

# HISTORY OF VIDEO GAMES

- **The Microprocessor Shakes Up Video Games**
- **Computing Gaming From Mainframes to the Home**
- **Rise of the Cartridge-based Consoles & Space Invaders Storm the World**

The background is a dark blue gradient. In the corners, there are decorative white circuit-like patterns consisting of lines and small circles, resembling a printed circuit board or a network diagram.

# CH 4: THE MICROPROCESSOR SHAKES UP VIDEO GAMES

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- 1950: Victor Green
  - Car Ownership & Suburban Living
  - Shopping Mall: Southdale Center Mall in Edina Minnesota
  - Malls: 7600 (1964) & 13,174 (1972)
- Dave Nutting
  - MCI Milwaukee Coin: electro-mechanical games
  - Aladin's Castle: coin-operated arcades in the mall
  - Red Baron Game Rooms: 20 Locations (Ohio – Phoenix)
  - Shut down MCI & build relationship with Intel
- Dave Nutting Associates

# CH 4: THE MICROPROCESSOR SHAKES UP VIDEO GAMES

- Dave Nutting Associates
  - Intel 4004: First functioning microprocessor
  - Dave & Jeff (Fredriksen) received one of the 50 development units
  - Strategy: Flicker Pinball Machines (electro-mechanical vs.
  - 1974 Demo for Bally Midway Management: Phase in & create their own microprocessor
  - Micro Games, Phoenix. AZ- Sprit of 76 (1<sup>st</sup> Microprocessor pinball machine: 1975)
  - Microprocessor Pinball Machines: 30% cheaper, lighter, & easier to service (market standard)
- Transistor-Transistor Logic (TTL)

# CH 4: THE MICROPROCESSOR SHAKES UP VIDEO GAMES

- Transistor-Transistor Logic (TTL)
  - Hardwire system: change = redoing circuit (soldering, etc.)
  - Limited sophisticated game play
  - Electric noise confused the logic
  - Simple Circuits: Holding back video games
  - Nutting Strategy: Transform video games in the same way as pinball
  - Intel 4004: Lack power to display images on TV
  - TTL Games Break out & Death Race (Atari)
- Death Race

# CH 4: THE MICROPROCESSOR SHAKES UP VIDEO GAMES

- Death Race
  - Exidy (Mountain View, CA): coined-operated business, licensing Destruction Derby
  - Destruction Derby competed with Demolition Derby (Chicago Coin): Lost \$\$\$\$
  - Death Race: Adapted from Destruction Derby to saved time and cost
  - Racing Game: Twist: Run over people and rewarded with points (GTA???)
  - Created out of necessity & defense of own product licensing: Media didn't agree
  - Frist major panic over video game content
- Controversy

# CH 4: THE MICROPROCESSOR SHAKES UP VIDEO GAMES

- Controversy

- Seattle, WA: Reporter interviewed a mother in an arcade? Responded that game is teaching kids to run over & kill people
- Paul Jacobs (Exidy's Director of Marketing): "People get a kick out of running down pedestrians you have to let them do it."
- Psychologist, Journalist & Politicians: "Dr. Gerald Driessen National Safety Council's Research Dept.) - Death Race was shift from watching violence to acting out violence in video games (1976/2014)
- Exidy's Argument: running over gremlins & Ghouls- did not work
- 60 Minutes & Threats (letters & bombs),

- The Fall Out

# CH 4: THE MICROPROCESSOR SHAKES UP VIDEO GAMES

- The Fall Out
  - At first, industry kept quiet
  - Height of controversy lasted two months/other stories prevailed
  - Increased Demand & Public Awareness for Death Race
- Intel 8080



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- Intel 8080 (1975)
  - Capable of controlling on-screen action of video game
  - Changes are accomplished through software
  - Nutting needed a video game: Western Gun (2<sup>nd</sup> game by Tomohiro Nishikado)
  - Western Gun: Pitted two-players against each other in a showdown
  - Bally Midway: Had North American rights to Western Gun (Taito)
- Video Game Development

# CH 4: THE MICROPROCESSOR SHAKES UP VIDEO GAMES

- Video Game Development
  - No longer engineers with soldering irons
  - Computer programmers writing code
  - Jay Fenton & Tom McHugh: Student volunteers (University of Wisconsin)
  - McHugh: Main programmer for Gun Fight (1975)
  - Marcine “Iggy” Wolverton (1975): President of Midway, purchased 60% of Intel’s 8080 chip (\$3 million)
- Atari

# CH 4: THE MICROPROCESSOR SHAKES UP VIDEO GAMES

- Atari
  - Major success with Breakout (1976)
  - Birth out of positive work environment
  - 3 day Retreats: Resorts & Ocean
  - 1 Rule: All ideas can be put on the table without criticism but anyone can elaborate or enhance the idea.
  - Breakout: Bat-and-ball format applied to smashing bricks (Bushnell)
- Pre-Apple & Pre-Microsoft

# CH 4: THE MICROPROCESSOR SHAKES UP VIDEO GAMES

- Pre-Apple & Pre-Microsoft
  - Steve Jobs & Steve Wozniak (Apple): Worked on Breakout
  - Jobs given bonus if kept costs low/ Wozniak got half of Jobs' bonus
  - Jobs & Wozniak cut amount of integrated circuits in half
  - Wozniak prototype never used: too complicated
- Altair 8800 (1975/76)
  - Very first microprocessor-based home computer/LED lights, 256 bytes of memory, and bank of switches
  - Bill Gates & Paul Allen (Microsoft): Wrote version of BASIC programming language for Altair
  - Dave Shepperd: Made games for system, integrated video system and electric typewriter keyboard (replace toggle switches)
- Atari

# CH 4: THE MICROPROCESSOR SHAKES UP VIDEO GAMES

- Atari
  - Shepperd starts working for Atari in February 1976
  - Disappointed: No State-of-the-Art facilities/Did not matter, excited about making games
  - Flyball: First project but did not test the capability of the microprocessor
  - Night Driver: POV-Drivers seat/ flat horizon grow bigger as they got closer& disappeared
  - Introduced the “first-person perspective” driving games
  - Illusion of fast movement
- Future: Microprocessor alters home video games



# CH 5: COMPUTING GAMING FROM MAINFRAMES TO THE HOME

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- Computers
  - Video games thriving in this arena
  - Commercial Pressures: There wasn't any
  - Problems: limitation of the computers-teleprinters
- Teleprinters
  - Printing: 30 characters per second on 80 character wide print paper
  - Simple games: Non-action games (tic-tac-toe, hangman, Battleship, etc.)
- New Games

# CH 5: COMPUTING GAMING FROM MAINFRAMES TO THE HOME

- **New Games**
  - Highnoon, USS Enterprises, Summer Game, Hunt the Wumpas, Lunar
- **Simulations: Text-and-Turns**
  - Don Daglow's (1971): Baseball- mathematical calculations
  - Joseph Weizenbaum (1966)- Eliza (Doctor) Virtual Psychotherapist
  - Will Crowther (1976): Adventure: Created a world in the player's mind
- **Administrators**



# CH 5: COMPUTING GAMING FROM MAINFRAMES TO THE HOME

- Administrators
  - Regularly deleted the games of their computers
  - Few games survived during 1960s & 1970s
  - DECUS (Digital Equipment Corporation User Society): Games survived because of reformatting and republishing in computer hobbyist magazines
  - Adventure making the rounds (workplace & universities)
- Stanford University (1977)

# CH 5: COMPUTING GAMING FROM MAINFRAMES TO THE HOME

- Stanford University (1977)
  - Don Woods (medical student): Worked in the AI lab, intrigued by Adventure game
  - Adventure: puzzles and storyline
  - Got permission from Crowther to reprogram the game
  - Woods: changed layout, added new puzzles & randomness
  - Robert Pariseau: Contribution- maze of indistinguishable caverns
- New Adventure Game

# CH 5: COMPUTING GAMING FROM MAINFRAMES TO THE HOME

- New Adventure Game
  - Generated new interest in text adventure games
  - Dynamic Modeling Club (MIT): Tim Anderson, MarcBlank, Bruce Daniels, & David Lebling
  - Imlac PDS-1: Graphics, Windo-style interface, Lightpen vs. mouse, foot pedal to click
  - Steve Colley & Howard Palmer (1973): Maze- 3D First-person perspective, escape maze,
  - Pre-dated (1974): multi-player, online FPS, & death matched games (1974) Doom
  - Greg Thompson & Howard Palmer: linked two Imlac computers together, two people could chase each other around the maze shooting at each other
  - Zork: Improved upon Adventure, text only, new fantasy world, complex sentence structures (no two-word) ,
- Dungeons & Dragons (DD)

# CH 5: COMPUTING GAMING FROM MAINFRAMES TO THE HOME

- Dungeons & Dragons (DD)
  - Fusion of tabletop war games, Lord of the Rings Books, & mature dramatics
  - Tools- Complex statistical rules & polyhedral dice
  - Design: Quests, running game, handle probability equations- determine game outcomes
  - Games: Each session lasted hours while each game lasted weeks
  - Problems: Slow gameplay, mathematical calculations
- Computers & DD

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- Computers & DD
  - Daglow: Created Dungeon (1975), Hard time getting players together for DD
  - Able to compute complex calculations
  - Speed up the gameplay
  - Simulate on computer
  - 20-30 seconds of screen change, visuals of maps with symbols (?,  $\Delta$ ,  $\pi$ )
- Kit Computers

# CH 5: COMPUTING GAMING FROM MAINFRAMES TO THE HOME

- Kit Computers
  - Home Computers: Altair 8800 & KIM-1
  - Small and Cheap
  - Steve Wozniak (Breakout Atari): Built Apple I-connected keyboard to home TV, prototype showed to Steve Jobs,
  - Apple Computers (1976):
- Apple Computers

# CH 5: COMPUTING GAMING FROM MAINFRAMES TO THE HOME

- Apple Computers
  - Apple I: Over 150 computers,
  - Apple II: Color graphics, proper sound & connections, plug into TV, inexpensive
  - Mission: Apple II (1976) was built to play computer games, particularly Breakout, connecting game controllers
  - Jobs: Started searching for investor
- Commodore Business Machines



## CH 5: COMPUTING GAMING FROM MAINFRAMES TO THE HOME

- Commodore Business Machines (1955)
  - Jack Tramiel (1955): Formed Commodore- typewriter repair shop(Bronx, NY)
  - Commodore: transformed into leading manufacture of office equipment
  - Chuck Peddle (engineer): Trying to persuade Tramiel to get into home computers
  - Greedy Jobs: Asked for several hundred thousands of dollars/shown the door
  - Commodore decided to make its own home computer
- Other Investors

# CH 5: COMPUTING GAMING FROM MAINFRAMES TO THE HOME

- Other Investors
  - Atari: Nolan Bushnell & Joe Keenan- outside their area
  - Atari's VP of Engineering: Don Valinetine- said no
  - Ex Intel Employee: Mike Markkula- decided to invest
- Competitors vs. Apple
  - Commodore PET (\$599): beat Apple to market/ all-in-one, 3 million pre-orders
  - Tandy TRS-80: Radio Shack
- Apple's Results

# CH 5: COMPUTING GAMING FROM MAINFRAMES TO THE HOME

- Market Results
  - Apple II: 23%- smallest company but video game inclusion of color graphics
  - Tandy TRS-80: 16%
  - Commodore: 10%
- Computers
  - Now located in people's homes instead of universities
  - Early home computers primarily used for playing video games
- Video Game Migration

# CH 5: COMPUTING GAMING FROM MAINFRAMES TO THE HOME

- Video Game Migration
  - Magazines & Books
  - Listed computer programs
  - Enter code line-by-line
- Video Game Software & Retail

# CH 5: COMPUTING GAMING FROM MAINFRAMES TO THE HOME

- Video Game Software & Retail
  - Microchess (1976): Micro-Ware, KIM-1
  - The Oregon Trail: 1971 game, 3 student teachers (popularity extended into the 1980s-1990s)
  - Dog Racing: Scott Adams on a TRS-80 computer, Radio Shack (Manny Garcia), 50 orders , set outside vs. caverns
- Memory Issues
  - Home computers had 16k of memory
  - Adventure used 256k of memory
- Memory Tricks

# CH 5: COMPUTING GAMING FROM MAINFRAMES TO THE HOME

- Memory Tricks
  - Scott Adams: Figured how to fit his game on 16k memory computer
  - Got computer to recognize players commands based on first 3 letters
  - Cassette tapes & 5.25 in Floppy discs
- Newcomers to Industry
  - Bill Budge (student/ Berkeley University)- wrote simple games and sold to Apple (Penny Arcade, 1979)/Stoneware (\$7000 checks)
  - Marc Blank & Joel Berez: Chopped up Adventure into three parts to put on home consoles
  - Ken & Roberta Williams: Ken programmed/Roberta designed- Murder Mystery Game
- Game Design

# CH 5: COMPUTING GAMING FROM MAINFRAMES TO THE HOME

- Game Design: Robert Williams
  - Refused to bend to technology
  - Story, Character, & Game World
  - Before game framework, engine, interface,
  - On-Line Systems (Sierra Online): 3000 copies/\$24.95/6 months
  - The Wizard and the Princess
- Text-based Competitors

# CH 5: COMPUTING GAMING FROM MAINFRAMES TO THE HOME

- Text-based Competitors
  - Adams: integrated visuals
  - Infocom: stayed true to text
- Flight Simulators: Old School
  - Edwin Link Jr. (1929): Link Trainer-cockpit, motors, organs, recorded sounds/simulate flying
  - Second World War: USAF order 10k Link Trainers, trained 500k pilots
  - Commercial Aspects: Arms race
  - 1960s: movable cameras, scanned out over modeled landscapes in line with user's controls/replicated visual experience of flying
- Flight Simulators: New School



# CH 5: COMPUTING GAMING FROM MAINFRAMES TO THE HOME

- Flight Simulators: New School
  - Digital Realm: Improved effectiveness of flight sim & allowed amateurs to play
  - Bruce Artwick (physics student & pilot): Sublogic:- wrote Flight Simulator on Apple II debut in 1978
  - Flight Sims: Divided into Military & Civilian Sims
- Tabletop War Games

# CH 5: COMPUTING GAMING FROM MAINFRAMES TO THE HOME

- **Tabletop War Games: (Old School)**
  - Krigsspiel: Game created for Prussian Army in 18<sup>th</sup> Century for military training
  - Detailed soldier figurines kit, 60page rule-book, later updated with real military data
  - Credit for defeating the French in 6 Week War against Austria
- **Tabletop War Games: (New School)**
  - Chris Crawford (University of California): IBM1130, move from board games
  - Chris Crawford (1977): Tanktics (“Fog of War”)
  - Chris Crawford (1981): Eastern Front 1941(real-time conflict)
- **Role-playing Games**

# CH 5: COMPUTING GAMING FROM MAINFRAMES TO THE HOME

- **Role-playing Games**

- Richard Garriott (1977): Lord British, recognized game designer
- University of Oklahoma: seven-week summer course for high school students- programming, mathematics, & statistics/ Lord of the Rings & DD
- Return home and begin programming DD style game on Teletype
- ~1000 lines of code/ Father bet code 1/2 of the money on Apple II code would not work
- Game to work on PDP-11, which led to Ultima series

- **Ultima**

# CH 5: COMPUTING GAMING FROM MAINFRAMES TO THE HOME

- **Ultima**
  - \*= walls/space= corridors/ power sign = treasure
  - New map: wait 10 seconds for new map to print 10x10 map
- **Alakabeth (D & D 28b) & Apple II**
  - Goal: Added graphics, First-person POV
  - Computer Land: Started selling Alakabeth
  - California Pacific Computer (1980): Gave Garriott contract- 30k copies= \$150k
- **Alakabeth, Ultima: The First Age of Darkness**
  - Bigger success: Sold 50k copies
- **Competition**

# CH 5: COMPUTING GAMING FROM MAINFRAMES TO THE HOME

- Competition

- Sir Tech (1981): Wizardry: Proving Grounds of the Mad Overlord- better graphics, players leading a party of adventures rather than lone hero (out sold Garriott's games 2:1)
- Garriott (1982): Ultima II: The Revenge of the Enchantress- players were able to talk to & fight computer characters
- Texas Instruments (1982): replaced black & white drawings with solid color tunnels
- Sir Tech (1982): Wizardry: The Knight of Diamonds: Allowed players to import their characters from the first game
- Garriott (1983): Ultima III: Exodus

- Game Publishing

# CH 5: COMPUTING GAMING FROM MAINFRAMES TO THE HOME

- Game Publishing (1983)
  - Legitimate business
  - Home computers: freed games from academia to entertainment
- Dawn of 1980s
  - Still focused on arcades & game consoles