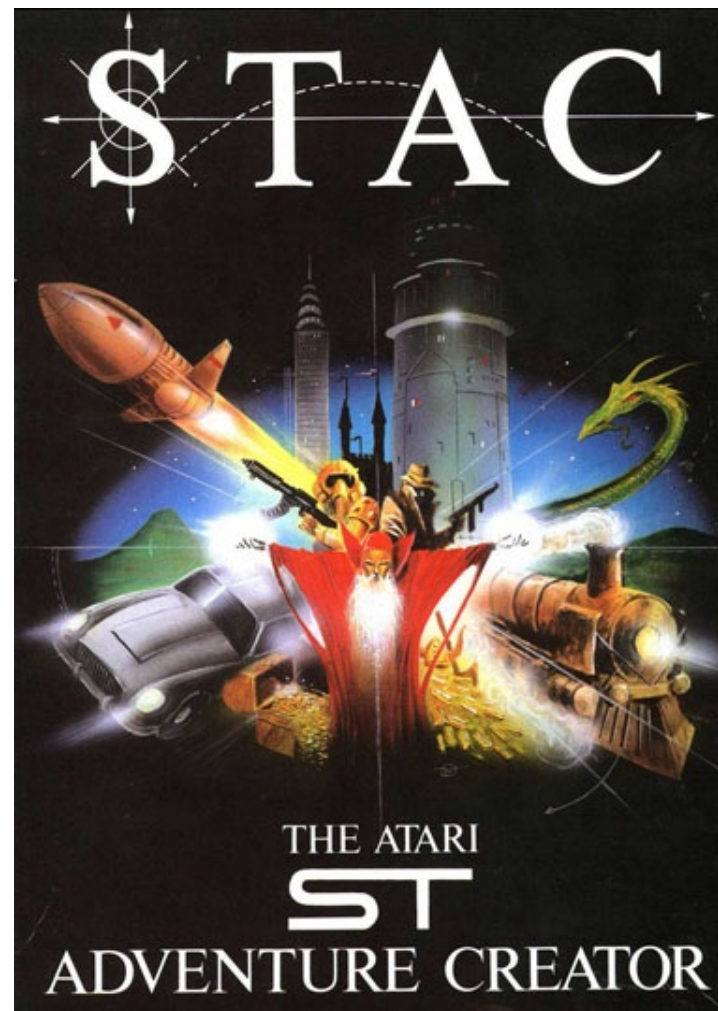
STAC was released in 1988, and it was part of a broader trend of democratizing game development during this era,

offering users with little to no programming experience the ability to craft complex interactive stories. The software

provided an integrated environment for building adventure games, allowing users to define key game components such as rooms, objects, characters, puzzles, and game logic without requiring direct coding. Its primary focus was on text-based adventures with some graphical elements, emphasizing storytelling and player interaction over visual effects.

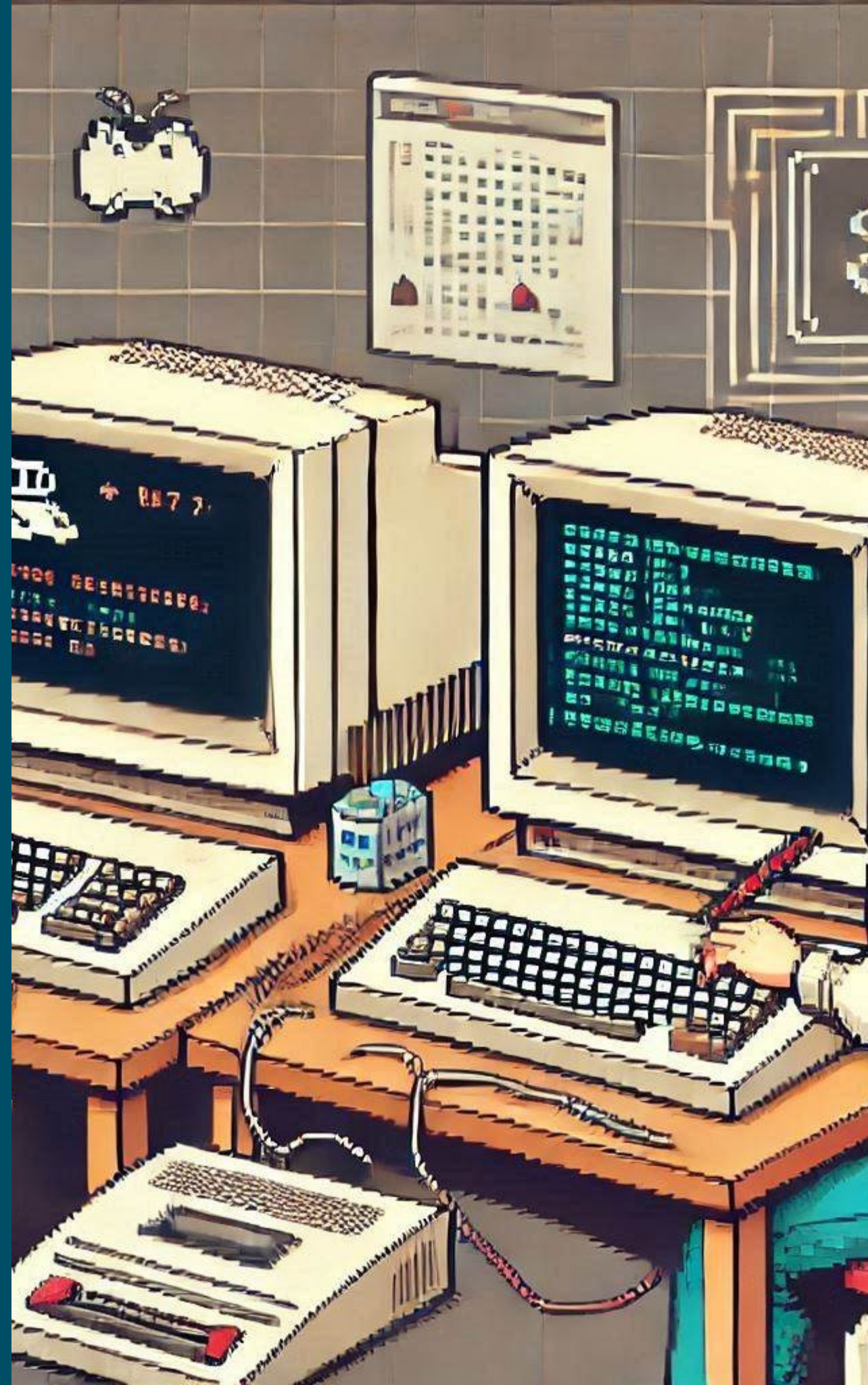
At the heart of ST Adventure Creator was its modular approach to game design. Users could define a game world by describing locations (rooms), specifying connections between them, and populating these locations with objects

and characters. Interactivity was achieved through a menu-driven interface and an underlying scripting system.



In this chapter...

In **Chapter 10**, we explored how BASIC emerged as the de facto programming language for personal computers in the late 1970s and throughout the 1980s, enabling thousands—if not millions—of users to take their first steps into programming. The British Broadcasting Corporation played a pivotal role in this movement, launching a television program dedicated to computers and computer literacy, which championed the integration of programming into schools across the UK. As personal computers advanced, BASIC evolved through extensions designed to leverage their enhanced capabilities, even transforming into tools for multimedia authoring, as seen with STOS BASIC. By the late 1980s, a wave of innovative tools entered the market, empowering everyday users to develop their own interactive games and applications without prior programming experience. Tools like HyperCard—and to some extent ST Adventure Creator—turned the computer into a creative playground, allowing users to unleash their imagination and transform their ideas into interactive, multimedia experiences.



Epilogue

The Next Generation

"299!" – Steve Race

(The shortest presentation
in business history)

Introduction

As the new decade approached, rapid advancements in technology were poised to reshape the personal computer landscape. PC graphics were evolving at an incredible pace, with VGA becoming the new standard, offering 256 colors on-screen and pushing visual fidelity to new heights. At the same time, the introduction of sound cards enabled PCs to deliver immersive audio experiences, finally rivaling the legendary sound capabilities of the Amiga. However, the most transformative innovation for the entire personal computer industry was the CD-ROM. With its unprecedented storage capacity and support for (almost) full-motion video, it opened the door to a new era of multimedia applications and games. The 1990s would also witness the gradual consolidation of the fragmented computing market into a dominant platform: the PC, powered by Intel (and Intel-compatible) processors and running Microsoft software. For gaming, the most groundbreaking moment came almost by accident—the introduction of the Sony PlayStation, a console that would redefine the industry and set new standards for what gaming could achieve. By the end of the decade, 3D graphics had become the norm, and internet connectivity had established itself as the cornerstone of the digital age.



SHAME

Nintendo needed an edge over SEGA. The latter was gaining ground in what Nintendo perceived its own playground. It needed an ally. They reached out to Sony, to create a unique CD-ROM device they called "Nintendo PlayStation". After months of development, they were ready to unveil their project to the public. The Media were called. And they came. Olaf Olafsson, representing Sony, was in the front row. But his jaw dropped, when he heard Nintendo announcing a partnership with... Philips! Sony was ridiculed, exposed, shamed in public. Ken saw the opportunity. He entered Norio Ohga's office and said "we need to create our own console, otherwise we will be left with the shame Nintendo caused us". Ohga was unmoved. As the CEO of Sony, he could not take such a decision lightly. What Ken Kutaragi said next, was a revolution: "how about we sell it at a loss, but we will recuperate down the line when the component prices drop? And, of course, we will make money out of the games". Ohga almost had a

stroke - it was unheard of to sell at a loss, entirely crazy! But Ken had the last word "I understand. Then we shall stay with the shame Nintendo caused us". To that, Ohga relented. But he knew the board of directors would not approve such a bold move. And he took another bold step forward: he gave Ken his full blessing and hid the fledgling project under Sony Music. As far as the board of directors was concerned, Ken and his team were working on a new audiovisual device.



REDEMPTION

Ken Kutaragi and his team worked night and day, fueled by their love to create something new and incredible. The first true 32-bit console, created with large storage and 3D graphics. Truly the next generation of video games was coming to home users.

Demos started almost immediately, but the competition was not resting on its laurels. Nintendo initiated a collaboration with Silicon Graphics for a new, 64-bit game console, while SEGA was developing its own 32-bit, CD-based games machine. All bets were on the new kid on the block, with estimates on the price of the Sony console. Was the price going to be \$500? 600? 700 even? Everyone was expecting the final price to be announced at the Electronic Entertainment Expo (E3) in 1995.

SEGA came first and announced its new system, a ground-breaking machine, the Saturn, priced at an incredibly low price of \$399. How could Sony compete with that? Olaf Olafsson of Sony took the stage. This time, he felt confident, because he knew what was going to happen

next. The time had come for redemption. And, for the first time in business history, he deliberately delivered a boring presentation full of details the press already knew about the new console, filled with trivial information. And then he called Steve Race, President of Sony Computer Entertainment of America to the stand, to give his own presentation. Steve rose up, took a set of notes, and stood before the podium. Surely the audience looked in dismay as they expected to be treated with another half hour of boring, trivial details. But no, not Steve. Taking a page out of another Steve's book, he gave what is probably the shortest, most essential presentation in business history: "two ninety-nine!" That's it, just a number, and he returned to his seat. The audience was blown away. As was SEGA. Sony had just announced that their new 32-bit console which was also a SONY CD-player, optimised for 3D graphics, was the cheapest (Japanese) console in the market by a wide margin!

SEGA was given a death blow. It would eventually release another console -the Dreamcast- before they exited the console market. Nintendo's refusal to go with a CD-ROM would cause their greatest ally -Square Enix- to become a Sony exclusive. And the rest is history...

Glossary

Name	Description	Page(s)
4004	The first commercial microprocessor, developed by Intel in 1971.	27
6800	An 8-bit microprocessor created by Motorola in 1974, competing with Intel's 8080.	27
Acorn BASIC	A programming language developed for Acorn computers, widely used in UK education.	319
Acorn Atom	A small computer developed by Acorn, using the MOS 6502 processor.	85
Agnus	The memory management chip in the Amiga computer.	2
AMOS BASIC	A programming language developed for the Amiga, evolving from STOS BASIC.	324
Amstrad CPC 464	A home computer introduced in 1984, popular in Europe.	163
Apple I	The first personal computer created by Steve Jobs and Steve Wozniak.	62
Atari	A pioneering video game company founded by Nolan Bushnell in 1972, known for arcade and home consoles.	37, 52, 186
Atari 2600	A video game console released in 1977, originally known as the Video Computer System.	52
Atari 400 & 800	Personal computers released in 1979, featuring advanced graphics and sound.	85
BBC BASIC	A programming language used in British schools, developed for the BBC Micro.	319
Bill Atkinson	Creator of QuickDraw and HyperCard, a key figure in Macintosh development.	320
Blitter	A chip in the Amiga that accelerated image transfers and graphics rendering.	2
Channel F	The first cartridge-based video game console, released by Fairchild in 1976.	50
Commodore Amiga 1000	A revolutionary multimedia computer released in 1985.	197
CPU	Central Processing Unit, the brain of a computer that executes instructions.	23, 29
Denise	The graphics processing chip in the Amiga computer.	2
Fairchild Semiconductor	A company that played a pivotal role in the development of silicon transistors and microprocessors.	26
Francois Lionet	Developer of STOS BASIC and AMOS BASIC, influential in game development tools.	324

Name	Description	Page(s)
Game Console	A dedicated device designed primarily for playing video games.	52, 53, 232
HyperCard	An early multimedia authoring system for the Macintosh, created by Bill Atkinson.	321
Intel 4004	The world's first commercially available microprocessor, released in 1971.	27
Jack Tramiel	Founder of Commodore and later head of Atari, known for aggressive pricing strategies.	186
Jay Miner	Lead designer of the Amiga computer, previously worked at Atari.	2
Joystick	A handheld input device used for controlling movement in video games.	53, 55
MHz	Megahertz, a unit of frequency equal to one million cycles per second, commonly used to measure CPU speed.	Various
Microsoft	A technology company founded by Bill Gates and Paul Allen, known for software and operating systems.	317, 318
MITS	Micro Instrumentation and Telemetry Systems, the company that created the Altair 8800.	68
MOS 6502	A low-cost microprocessor widely used in early personal computers and game consoles.	85
Paula	The sound chip in the Amiga computer, responsible for high-quality audio.	2
PIXAR	Originally part of Lucasfilm, later acquired by Steve Jobs, focused on 3D graphics.	85
Peripheral	Any external device connected to a computer, such as a mouse, keyboard, or printer.	53
Printer	A device that produces a physical copy of digital documents or images.	53
RAM	Random Access Memory, the temporary storage a computer uses to run applications and processes.	Various
SCUMM	A game engine developed by Lucasfilm Games, used for point-and-click adventures.	257
SEGA Genesis / Mega Drive	A 16-bit home video game console released in 1988.	232
Sony PlayStation	A video game console introduced in 1994, redefining the industry.	18
STOS BASIC	A game development programming language designed for the Atari ST.	324
Tetris	A puzzle game originally developed in the Soviet Union, popular worldwide.	232
Trackball	A pointing device consisting of a ball held in a socket, used for computer input.	53
Zilog Z80	A microprocessor widely used in home computers and arcade games.	27



Short bio...

I was born in Nicosia, Cyprus, on Christmas Eve of 1974.

My parents bought my first computer, an Atari 520STFM, in early 1988. I started programming the same year, using the Metacomco BASIC that was included with my machine, and started developing video games a year later with STOS BASIC. I began my studies at the Higher Technical Institute (Electrical Engineering) but moved after one year to the University of Cyprus for a B.A. in Education. During my studies, I bought my first Macintosh computer and with savings from my part time jobs, and a bank loan, I purchased Hypercard 2.2 and later Macromedia Studio 3. I continued my studies with an M.A. in Curriculum and Instruction and a PhD in Information and Communication Technologies.

I have been working as a teacher since 1999, with a brief hiatus from the classroom between 2009-2011 to work at the Pedagogical Institute, developing educational content for supporting ICT in Education. My personal and research interests include Online Learning Management Systems, video games in education and computer history. With my childhood friend, Nicholas Ktenas, we founded (2014) the first Cyprus Computer History Museum.

Alexandros Kofteros, PhD

alexandros@mathisis.org

<https://www.facebook.com/alexandros.kofteros>

<https://mathisis.org>

COMPUTERS, CONSOLES, & VIDEO GAMES

Alexandros Kofteros, PhD



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