

Adventure as a Video Game: Adventure for the Atari 2600

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Context

*This essay is a revised version of Chapter 3 from my unpublished book manuscript *Inventing the Adventure Game*, which I wrote in 1983-'84. I had designed the games *Adventure for the Atari 2600* videogame console (developed during 1978-'79) and *Rocky's Boots* for the *Apple II* personal computer (developed during 1980-'82). *Inventing* was a design history of these two commercial games. For *The Game Design Reader*, I added a brief introduction.*

Game Design Models

Game Spaces

Warren Robinett in 1979 designed the first action-adventure video game, *Adventure*, for the Atari 2600 video game console. He cofounded the Learning Company, and there designed the educational simulation *Rocky's Boots*. He did research in virtual reality at NASA and University of North Carolina, and now works at Hewlett-Packard Labs on fault-tolerant computing for nano-electronics.

Introduction

Game designers decide what ideas to develop based on the milieu of the time they live in—the hit games, the cool new ideas, the technical tricks for exploiting the hardware, the user interface techniques, and so on. The art of interactive game design was evolving as new ideas were discovered, and these two games of mine were links in the chain. Adventure for the Atari 2600 was directly inspired by the original text game Adventure created by Willie Crowther and Don Woods. (Chapter 2 of Inventing the Adventure Game was about this game.) Rocky's Boots (Chapter 4 of Inventing) was, for me, a logical further development of the ideas in the Atari 2600 Adventure. Many subsequent designers found the concept of the adventure game worthy of further exploration and development, producing what we now recognize as the genre of adventure games. Chapter 3 is thus a contemporaneous report, from the dawn of the video game era, on the creation of the adventure game genre. My website <WarrenRobinett.com> has more information on the design of Adventure, including the complete text of the book manuscript.

For Chapter 3 to make sense in isolation, it is necessary to know something about the game that preceded and inspired my version of Adventure. Crowther and Woods's wonderful text adventure game (see <www.rickadams.org/adventure>) used no graphics at all—it was entirely text. Text described where you were: You are in a debris room filled with stuff washed in from the surface. A low wide passage with cobbles becomes plugged with mud and debris here, but an awkward canyon leads upward and west. A note on the wall says "MAGIC WORD XYZZY." Text described objects you could carry: A three-foot black rod with a rusty star on an end lies nearby. And text commands were typed by the player to move around and do things: GO WEST or TAKE ROD or SAY XYZZY. Chapter 3 describes how I adapted the adventure game concept from its birth medium (text descriptions of places and objects, typing text commands on a keyboard) to the video game medium (graphics, motion, animation, color, sounds, and joystick input).

The process of creating video games has changed almost beyond recognition in the 25 years since Adventure was created. It has morphed from an act of individual authorship, similar to that of a novelist, to the coordinated effort of a large team of

specialists, similar to that of making a movie. The resources available to the game designer (memory, computing power) have also changed enormously during this period, increasing by a factor of 1000 or more. It is therefore difficult nowadays to imagine the world that we game designers lived in back then.

The Atari 2600 was the first widely distributed video game console. After the success of Pong—the first mass-market video game—the Atari 2600 was the first home videogame machine meant to play more than one game. Different cartridges let you play different games. Today's Playstation, Xbox, and GameCube are direct descendants of the Atari 2600.

Back at Atari in the late 1970s, each game cartridge for the Atari 2600 console was created by one person. You had the idea, wrote the program, created the graphics, did the sound effects, chased down bugs, tested the game on kids, revised it until you were satisfied, and wrote a draft of the game manual. This made sense at that time, because with only 4K of ROM memory available to hold the game program, it took only a few months of programming to fill up the ROM. RAM memory was even more limited, with only 128 bytes available. (Current personal computers typically have 256 million bytes of RAM.) And not only was the memory extremely limited, but the processing power was also very limited—the Atari 2600 had an 8-bit processor with a 1.2 MHz clock speed. (Current personal computers typically have 1000 MHz clocks.) To top it off, the display hardware, although flexible, was also extremely limited, providing only two decent sprites for displaying moving objects on the screen. So you needed to start out with a game concept that was simple enough, in both graphics and gameplay, to fit into the tiny memory available. You programmed the game in assembly language. You counted bytes and machine cycles. You had to make every bit and every machine cycle carry its weight. Your job was to make the trade-offs, and come up with an interesting game, given these resources. The adventure game concept appeared to be too complex in fit into a 4K game cartridge. At least, my boss at Atari thought so. After all, Crowther and Woods's text adventure game ran on mainframe computers and required more than 100K of memory. But I thought I could do it.

Although Chapter 3 of my book is mostly about the intellectual aspect of Adventure—how I juggled the ideas and technical limits to make the game—behind the intellectual is the emotional: the motivation, the driving force. In my case, it was a

combination of passion and stubbornness, taking root in the Atari culture of that period, where designer/programmers were encouraged to have their own game ideas and then code them up. The passion came from perceiving new possibilities that demanded to be explored. The stubbornness was just one of my traits. I had to fight to create *Adventure*. And yes, it was a good idea. It did fit into 4K. The *Adventure* cartridge was marketed, and one million copies were sold.

I am proud of *Adventure*. I'm glad I was lucky enough to be there at Atari at that time, and to have played Crowther and Woods's game. I'm glad I had the idea of an adventure game as a video game, and that I had what it took—guts, training, tools, luck in navigating the political currents—to stay with it. I hope I've steered a middle course between false modesty and arrogance. In truth, it takes a certain amount of arrogance to even try.

When you come up with your own good idea for a game, think about it for a while. Not every idea is earth-shaking. If you really feel you have a good one, don't let the Big Guys stop you. (If, on the other hand, your big idea is another *DOOM* clone, please go stick your head in the toilet now, and flush.) The field of interactive games is still pretty young, and I believe there are many interesting directions that are still completely unexplored. After you read my story, get busy and make something cool.

—Warren Robinett, November 2004

Description of the Game

Adventure, a video game cartridge for the Atari 2600 video game console, was the first action-adventure video game. It was published by Atari Inc. in 1978, and sold 1 million copies.

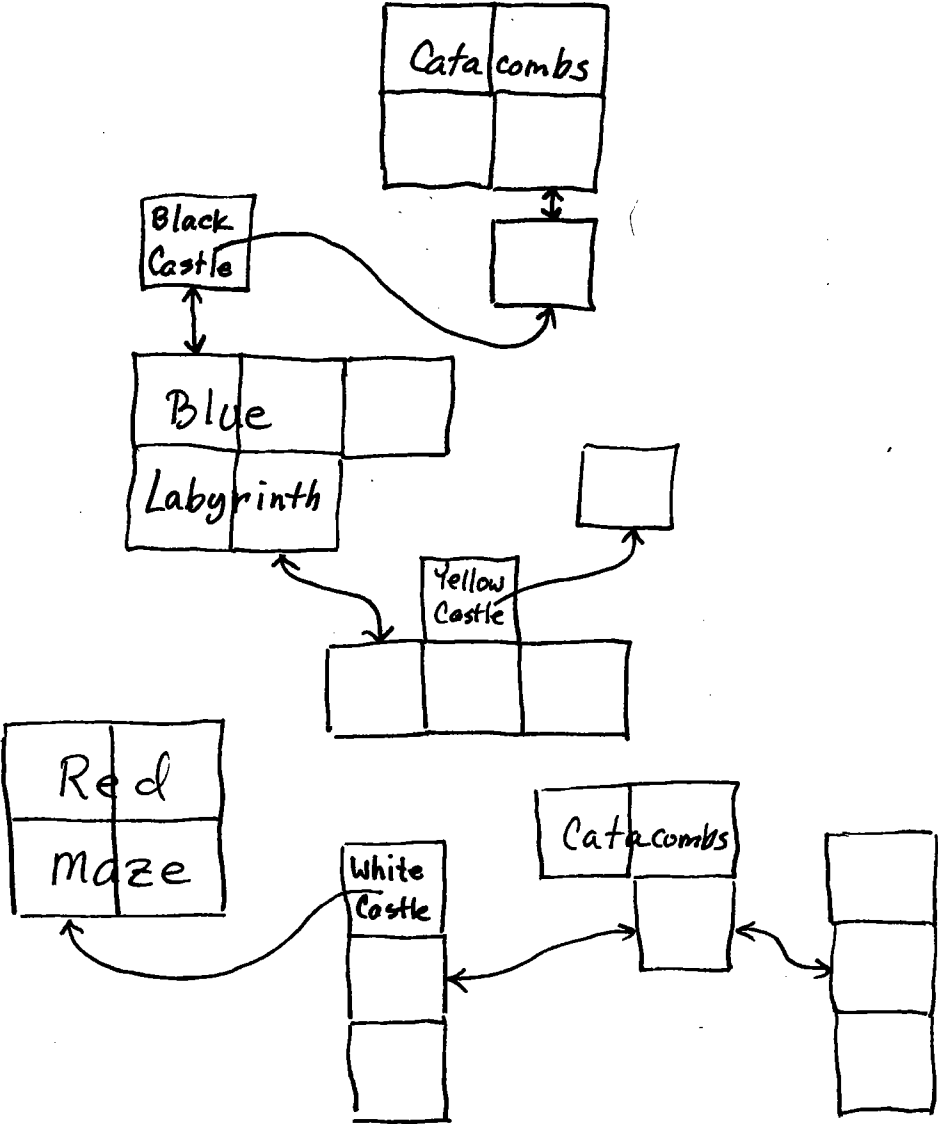
Adventure introduced the idea of movable objects (represented by visible icons) that could be picked up by the player (using a joystick) and moved from place to place in the game world. It was also one of the first video games to allow the player to explore a large multi-screen game world. As the first action-adventure game, it inspired the current genre of action-adventure video games, including *Legend of Zelda*, the *Ultima* series, and many others. *Adventure* also contained the first Easter Egg (hidden surprise) in a video game, which in this case was the author's signature hidden in a secret room.

I had played the new sensation, the original text game *Adventure*, when I finished designing my first video game. The time was June 1978, I worked for Atari, and my next order of business was to begin working on another game cartridge for the Atari 2600 home video game. I had a scheme for adapting the text dialogue of *Adventure* into a video game: use the joystick to move around, show one room at a time on the video screen, and show objects in the room as little shapes. I hoped the program to do this might somehow fit into the tiny (4K) memory available in a game cartridge, so, despite my boss's skepticism, my infatuation with *Adventure* swept me into a mad frenzy of programming.

A month later, I had a prototype: the player could move a small square "cursor" from screen to screen, picking up the little colored shapes to be found on some of the screens, which were connected edge to edge. And there was a pesky dragon that chased the cursor around, trying to eat it. Exhausted, I went on vacation, and found, on my return, that Atari upper management had decided that I should turn my fledgling adventure game into a video game about Superman. Atari's parent corporation, Warner Communication, owned the soon-to-be-released Superman movie, and a Superman video game could ride on the wave of "hype." I squirmed, and soon wriggled out of that assignment: my coworker John Dunn agreed to take over and turn the program into a Superman videogame, leaving me free to develop the same program in a different direction, namely, to continue with *Adventure*. (This sort of contrariness later caused Atari executives to label their video game designers "a bunch of high-strung prima donnas.") I moved forward, discovering how ideas from the text adventure game could be made to work as moving shapes in a video game, and discovering what the young tradition of video games could contribute to the new genre of adventure games. The program took eight months to complete start to finish; Atari marketed the cartridge, and since Woods' game was in the public domain, the video game, too, could be called *Adventure*.

This new videogame version of *Adventure* was a quest: the player started out beside the Yellow Castle with the goal of retrieving the Enchanted Chalice, which was out there somewhere in the network of thirty rooms. (See *Figure 1*). To make things difficult, three dragons infested the game, chasing the player from room to room, and trying to eat him. A giant bat also caused trouble, moving objects around and stealing things from the player. There were a number of useful objects. The sword killed dragons. The bridge let the player cross walls in the maze. The magnet sucked out objects that were stuck in the walls. The black, white, and yellow keys each unlocked a castle of matching color. (See *Figure 2*).

Figure 1: Map of the Network of Rooms



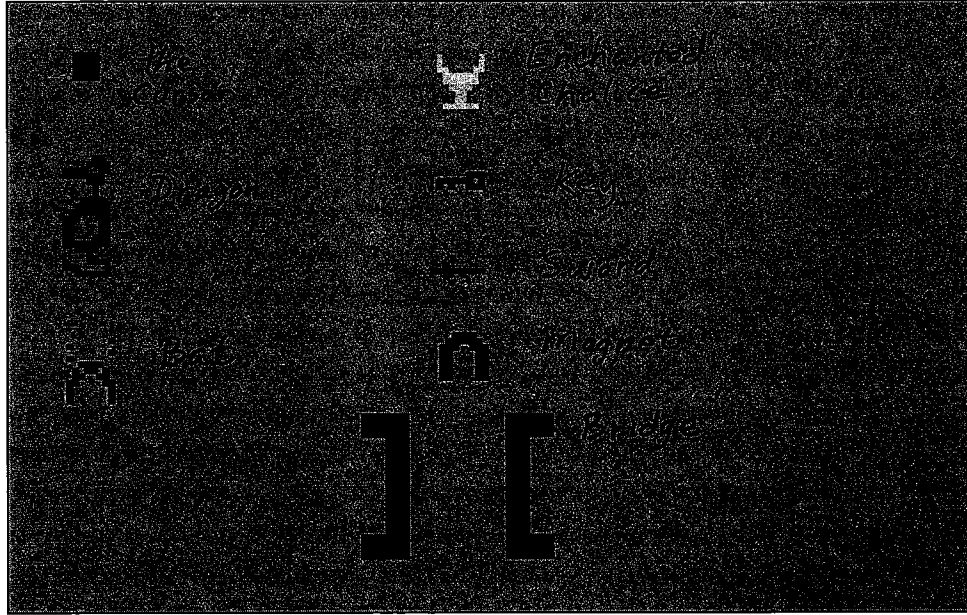


Figure 2: Creatures and Objects

Each of the three castles in Adventure had interiors composed of one or more rooms. The player entered a castle by moving through a doorway equipped with a portcullis, which could be raised or lowered with a key. When the portcullis was down, the castle was locked, and entering or leaving the locked castle was impossible. Each of the three castles had its own key object, and all the castles were locked when the game began.

This video game, Atari 2600 Adventure, was inspired directly by Crowther and Woods' text game, Adventure. I tried at first to create video game counterparts of features in the text game. The magic rod can create a crystal bridge to span an impassable crevasse in the text version; I tried a rod shape which that when it touched a maze wall, caused a bridge shape to appear. The "maze of twisty little passages, all alike" became a very confusing 8-room video maze. These direct transliterations from text to video format didn't work out very well. While the general idea of a video game with rooms and objects seemed to be a good one, the graphic language of the video game and the verbal language of the text dialogue turned out to have significantly different strengths. Just as differences between filmed and live performance caused the art form of cinema to slowly diverge from its parent, drama, differences between

the medium of animated graphics and the medium of text have caused the animated adventure game to diverge from the text adventure game.

Player Input

The adaptation of the adventure game to the video game medium required a radical change in the form of the player's commands to the game. Typing was not possible on the Atari 2600 video game console: the standard input was a joystick with one "fire" button on it. The video game player could push the joystick lever in one of four directions, or press the button. The text game player, on the other hand, typed in a two-word command, composed of an action verb and a noun. There were dozens of words in the text game's vocabulary, both for nouns and for verbs; in two-word combinations, there were thousands of possible commands. How could the video game player initiate the wide variety of actions that were possible in the text game?

The joystick was a natural for north-south-east-west movement. There is something satisfyingly responsive about shoving the joystick lever and having a shape on the screen move in the same direction. It is important that players can hold onto the single lever and move it in any of several different directions. The lever itself fades out of consciousness, and players feel that they are propelling the cursor with their own muscles, as if they were scooting a brick around on a sidewalk.

Indeed, players identify themselves with the shape they move around on the video screen. When they say, "I ran into a wall." they mean the shape they moved ran into a wall; they *are* that shape. In Atari 2600 Adventure, this self shape is a little solid-colored square. It can be called a "cursor," since its function, as a position indicator is similar to the rectangular blinking cursor found on word processing screens. I originally called it "the man."

Besides movement, picking up and dropping objects are the most important player actions in an adventure game. With the joystick lever assigned to movement, the single button on the base of the Atari joystick was the clear candidate for grappling with objects, although it wasn't clear exactly how the button should control taking and dropping objects. If the function of "take," for instance, was to be invoked when the button was pressed, which object should be taken? The graphical nature of the video game provided a solution to this. In the world of video games, objects on the screen usually interact only when they run into each other. This is called a "collision," and is defined as an overlap of one shape with another. The object shape to be taken could be specified by moving the cursor to touch it. In fact, the collision itself could invoke the pick-it-up action, which left the button free for dropping. But dropping

what? If several objects had been picked up, a selection was again needed. And how should the carried objects be shown? Although pushing the button could have called up an "inventory" screen, and the cursor could have been steered into the object to be dropped, a simpler solution was adopted. Only one object could be carried at a time, and that object was shown besides the cursor on the screen. Pushing the button dropped it.

This approach had several advantages. It was simpler, so the program was shorter. The screen always showed the room players were in, and what they carried; players didn't have to worry about their cursor being eaten by a dragon that came by while they were examining inventory. Of course, time could have been suspended during inventory view, but that didn't seem right for a real-time game. The limitation of being able to carry only one object gave players some interesting strategic choices: which object should they carry—the treasure or the weapon?

Since the object being carried was shown on the screen, it had a position relative to the cursor. Players could adjust the positioning of their held object. When exploring unknown dragon-infested territory, it usually made sense to have your sword out front, because simply holding a sword did not prevent a dragon from eating you—but poking the sword into the dragon did. For a dragon that was scared of the sword, it worked better to loiter near a room boundary, with a behind-the-back sword dangling into the next room, ready to make a swift stroke when the dragon came into striking range.

What about all the other actions that players might want to initiate in an adventure game? These, too, could be specified by touching objects together. For example, in a text game, one might command "KILL DRAGON." The corresponding action in the video game was to pick up a sword and touch it to the dragon. In a sense, the held object and the touched object were the analogues of the action verb and noun from the text adventure game.

A great variety of "commands" might be given if players had the right verb objects at hand. Placing the bridge object across a maze wall and going across it was equivalent to "CROSS WALL." Touching a key to a castle's portcullis commanded, "UNLOCK CASTLE." Bringing the magnet into a room to retrieve a sword stuck in the wall was like "ATTRACT SWORD." Thus the syntax of nouns and verbs in the text adventure had an analogue in a video adventure—a "syntax" of overlapping shapes.

