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Rochester Institute of Technology

A Thesis Submitted to the Faculty of
The College of Imaging Arts and Sciences
in Candidacy for the Degree of
Master of Fine Arts

***Live It!* - An Interactive Non-Linear Adventure**

by

Gedeon Maheux

&

Talos, Shu-Ming, Tsui

December 6, 1994

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We would like to thank our parents for their support, as well as the following individuals, without whom *Live It!* would not have been possible:

David Abbott	Mark Liflander
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Robert Keough	Jesus Ucar
Jennifer Kloiber	James VerHague

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**Foreword by
Talos Tsui**

To think of a topic for my thesis was not easy, it had to be something that I enjoy. If not, I would have been stuck with it for the rest of the year.

Two weeks before the thesis proposal was due, we had some friends visiting our apartment. During the conversation we talked about CD-ROM games currently on the market. We all agreed that the design of those titles and the game play was poor. That conversation had a greater impact on me a few days later.

During a phone conversation with my friend, Anne Marie Arbutiski, I got inspired about a storyline of a robot searching for a real life, like Pinocchio, but in different situations and environments. I also considered the possibility of a joint thesis. That night, I approached my roommate/classmate, Gedeon Maheux, about the whole idea. He thought about it for a day, and then agreed to be a part of it. We then approached the Interim Chairman of the GD Department, Robert Keough, to see if it was possible to do. The rest is pretty straight forward. First began thinking of this thesis approach I couldn't stop the excitement within myself. This thesis would provide me with all the elements I enjoy and also enable me to stretch my creativity, using animation, three dimensional modeling, image manipulation, and most importantly, story telling. It allowed us to input different messages into the game.

The release of *MYST*, an interactive CD-ROM game, in early October had a very important impact on our goals, since it was created in HyperCard by using X-command (an advance scripting language for certain multimedia programs). The scenes in *MYST* were all created in a three dimensional program and game play was very intelligent. That was the most outstanding game we had seen so far in the market. However, the storyline was linear.

Our goal is to create the first true non-linear interactive adventure with a story that can branch out to many possibilities, enabling someone to play it many times, with an outcome that is never the same.

This project was not easy to accomplish, and I think we did a great job. Thank you, Gedeon, for doing this thesis with me. My wish now is to see this game on the shelf in computer stores. I hope *Live It!* will make a new impact into the entertainment market.

Foreword by Gedeon Maheux

Ever since I bought my first Apple IIe, I have enjoyed playing computer games. The first games that were available were not much more than small blips on a low resolution monochrome monitor. The games I played on my computer were fun, none-the-less, because they challenged me and offered hours upon hours of fun and exploration.

Today, many of the principals that made these early games great have been lost on today's game players. Video systems such as Sega and Nintendo, as well as most (if not all), of the entertainment available on CD-ROM, have focused on the improvement of graphics and sound. Today we have fully rendered three-dimensional backgrounds. We can "speak" with animated characters that seem to have a mind of their own, and respond to our questions as would any living individual.

With these incredible advancements in the technological area of game design, we would expect to see the level of involvement for the game player increase. Instead, we have seen just the opposite - games that involve us visually, but not mentally. We may spend great amounts of time marveling at the graphics and spend a few minutes solving the puzzles. In addition, after we have walked through this arena of the senses once, we have finished the game completely. We can never return because the game is exactly the same the second, third and fourth time through.

In creating *Live It!* we wanted to break down the walls that had been built up by the many game designers that came before us. The designers that think playing once is good enough, and that killing the player's character is the road to extended game play time. By challenging this, I feel we have made a statement about the possible future of computer game design. The old arguments of limited storage space and slow processors will no longer be valid. When the technology develops to the point where game designers will have unlimited space and unlimited speed, will they know what to do with it? After working on *Live It!* I know I will. We have created a world, a universe that is worthy of today's game players, and I am proud of what we have accomplished. I hope this report will bring a better understanding of game design to both players and designers for years to come.

Why did we create *Live It!* ?

In recent years, the state of computer graphics for applications to education and entertainment has increased considerably. The people involved in designing multimedia applications such as CD-ROM interactive games, have produced products that make use of high quality graphics and sound. The game play, however, is usually quite limited and predictable. We wanted to create a prototype that would demonstrate that interactive adventures need not be limited to the choices of the game designers, but could instead be dictated by the player. We set about creating a game that was intuitive, educational and dealt with issues on a social level.

Why a joint thesis?

Creating a game of this scope, both in technical and conceptual terms is a monumental task that usually takes a team of designers, programmers, musicians, and artists several years to complete. Even though we knew we were only constructing a prototype, the work load for a single individual on a project such as this would have been insurmountable. In addition, we both have similar interests in game development, and we enjoy working together.

What makes *Live it!* more dynamic than existing games?

In real life we make choices every day that affect our futures. In creating *Live It!* we wanted to carry that experience over to the realm of the computer. By empowering the player with the ability to make choices that would take him/her on different paths, we have created a game that changes every time you play. If a player wished to play a second, third or fourth time, she/he is able to take a completely different approach to the problems encountered. Upon completion of each storyline, the player will have experienced different issues, encountered different characters, and solved various logic and social puzzles.

Game Creation

What is a game? Traditionally, games have been activities that people engaged in to amuse themselves. From ancient times people have created games and puzzles to amuse and challenge each other. Over the centuries, the methods and media for game playing have changed a great deal, but the basic concepts and principals have remained similar.

We are probably most familiar with the types of games that take the form of athletic competitions. The ancient Greeks competed in athletic competition which we know as the Olympics. The Olympics were (and are) an opportunity for individuals to test their skills and abilities against others. These tests of the human body allowed people to find their potential, and enjoy themselves in the process. Today, people engage in a wide array of athletic competition ranging from baseball, soccer, and golf to mountain climbing, skydiving and race car driving.

However, athletic competition is just one type of game. Games can be broken down into three major components: games, simulations, and instructional. These three components can then be combined into new categories such as simulation games, instructional games, and instructional simulations (see figure 1a). An example of an instructional game would be a game that allowed children to learn as they were playing. An example of a simulation could be the numerous types of war simulations that are run by the military time and time again to determine the victor in land and sea battles.

Types of Games and Simulations

Games and simulations can be further broken down into more familiar titles and subjects. With few exceptions, all games and simulations fall into one of the following categories:

Athletic Games	Video Games
Board Games	Puzzles
Card Games	War/Technical Simulations
In-Basket Exercises	Computer/Educational Games

However, some games do not fit neatly into a single category. Games such as Chess and Checkers are considered board or strategy based, yet they have their origins in war simulations. In many cases, video games take on the attributes of many, if not all of the other categories.

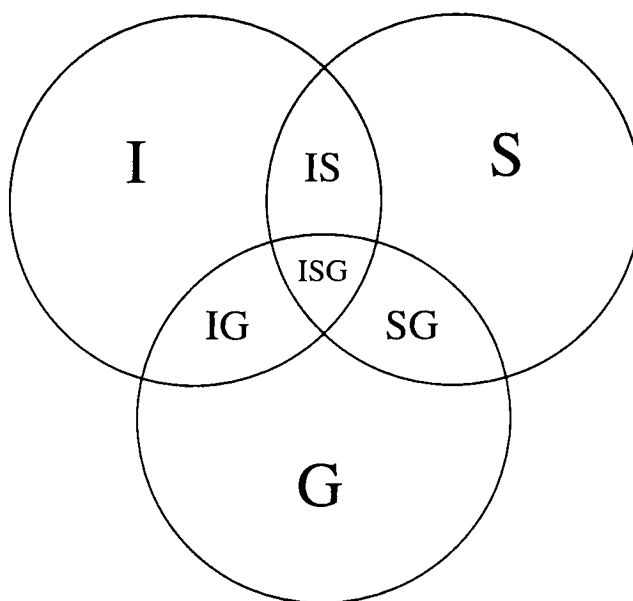


Figure 1A

In the figure above, I = Instructional, S = Simulation, G = Game. There are times when the three overlap and create hybrids such as Instructional/Games, or Instructional/Simulations.

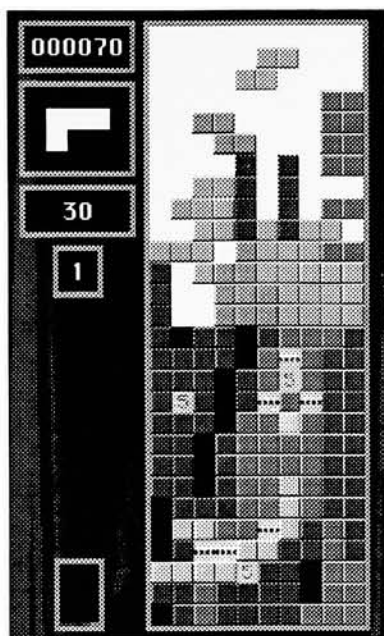


Figure 1B

In-Basket Exercises

In-Basket exercises are typically known as group or team games and usually center around member cooperation. Typically these economic games or simulations use team members which have been given a pre-determined amount of "money" to buy or sell with. In-basket exercises are typically instructional in nature and are not usually conducted for pure enjoyment.

Video Games

Video games can range from electronic versions of athletic competitions to complex aircraft simulations to even a new type of board or puzzle game. A common example of a video based puzzle game is the popular Tetris (see figure 1B). Tetris challenges the player to stack rows of geometrically shaped blocks as they fall from the top of the screen to the player's pile at the bottom. If the player stacks the blocks neatly, without gaps, he/she is rewarded with bonus points. The game ends when the player can no longer find empty holes for the blocks and the player's stack reaches the top of the screen. As with most video and computer based games, the difficulty increases as the player moves further into the process of the game.

Puzzles

Puzzles are probably one of the most familiar types of games in our society. Puzzles can be broken down into several categories including: word or letter based, mathematical, and logic based. Familiar examples of word or letter based puzzles are word searches and crossword puzzles (figure 1C). These puzzles depend upon the player's knowledge of the language and his/her ability to follow established conventions in order to solve the puzzle in question. Similar treatments are required for math and logic based puzzles. These types of games are more commonly known as riddles or brain teasers, and depend heavily on the player's ability to draw complex relations between two or more elements.

Simulations

Simulations depend more upon "real world" scenarios than other games do. By definition, a simulation is an experience that is designed to mimic or simulate, as close as possible, a reality based event. Simulations can range from the predicted growth of a child's lemonade stand, to the highly complex and super-accurate equipment used by commercial airlines to train their pilots. Since the invention of the computer, the development of entertainment and instructional simulations has advanced considerably.

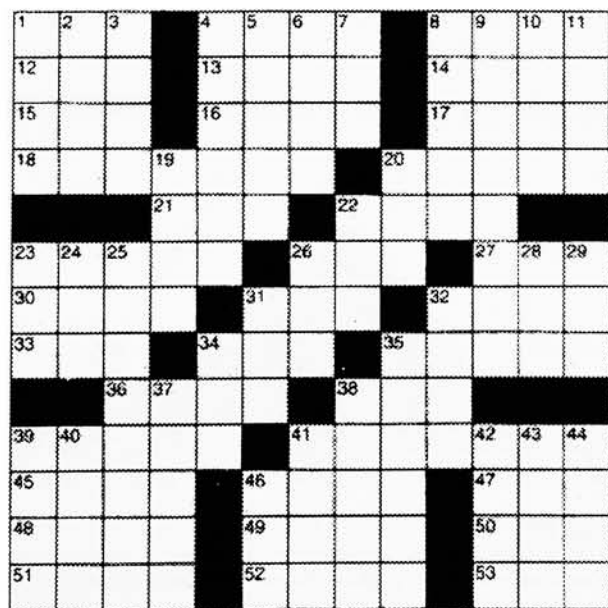


Figure 1C

Structural Components of Games & Simulations

No matter what type of game or simulation is being experienced, the player expects certain guidelines. For instance, in order to have a fair and enjoyable game experience, there must be some form of rules. The player also expects the game to have a definable goal or reward at some point along the journey. The goals of competition based games are to defeat the opponent, be it an individual or a team. Chess, Checkers, Monopoly, many card games, etc. focus on these types of goals.

Typically the goals for an interactive adventure on CD-ROM involve rescuing someone, finding lost treasure, staying alive, solving a puzzle or killing enemies. Game goals such as these have their basis in classic story telling and popular archetypes. The archetype of the "Hero Journey" is an example of one classic theme in many of today's CD-ROM adventures. The age-old story of a brave individual taking on a long and dangerous quest in search of something that is not immediately available to him or her has become a typical motif in the game industry. Indeed, *Live It!* is a variation on this archetypal story. In this case the hero is a robot in search of courage, love and other human psychological needs.

The goal of a computer simulation may not be to defeat an opponent, but rather to learn how to pilot a helicopter or fighter jet. Goals for simulations, be they game or instructional, have a wider range of purpose. The goals of most simulations are often educational in nature. Even when a simulation's main goal is the enemy's defeat (as is the case with the simulation/game *Artillery*), there is still learning involved (see figure 1D). Because simulations are based in "real world" events, the player may be able to make a connection between the simulated events and the actual mathematics, sciences, and machinery behind the simulation.

The following page contains a list of components of an instructional simulation/game. All of these components may not apply to every type of simulation or game. Some elements are more prevalent in certain game media, such as CD-ROM based games.

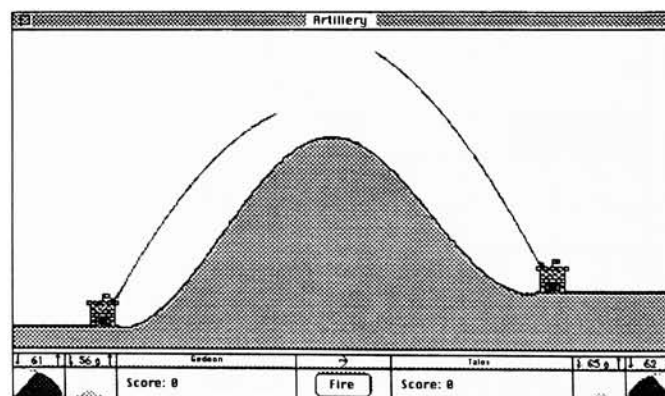


Figure 1D

Artillery is a simulation game that combines the fun of defeating the opponent with real world physics. Players must learn about gravity, momentum, and trajectories to accomplish their goal of destroying the other player's castle.

Possible Structural Components of an Instructional Simulation/Game

source: Charles Plummer

<u>Component</u>	<u>Definition</u>
Scenario	A narrative description of the initial situation or general context.
Objectives	The goals each participant seeks to achieve.
Rules	Prescribed guidelines that specify permitted behavior, interaction, and the handling of emergent situations.
Roles	Descriptive expectations assigned to participants upon which they pattern their behavior.
Phases	The major stages of operation of the simulation. Major phases include set-up, orientation, operation, debriefing, and evaluation. Iterations: the sequence within a given round or cycle of play may include initiation, decisions, actions, feedback
Action Tasks	Some stimulating event or problem introduced during the course of play to focus participant's attention on some aspect of the situation.
Interrelationships	Part-whole relationships involve the dynamic flow of information, resources, decisions, and the key interdependencies among elements.
Feedback and Progress Monitoring Systems	Methods and procedures to keep records, score, account for resource levels, and overall displays to continually inform participants and operators of current status with respect to goals, conditions, resources, and/or elapsed time.
Conditions Indicators	The form of verbal, numerical, physical, or symbolic representations of overall conditions of the whole and the parts.
Materials	All tangible physical objects necessary for simulation enactment.
Equipment	Technological devices that support simulation enactment.
Debriefing	Guidelines for operator to use to structure participant's processing of events and reactions, analyze dynamics, and transfer and generalize to the criterion referent.
Evaluation	Procedures to collect information on processes and outcomes to facilitate decision-making on theory, design, enhancing operation, and/or achieving intended outcomes.

Structural Components of Experience Based Adventure Games

In recent years, there has been a shift away from traditional style arcade and action games. With the advent of CD-ROM technology, designers were able to make a shift away from the crude graphics and sound of the early Atari, Nintendo and PC games. CD-ROM allowed for fluid animations, full color, fully rendered environments, rich high quality sound, and a more complete game world. Roles and game goals shifted away from "shoot 'em up" tasks, to puzzle and so-called "plot oriented" tasks. Despite the technological changes, these "Interactive Movies" (as they have come to be known), still follow a set of criterion similar to traditional arcade games.

There are roles, rules, goals and criteria that must be followed in order for the player to have a meaningful game experience. The primary difference between the old style arcade games and CD-ROM based adventures is the addition of a new factor, the ability to interact directly with computer generated characters and environments. Computer game characters were once cardboard cutouts that were either window dressing, or were designed to tell specific, unchanging information about the game situation. Today, some characters in CD-ROM based games actually respond to speech, and moreover, certain words called key words. When the player makes a reference to these key words, he/she may receive information that was not previously explained. In addition, with the advent of full motion video on the computer screen, players no longer see crude computer illustrations of characters, but may see actual captured video images.

With these new tools, game designers have had the ability to create games and simulations that range far beyond what has been perceived as "the limit" of gaming. It is now possible to take advantage of the increased variables and design an environment that changes and grows with the player, with the player's experiences. Yet, designers have *not* taken advantage of these tools. They have created characters and stories that are linear in nature. They have made universes full of two-dimensional characters that we care very little about, and have designed rules, and goals to be so inflexible as to turn away players in disgust.

The following page contains a list of two types of games or simulations. The first is a list of externally parametered conditions. These factors are associated with games that have a low level of intuitiveness, and which the player can do little to change. The second list is the reverse, an internally based system where the player has more range of freedom and the game is less structured.

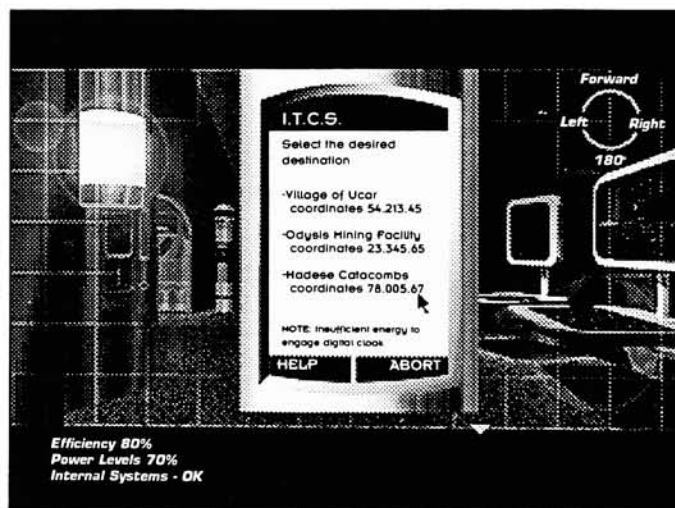


Figure 1E

From the very start, Live It! presents the player with several choices that empower him/her to alter the course of the game. This internally parametered system is lacking in most of today's CD-ROM based entertainment.

Structural Elements and Design Characteristics of Experience-Based Systems

source: Charles Plummer

	Externally Parametered	Internally Parametered
Roles	assigned rigid low ambiguity simple	emergent flexible high ambiguity complex
Interactions	channels specified patterns prescribed low ambiguity few channels available predictable	channels emerge patterns emerge high ambiguity multiple channels available unpredictable
Rules	prescribed fixed constant low ambiguity specified	prescriptive flexible changing high ambiguity emergent
Goals	imposed uniform single clearly defined	emergent individual multiple ambiguously defined
Criteria	predictable uniform single likely to involve "winning" clearly defined	unpredictable individual multiple unlikely to involve "winning" ambiguously defined

The Development of the Video Game

Many factors have influenced the development of video games as we know them today, not the least of which is public opinion. From the simple blip on the screen in the past to high resolution images we see today, the types of games have basically remained the same. The first true video game was called *Computer Space*, and was invented by a man named Nolan Bushnell. *Computer Space* like its next of kin, *Pong*, was nothing more than large slow moving blips on the screen. Being in the arcade along side pinball machines and other amusement devices of the time gave the video game life that quickly flourished.

In the years to follow, games like *Space Invaders*, *Asteroids*, *Zorf* and *Pac Man* would solidify the appeal of the video game in American culture. The games soon moved beyond monochrome displays to 4-bit color. With color, designers could add another dimension to game play. Faster processors meant faster play, and more exciting game challenges. Games like *Pac Man* and *Ms. Pac Man* let users play a number of levels.

With the economic collapse of Atari in 1982, home video game systems seemed doomed. Atari had been the single largest supplier of video game cartridges. When Atari could simply not move any of its merchandise, many in the industry felt that the video game craze was over. However, home computer games boomed in place of Atari's home video games.

Further advances in data storage and on-screen graphics made it possible for the video game to enter home markets with such computers as the Apple IIe, the Commodore 64 and the TRS-80. Not long afterwards, IBM jumped into the game market and was soon to become the largest and fastest growing market in the home computer game revolution. Diskettes slowly became the storage medium of choice. With the birth of the Macintosh computer in 1984, 3.5 inch floppies began the slow road to acceptance and gradually replaced the old 5.25 inch floppies.

In time, advances such as 16-bit and 32-bit systems enabled companies to, once again, spark interest in the home video game systems. Today Sega and Nintendo are the two largest suppliers of video games in the world. With the advent of CD-ROM technology, designers now have, what seems like, unlimited space. Virtual reality is slowly becoming popular, and computers keep getting faster and faster. Video games in the early 70's established the beginning of that craze, but we have by no means reached the end.

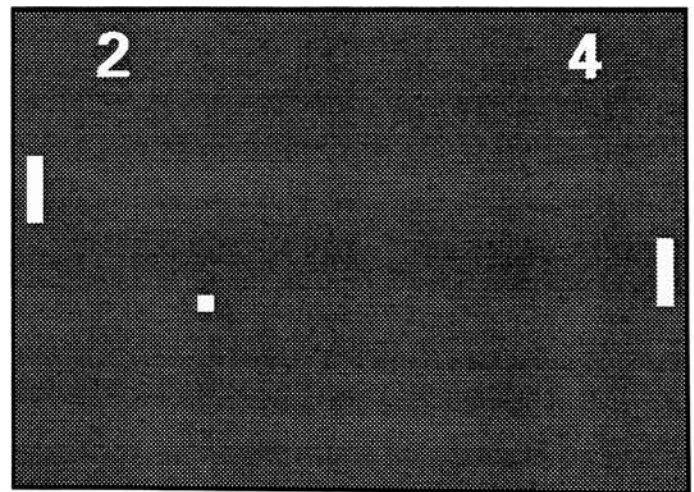


Figure 1F

Games like *Pong* served as the starting point in a long line of video and computer games that have led up to developments like *Tetris*, *MYST* and "Live It!"

- 1966** - Ralph Baer comes up with idea for TV-based video games.
- 1970** - Baer patents the Television Gaming and Trading Apparatus. An early version of video game.
- 1971** - Nolan Bushnell invents first arcade video game, *Computer Space*.
- 1972** - Magnavox ships Odyssey home game system based on Baer's work. *Pong* arcade game released.
- 1975** - Atari releases home version of *Pong*.
- 1976** - Fairchild Instrument and Camera Corp. releases first programmable home game machine and Coleco releases Telstar home game system.
- 1976** - Atari releases *Breakout*, designed by Steve Jobs to arcades.
- 1977** - Atari releases Video Computer System (VCS), which starts video game boom.
- 1978** - Astrocade and Magnovox's Odyssey2 are released. *Space Invaders* hits U.S. arcades from Japan.
- 1980** - Mattel Electronics releases Intellivision. Atari releases Asteroids to arcades and *Pac Man* hits U.S. arcades from Japan.
- 1981** - Employees leave Atari to form Imagic and Activision.

Diskettes were in the final stages of overthrowing cassettes as the consumer's medium of choice for data storage.

Attorney Doug Carlston used a TRS-80 to design *Galactic Saga*. He and his brother Gary formed Broderbund.
- 1982** - Bottom falls out of Atari market.

Trip Hawkins formed Electronic Arts and signed up some of the most talented designers of the day.
- 1983** - Nintendo introduces NES to U.S.
- 1985** - The era of IBM computer gaming has arrived and Commodore introduces Amiga computer.

- 1986** - Philips announced CD-I standard.
- 1989** - NEC released "16-bit" TurboGrafx system in U.S. and the first wave of modem-to-modem games became available.

Activision's *The Manhole*, produced by CYAN, was the first CD-ROM entertainment software to be released.
- 1990** - Sega released the Genesis 16-bit system in U.S. and icon-driven "point and click" interfaces began to proliferate.
- 1991** - Nintendo's SuperNES arrived in U.S.

Commodore released CDTV to U.S. market. Sega CD hit the shelves.

Digitized images and film sequences were used for the first time in computer games. Painted backgrounds became popular as a means of speeding up production.
- 1992** - CD-I players introduced in U.S. market.
- 1993** - 3DO machines start shipping.

Broderbund ships *MYST*, produced by CYAN for the Macintosh platform.
- 1994** - Atari Jaguar System and Sega Genesis 32X adapter start shipping.

Live It! was created by Talos Tsui and Gedeon Maheux for the Macintosh platform.
- 1995** - Sony PlayStation will be introduced.

Source: New Media Magazine
November 1993

Violence In Game Design

Since the invention of the video game, an overwhelming percentage of the games have dealt with violent themes. One of the first two successful video games, *Space Invaders* and *Asteroids*, allowed the user to either blow up objects or "kill" cyber aliens threatening earth. This is a natural progression, however, when one considers that the basic themes of strategy games such as Chess, Backgammon, and Checkers all have roots in the "War" mentality.

Video games took the theme of war hinted at in Chess, and gave designers and players the ability to further visualize violent acts. Atari's *Combat* and *Battle Zone* were primitive, but the player was able to fire imaginary shells at the opponent with devastating results.

In recent years, the level of violence contained in video games has taken an alarming jump. Games such as *Street Fighter*, *Mortal Kombat*, and *Doom* all rely on the player's willingness to kill and wound enemies in ever increasing numbers. In creating *Live It!*, we wanted to get away from the "Shoot 'em up" theme that seems to pervade current game design. *Live It!* offers an alternative for an audience that enjoys looking and experiencing as much as interacting with the environment.

Gender Bias In Game Design

In addition to violence, gender bias in game design has been prevalent since the time it was first possible to recreate the human form in video games. Only in the last five years has the primary target audience for video games been other than males ages 16-25. In recent years, game designers have realized that a significant portion of the computer users in the country are female, and that most, if not all, games were biased toward a male user. Typically, these games featured a male hero, out to rescue the "damsel in distress". This mind set began to change however with the introduction of *Tetris* in 1989. The industry became aware that the market did not have to be targeted towards males only.

Tetris was the first in a series of games that have come to be known as "Puzzle Video Games". These also included *Quix*, and *Klax*. In these games, the objective is not to destroy an enemy, but rather to solve an ever changing (and increasingly difficult) situation or puzzle. These games, by their very nature, were not biased toward either males or females. In addition, Tetris became one of the most popular video games in history, and has spawned many "copy-cat" games.



Figure 1F

Some video game designs focus solely on violence and the action associated with big budget movies. Players of "Doom" navigate a series of tunnels and rooms while using weapons such as machine guns and chainsaws to kill and maim the enemy.

Children and the State of Computer/Video Games

Children today are very lucky - a great deal of what they own is well designed, from accessories, to shoes to toys. Children's toys range from \$5 to \$300. Because of improvements in technology, children who have access to this technology can now learn how to interact through video games.

Children tend to sit in front of the television screen for hours. Like playing "Cops and Robbers", it is a child's way to escape reality into a make-believe world. For many kids, video games are the next best thing to television and cartoons. In our society children's exposure to technology at a very young age, gives them the ability to understand that technology very quickly. In many cases, it is not uncommon for children to assemble a computer or video game system completely on their own. Because of this, most video game playing children are completely ready for the CD-ROM game era. Most of the elements used in designing CD-ROM games are very similar to video games, such as icons, numbers and text. Animation is a major factor to attract the attention of children to the technology before them.

The age group known as the "Twentysomething" crowd are children from the the Atari era. *Space Invaders*, *Donkey Kong* and *Pac Man* were the video games of choice for us as children back in the late 70s. Kids who were lucky enough to own an Apple IIe, or a TRS80 are many of the people who take an active interest in computer games and interactive media today. At the present time, multimedia kits are more affordable than ever before, and the ease of use of these packages is astonishing. Owning a CPU, a sound card, a controller and a pair of speakers enable a person to experience a high level of interactive game play.

To those who design video games in the industry, a high level of play is critical, due to the increasing rate at which the public, especially kids, demand more and more excitement. It is no longer enough to chase little ghosts around a maze eating up dots as in *Pac Man*. Today, kids want to fly realistic fighter jets into combat situations, or explore the surfaces of alien worlds in a 3-D vehicle created with virtual reality. Designers must keep up with the public expectations, and therefore the forefront of technology must increase accordingly.

"Thirtysomething" is the age group that wasn't raised with these technologies and who are, for the most part, afraid and unfamiliar with them. The rate of action and the pace of many today's game may be slightly too fast for older adults to absorb and learn. The games they play will involve less speed and motion, but more intelligence.

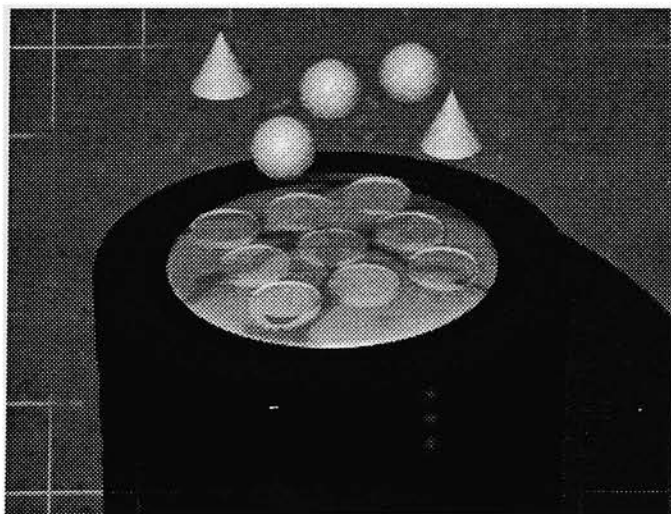


Figure 1G

Live It! takes a similar approach to some other intelligence based games such as *MYST*, in that the user must use logic and reason to solve certain puzzles rather than through violent actions.

Industry Advancements

In the past two years, there were many improvements in CD-ROM technology, double speed drives, better QuickTime play back rates, faster processors, video capture and special effects software packages. These improvements help make CD-ROM production much easier than before. A lot of companies were formed in the past year that have gone into CD-ROM production. Based on the Multimedia Business Report from SIMBA, the entire installed base of multimedia - equipped (CD-ROM and audio) computers and game players had reached a quantity of 6,465,000 by the end of 1993. MPCs tripled to 3 million, and multimedia Macs doubled to 2 million. Video games took in \$5.3 billion last year in the U.S. alone. This represents about \$400 million more than Americans spent going to the movies. Eight million computer CD-ROM titles sold last year - pulling in \$202 million in revenues. Because of these trends and the profits made from them, many small film and multimedia studios are teaming up together to produce CD-ROM games. These new entertainment CD-ROM games will incorporate live action footage along with high quality 3-dimensional environments.

Spaceship Warlock

The very first CD-ROM interactive game was *Spaceship Warlock* which was created in Macromedia Director. Many people in the industry agree that *Spaceship Warlock* helped to define a new set of standards for CD-ROM based games. Drew Huffman said (through a conversation with Mike Saenz on America Online), that "...everyone agrees that Warlock has helped define a new range of products." *Spaceship Warlock* was indeed ground breaking at that time, because it was the first CD-ROM game available on the market. It became a classic. *Warlock* used science fiction elements, traditional "good vs. evil" themes and realistic 3-D environments to depict what its creators called the first "Interactive Movie". However, like a movie, the ending is set and there is only one course through the picture. The story is very simple, and so is the game play. *Spaceship Warlock* was a tremendous first step. However, as we review the way that games have developed, the limitation of "Interactive Movies" are clear.

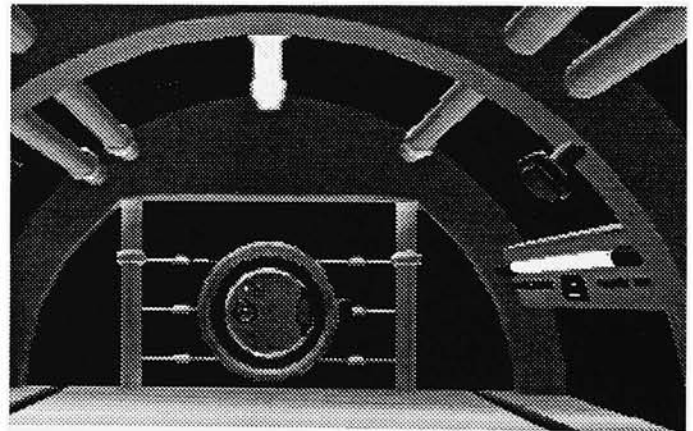


Figure 1H

Spaceship Warlock was the first in a series of CD-ROM "Interactive Movies" to use 3-D environments combined with exotic locations and classic storytelling.

Traditional Approaches to CD-ROM Game Design

After *Space Warlock*, there were many CD-ROM game titles published for the Macintosh, such as *The Journeyman Project*, *Iron Helix*, *MYST*, *Lunicus*, *Better Off Dead*, *Hell Cab*, *Jump Raven*, *Indiana Jones: The Fate of Atlantis*, *The 7th Guest*, *The C.H.A.O.S. Continuum*, etc. All of these CD-ROM titles consists of interactive and game play elements. They all have impressive graphics and sound because of the improvements mentioned earlier. Most of these games lack the most crucial element to good non-linear game design: story telling. Although some companies claim their game is non-linear in nature, after playing for just 20 minutes, it is obvious the game is all too linear. The player always starts out at point A and has to get to point B. In between, you need to obtain certain objects in order to proceed, the structure is very simple. If the game designer wants to extend the game play time, what they usually add are death elements. If the player "dies", she/he has to restart from the beginning or at the last saved position of the game. Another way to lengthen the game play time is to increase the game levels by accelerate the speed of the enemy the audience is against.

MYST

MYST is an interactive game with lots of intellectual plots and puzzles, and it was the bestselling game in the spring of 1994 for both PC and Mac. *MYST* was published in October 1993, which was the time of the research phase of our thesis. We were able to talk to Robyn Miller, one of the co-creators of *MYST*, and had the opportunity to conduct a telephone interview with him. (see page 16)

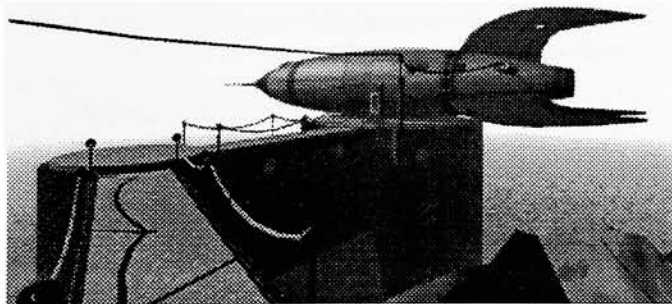


Figure 11

Unlike previous interactive adventures, *MYST* combined thought provoking puzzles with a semi-non-linear game structure.

The interface in *MYST* is very simple; a first person view which allows the user to simply point and click in the direction he/she wants to go. Since the interaction in *MYST* is limited to navigating and touching things, this type of interface works fine. The three-dimensional environment scenes were done in StrataVision 3d, a software package we had just learned in the spring quarter during our first year in the program. We were very excited about how *MYST* was executed, and we could see ourselves doing the same thing. Although the storyline is still, for the most part linear, *MYST* had a very big impact on us, it was playful and intelligent. *MYST* provided a benchmark both on the visual and intellectual level for *Live It!*, and we feel that we were lucky to be involved in this project at the same time *MYST* was released.

Industry Interview

Because of the obvious attention to quality and good story telling that was present in *MYST*, we decided to contact one of the co-creators of *MYST* directly for an interview. The following is a transcription of an interview with Robyn Miller. The interview provided many insights into the area of interactive game design, production and game structure. Mr. Miller's opinions were both refreshing and inspiring to the both of us. The text of the interview is presented here, but some portions have been edited for the purpose of space or clarity.

G=Gedeon **T**=Talos **R**=Robyn

G: Did you develop *MYST* by yourself, or with a team?

R: We developed it (my brother Rand and I) are kinda the guys that started this company, and we did a few other children's projects a while back. I don't know if you're a *Cosmic Osmo* fan or not. When we wanted to do *MYST*, we decided we definitely needed a larger team, we needed more people. So, the five of us, another artist, a sound guy, and another programmer were the team that put it together.

G: And each person was specialized in one or more areas?

R: One or more than one person just because of the amount of people we had, we had to rig a lot of things, and that means that one person may have to do art and music, and another may have to do programming and a little bit of art retouching. So we kinda found people that were multi-faceted, or as multi-faceted as possible, in order to do that.

T: What program did you use? Spaceship Warlock used Macromedia Director, did you write your own program or?

R: No, it was all done in Hypercard. We worked in Hypercard for a long time. We were frustrated with certain aspects of it. But what we were able to do with *MYST*, we were mostly concerned about speed, we knew we couldn't use Director because of the speed, it was just too slow. One product that was not going to slow you down was that (Hypercard). So, using Hypercard, we used some X commands that took away kinda the aspects of Hypercard that we weren't going to use, the black & white buffers, etc. we didn't need those at all. So with these X commands, which we did not write by the way, we were able to display color to the screen really fast just by slapping color directly to the screen rather than going through a bunch of overhead that might be in with a program like Director or another development program.

G: So is the entire game in one file, or does Hypercard go and get individual PICTs to display them?

R: Actually the entire game resides on your hard-disk, but it's the game minus the resources. All the resources reside on another file, or a few files that are on CD-ROM. The reason we decided to put the game on the hard disk is just that we gain a little bit of speed that way.

T: How big (in size) is the whole CD-ROM ?

R: It took up almost all of it, and we had just enough room to put on a movie called "The making of *MYST*", a little QuickTime movie that took up like 50 megabytes or so.

G: Is most of the space on the CD taken up by still images?

R: There is a lot of video, something like 60 minutes. But the still images took up a lot of the room because those weren't compressed.

T: Were most of the 3-D graphics done in Strata StudioPro?

R: Yes. We dabbled a little bit, well actually we know quite a few other programs, but we made a conscious decision to use Strata because the image quality. During the development however, we did use some other programs like Infini-D. For the modeling sometimes we use MacroModel, but 99% of it, including the modeling, is done in Strata.

G: After the game was conceived, did you break down the work load for the production into different phases like brainstorming, storyboarding, that kind of thing?

R: Not so much in an organized way as you might think, although we were more organized with this product than we've ever been with any other product. We started out in a more informal way, with brainstorming and designing. We kinda just sat around for a month and a half, I'm not really sure how long. My brother and I worked on that part and that's when we brought the rest of the team into it, and of course everybody had... we made a lot of changes because of the input of whatever the team...throughout the whole implementation process, which was art, code, sound.

T: From the beginning to the end when the CD-ROM came out, how long was that to finish it?

R: Two years. We thought it was going to take one year. Boy were we surprised.

G: Did you encounter any problems in the software or production that would be helpful for us to know about?

R: Huh, yeah. Our biggest problems were probably speed. When we started out, we didn't have most of the development tools that we needed. Then, we were able to resolve that. Because we started out even before QuickTime was released, so we didn't know *how* we were going to do the video, and we didn't know how we were going to compress the pictures. In fact, if we didn't have QuickTime, all the pictures in the game would not have been able to fit on one CD-ROM. But those were resolved with tools like QuickTime and the X commands that we used to display the pictures. Other problems were rendering times, it took a long time to render some of the images, up to 24 hours for some of them.

G: What kind of equipment were you using, Quadras?

R: When the project started we bought the best possible computers we could and they were Quadras, the 700's and 900's. Which aren't so much the best anymore. With 20 megabytes of RAM we were real excited. But we found out that that was not enough, we were running out of memory when we were rendering, slowing down, so we upgraded to 68 and that seemed to work fairly well for the complexity of the images we were doing. You can do a lot with 20 megabytes and virtual memory. The whole *MYST* island as a matter of fact. That's why it's so simple in the modeling, you may notice that as opposed to some of the other islands. The *MYST* island, modeling wise, the most simplistic because we needed simple geometry because of the lack of memory we had.

G: How did you achieve the kind of organic looking cliff faces on the *MYST* island?

R: We invented a method, I'll say invent, although I'm sure thousands of other people have invented the same method out of necessity. We would paint a grayscale image where white areas would represent high areas on the terrain and black would represent low areas. Then we would just paste that image into Stratavision and Strata would extrude that to the proper height and create a model for us.

G: We are curious to find out your opinion on some of the other interactive games that are out right now.

T: We've played a lot of games and so far we're not really happy with them.

G: I think it is the whole idea that the graphics and the sound is great but the game-play is for the birds.

R: I've seen a lot of them, and I've been pretty impressed. A lot of people have done a nice job. My biggest frustration and

what we wanted to concentrate on when we did *MYST*, was that we really wanted the game play to be good. More than anything, the graphics are really pretty, and the sound is nice, and its fast, but more than anything we really wanted nice tight game play that was interesting and kept the user playing. That's why I always quit those other games. I would play for a while and say "nice pictures" and then I would be bored.

G: That is pretty much how I feel too. It's great visually and its a huge leap as far as games are concerned, but when I was in high school I used to play games where the graphics were really bad, but I could play them over and over.

R: Right. That's what a game is, it's the story. When you go to a movie, they may spend millions and millions of dollars on the *Terminator 2*, but if the story isn't good then nobody likes it and they would rather go see some low budget thing with a good story.

G: Do you have any gaming or strategy background, or did you just come at it from a computer standpoint?

R: No neither of us had background in that area we both played the earlier adventure game and we enjoyed it. But I know I always had the biggest frustration with how you always die in games. In *MYST* you don't die, because it's almost ridiculous, unless you're dead forever, how can you die, and then come back and save the game? It slows you down, it's a stumbling block and I think a lot of people did that because their games weren't big enough and it made the game play longer. And so it's kind of a false way to extend play. We extended play by just making it huge. And far as having experience, we really have not played a lot of computer games, I know we both like to read a lot, we like good books and stories, we like good movies, I don't know, maybe that contributed to our desire to make a good story.

T: What do you see as the future of games or what games will eventually become?

R: I would like to see them become something that become bigger, where the worlds can be larger. I would also like to see them reach the quality of good literature...more in the realm of art, and I don't know if *MYST* can be categorized that way.

T: Thanks for your time, you've been really helpful.

G: Yes, we appreciate your time, goodbye.

The Entertainment Community & Interactivity

Nobody had thought that the name Hollywood would have been associated with interactive media until CD-ROM based games became popular. Movie licensing of action figures and video games are major factors to increase revenue for a motion picture company. Studios are filming movies with extra footage, so that they can be input to video games. Furthermore, computers have been widely in use in the movie industry for special effects for quite some time. The improvements can be seen from movies, such as *Terminator 2* and *Jurassic Park* to *Forrest Gump* and *True Lies*. Some interactive companies, even build their own sets, and hire actors to act out scenes for their interactive games. Games such as *The Horde* and *The Journeyman Project* have advertised the product along with the well known actors and actresses that appear in the game. It is now not uncommon for an actor to seek work not in motion pictures, but playing a part in a CD-ROM based adventure. Another reason for the hype of multimedia is the Clinton administration's attempt to promote the "information super highway", which is a network of computers, data, and interactive television. The goal of multimedia is entertainment, and that what's brought Hollywood and computer industries together.

The new advancements in technology such as MPEG1, MPEG2, and QuickTime 2.0 provide better compression and playback, which will allow full screen digitized video. Higher CD-ROM access speeds will change the face of multimedia within the next few years. In addition, speech recognition and ever increasing artificial intelligence will no doubt affect the way games are played. Advances in virtual reality will make it easier and more cost effective for the entertainment industry to merge with the realm of interactivity to a point we can not yet realize. And finally the introduction of the Power Macintosh will make a significant change in the production of multimedia projects and the increase of competition between hardware and software companies.



Figure 1J

Games such as Interplay's *The Horde*, star big name actors in an attempt to liken the game to a television program or motion picture. Today's technology has allowed much freer range with digitized video which has resulted in this merger of the entertainment and game industries.

The Future of Interactivity

As we have seen, the present state of interactive gaming has come a long way from its origins. Every day there are advancements in concept and technology. The key to good games has always been a balance between interactivity, storytelling and technology. When the opportunity arose for us to take an existing concept (that of an interactive adventure on CD-ROM) and improve upon it, we jumped at the chance. Our understanding of computer graphics, animation, interactivity and image creation - as well as our love for a good story, allowed us to create *Live It!*.

There were many factors that we wanted to build into the game, among them: non-violent, non-gender bias, an intelligent story and a strong lead character. These things, along with the player's ability to change his/her destiny in the game broke away from the traditional approaches we have shown you in this chapter. There are many more precedents to be set, and many more improvements that can be made. By taking these first steps, we hope we were able to add our own small contribution to the history of game development for the computer. *Live It!* stands as any thesis should, as an experiment, a statement about what is possible, and what could become the norm in the years to come.

Game Title - Spaceship Warlock

Publisher - REACTOR Inc.
Chicago, IL

Designer - Mike Saenz

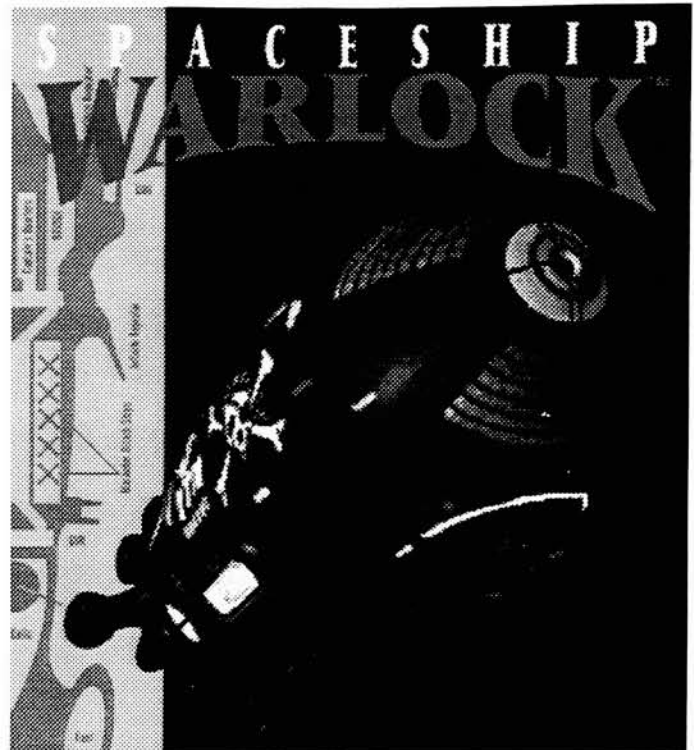
Spaceship Warlock is a classic adventure game in the grand tradition of Science Fiction. You play a sidekick to Captain Hammer -- a space pirate out to plunder the galaxy and win the woman you love. As the plot unfolds, you discover that you must free humanity from the oppressive hand of the Kroll (an alien race that has enslaved the world) by finding the ultimate object (an orb) and using it to destroy the rule of the Kroll.

Talos: Although it was the first major interactive CD-ROM game of its kind, I don't think it deserves the rating it received from the media. The graphics and animation are great, but it is somewhat slow, and the interface for interactivity is not very clear. Because of the interface design, it is sometimes unclear how the player should react from time to time.

Gedeon: *Spaceship Warlock* had a lot going for it when it was first released: fantastic graphics, sound, an epic plot, and a movie-like feel. But like so many movies past, what was once fantastic, is now passe. *Spaceship Warlock's* graphics, though great, react slowly. The plot is epic in nature, but is totally geared toward the male ego. Females are reduced to white-haired bimbos who don't have a useful place in the society of the future.

Talos: I like the music, it is sort of catchy. It is the first CD-ROM to showcase great music with animation and interactivity. After playing *Warlock* for two hours, I quit because I became lost in the game as well as bored. It didn't capture my attention because the game play was not as exciting as I had expected. *Warlock* claims to be an "Interactive Movie" and because of this, it gets away from actual game play. Playing *Warlock* is more like clicking the play button on your VCR remote once in a while, why not just go and rent a movie instead?

Gedeon: *Warlock* plays out so linear that when you've gone through the game once, there is never a need to play it ever again. The story and graphics are not good enough to made you feel the need to re-experience the game.



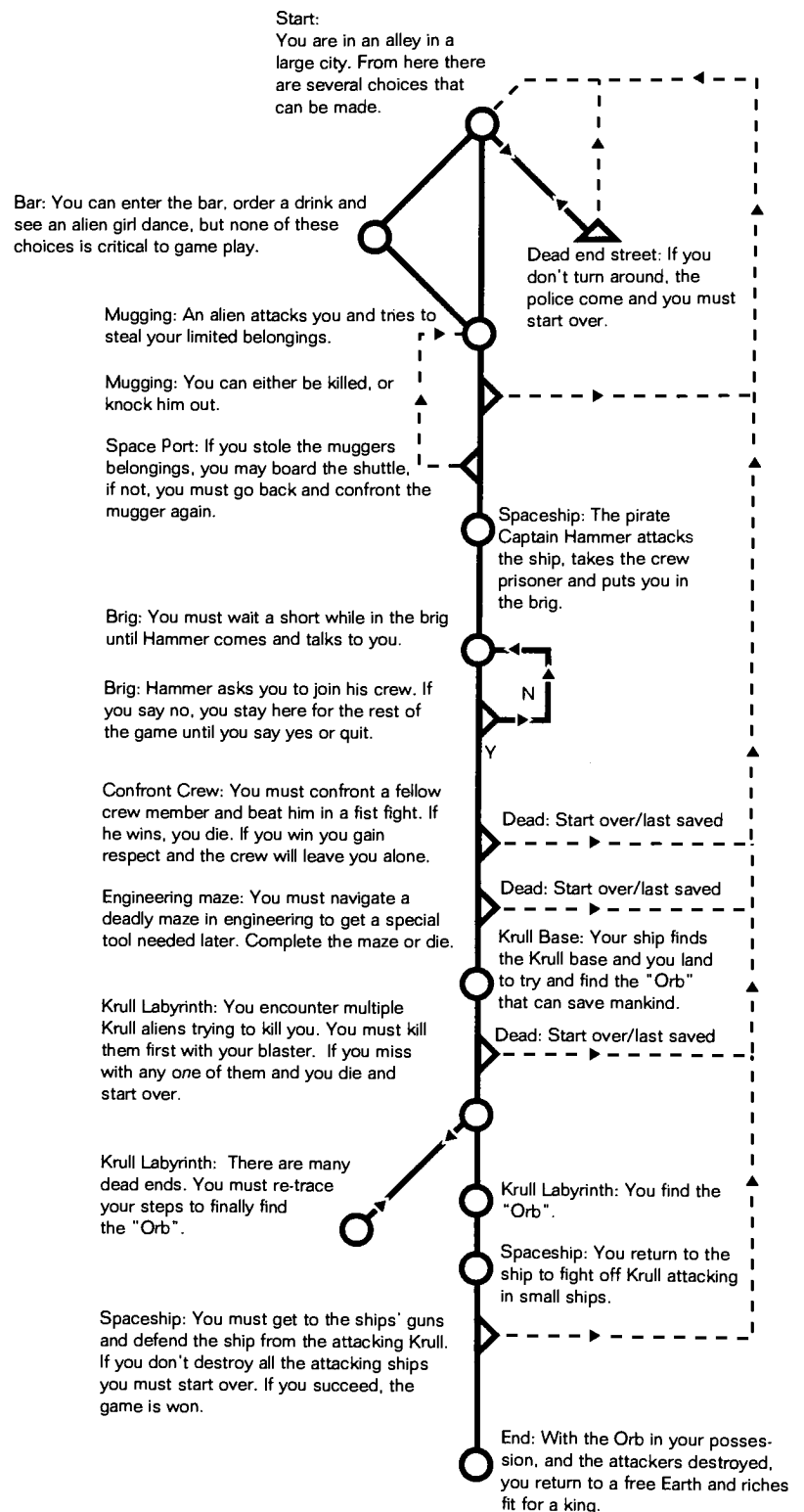
"Robustly detailed and dazzling in its sweep and depth, *Spaceship Warlock* is a blazing, swashbuckling, wonder-filled Science Fiction epic in the grand tradition! Incredible graphics, 3-D animation, and an original music score combine to create a cinematic adventure in which YOU become the central character! *Spaceship Warlock* is an interactive saga that you can experience again and again!"

- REACTOR
Press release

"*Spaceship Warlock* has everything you'd find in a 1950's B-movie--a beautiful damsel in distress, a rogue commander battling a fascist imperium in search of treasure and liberty with evil robotic aliens as adversaries. The overall design of the CD-Rom is brilliant--well conceived and meticulous in its design. It has superb 8-bit color graphics, atmospheric soundtrack, and amazing vivid sequences that compare cinematically with *Star Wars* or *Blade Runner*. As an interactive movie on CD-ROM, it excels..."

- Mark Bennett
MACWORLD U.K.

Diagram of Game Structure for Reactor's *Spaceship Warlock*



Game Title - Hellcab

Publisher - Time Warner Interactive Group
Burbank, CA

Designer - Pepe Moreno

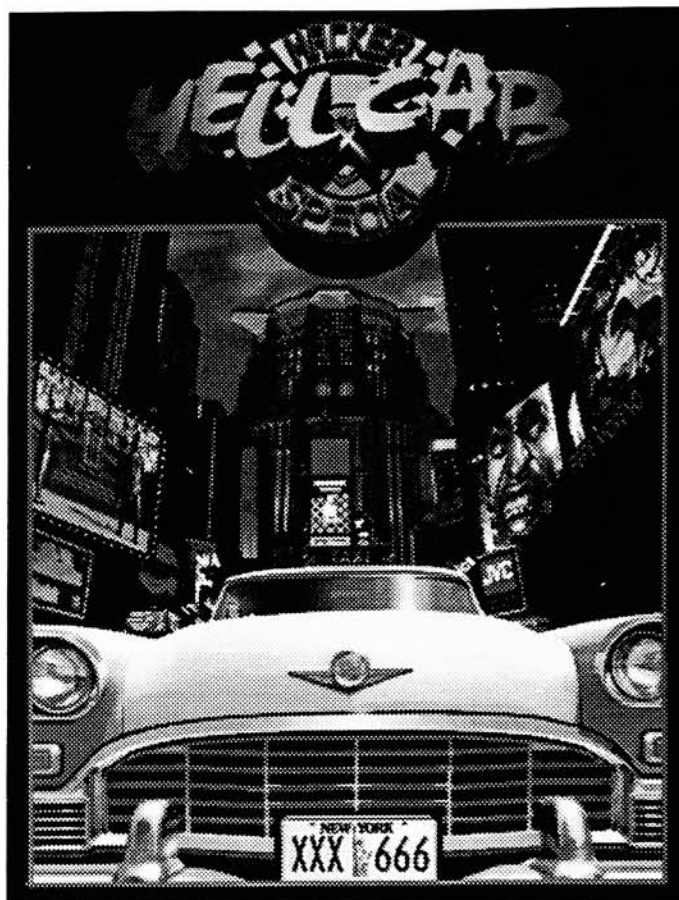
The basic plot of *Hell Cab* focuses around signing a contract with the devil disguised as a cab driver, and you spend the rest of the game trying to survive with your soul intact. Game play extends through three basic levels including Imperial Rome, the trenches of WW I, and the pre-historic age.

Talos: The game starts out very limiting, and continues throughout the entire game. I lost interest after three hours of play time. I lost interest in *Hell Cab* because the action is very linear and redundant. One way *Hell Cab* extends game play time is by killing the player (the audience) and using extra time to bring her/him back to the beginning of the game. I found this annoying.

Gedeon: *Hell Cab* is one of those games that entices the player with fancy graphics, sounds and the promise of a great game experience. However, once one starts to play *Hell Cab*, it becomes quickly obvious that the role of the user is more of a passive one than an interactive one. It seems as if the game goes by at a steady pace no matter what course of action the player takes. I found this to be one of the major downfalls of *Hell Cab*.

Talos: The graphics and color are great, but the game play is nothing close to what the advertisements claim. The game plays slowly on both high end and low end Macintosh's. It is impossible to rate its performance on the PC, but I don't think there will be much difference. The speed of the game play is yet another factor why *Hell Cab* is so boring.

Gedeon: The interface is simple (a pointer finger and your soul-o-meter to keep track of your so-called "lives"), but due to the speed of the game, the interface often gets in the way of exploring and interacting, which reduces the player's interest level dramatically. The chief designer, Pepe Moreno supposedly brings an understanding of the visual arts to *Hell Cab*, and at certain points it is apparent. Most of the time *Hell Cab* just looks like another flashy game for CD-Rom.



"Your travel plans have been interrupted by an unexpected layover in New York City. With some time to kill, why not hop into a cab and take in the sights? What could go wrong? Maybe you didn't see the sinister gleam in the driver's eye... Maybe you didn't notice the 666 on the license plate...Either way, it's too late to turn back. You've just stepped into the wrong cab. The *Hell Cab*. Buckle up. You're in for one hell of a ride!"

- Hell Cab
Instruction Manual

"Internationally acclaimed artist Pepe Moreno is renowned for his innovative visual storytelling and sense of color. Among his numerous works is the best-selling *Batman: Digital Justice*. *Hell Cab* is a true work of art. An explosion of furious beauty and glamour, incorporating the best in state-of-the-art technology: 3-D graphics, sound effects and music."

- Time Warner
Press Release



"...one of the most realistic 3-D games the desktop computer market's ever seen."

- San Francisco Chronicle

"*Iron Helix* is more than just a game--it's sci-fi space opera and film noir at it's best."

- New Media Magazine

"Pac Man meets Alien...*HELIX* is a stunner."

- WIRED Magazine

Game Title - Iron Helix

Publisher - Drew Pictures

Designer - Drew Huffman

The story behind *Iron Helix* is an old one, but a favorite. An evil alien spacecraft is about to destroy Earth unless you can navigate your remote probe onto the alien vessel, and solve the clues left behind by the dead crew. You command a remote control robot that searches the vessel for DNA samples left behind, while trying to avoid the ship's on-board defense systems. There are three levels of difficulty, but only one storyline and two possible endings. Either the world is destroyed, or you are.

Talos: During the Macworld Expo of 1993, Drew Huffman was one of the keynote speakers. One of the audience members stated that *Iron Helix* was rather easy to solve and he seemed disappointed. Drew Huffman responded that he should try a more difficult level. However, I think it doesn't make much sense to play the same game again even if it is a higher level, because you already know where the clues are and how to solve the game. Repeating the game on a higher level simply means it is easier to get killed. The game play is very similar to following orders, you must "do this, do that" to continue, the player doesn't need to think or solve problems much to solve this game. The graphics are good, but the major drawback is the game play. The video clips are nicely placed and the user interface is clear and easy to follow (after you read the manual).

Gedeon: The introduction of *Iron Helix* starts out with a great deal of promise. The music, animation, and story all seem to draw the player into what is about to occur. When you are piloting the probe, the sense of atmosphere and location is quite complete and convincing, and the sense of danger from the defense system seems real. After about 30 minutes however, the defense system seems to become little more than an annoyance. The hunter robot that is tracking you just gets in the way of finding clues, and slows your progress. This is yet another example of how the game designer can build in death sequences to extend out game play. This is to say nothing about the fact that once you play the game once, you know where all the clues are, because the game does not scatter them randomly on the ship. Playing once means never playing again.

Game Title - The Journeyman Project

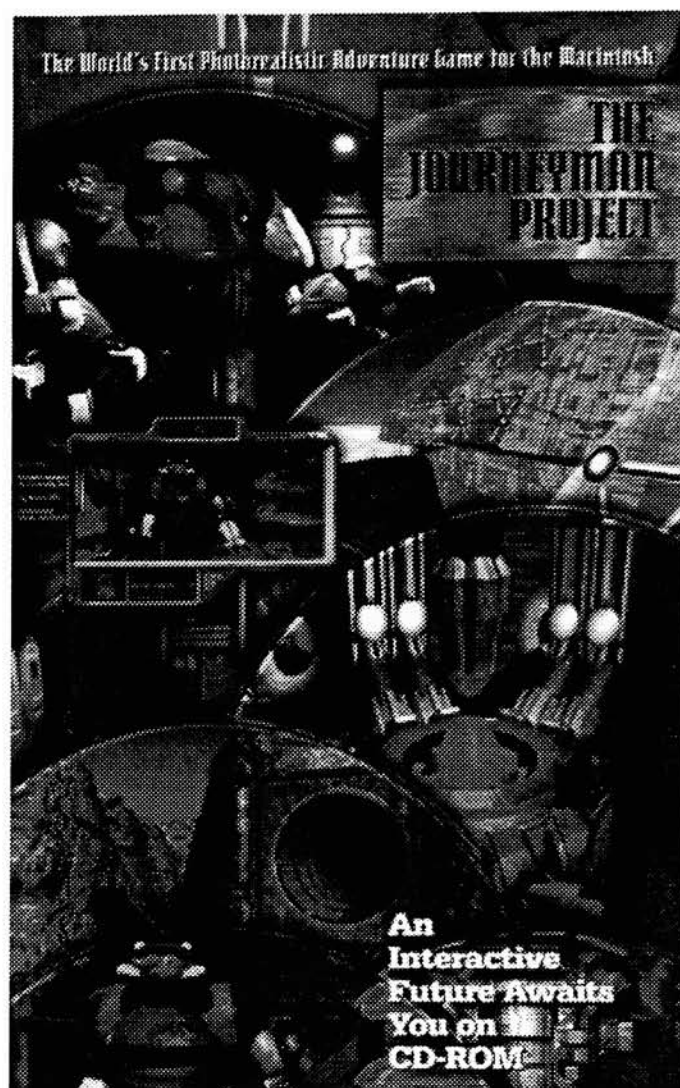
Publisher - Presto Studios

Designer - The Presto Team

The Journeyman Project billed itself as the "First photorealistic adventure game for the Macintosh". *Journeyman's* graphics far surpassed anything that had previously been released and the story dealt with an old favorite...time travel. The story deals with a "mad scientist" that has gone back and messed around with history. It is the job of the player (as one of the Temporal Protectorate) to go back in time and set straight the points in history that have been altered, thereby restoring current time and saving the universe. The game boasts that there are at least three distinct ways to solve every mission back in time. Usually, one is the violent (or wrong) way, and usually one is the peaceful or right way. The game featured a highly detailed interface with many buttons and features, and the environments were rendered completely in 3-D

Gedeon: When I first played *The Journeyman Project*, I was immediately stunned by the visual quality of the game. Every aspect of the design had an obvious feel of professionalism and expertise. I found the game play to be interesting and the story to be the most fleshed out of any game to date. Some of the puzzles were particularly interesting and kept my interest adequately. However, I solved the entire game in one day. Upon its completion, I did not get the satisfaction that I was expecting from such a high quality product. The three or four plot branches were completed rather quickly and I found no desire to go back and play the game a second time once I had solved it. The manual says there are at least three ways to solve each branch, but I had no interest to try and find the other two ways for each branch because I already knew the outcomes. All in all, *Journeyman* was the best game you could buy until *MYST* was released, but I ended up feeling cheated by *Journeyman* because I expected so much more from the game.

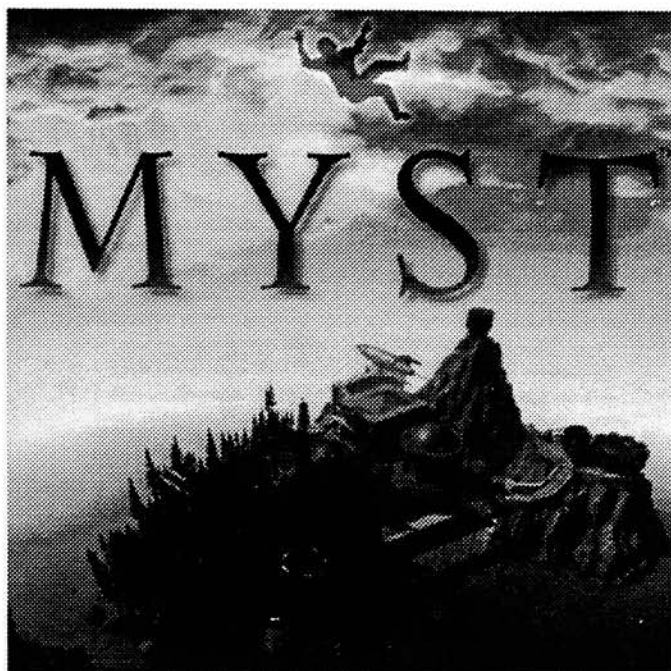
Talos: Although I never had the opportunity to play test *The Journeyman Project*, I like the idea of non-violent solutions.



"A rip has been detected in the fabric of time. Only moments remain until all that mankind has accomplished is laid waste. Your objective -- journey through time...from prehistoric lands to the distant future, to prevent any compromise in the established continuum."

- Journeyman Project
Press release

- Gold-Best Animation Graphic Award
- Bronze-Best Production Design Award
- Bronze-Adult Games Winner
- New Media Envision Multimedia Award 1993
- Mac Computing Editor's Choice 1993



"You have just stumbled upon a most intriguing book, a book titled *MYST*. You have no idea where it came from, who wrote it, or how old it is. Reading through its pages provides you with only a superbly crafted description of an island world. But it's just a book isn't it?"

- *MYST* User Manual
CYAN Inc.

"When we started, we wanted to make a statement, but the project was so big and took so much effort that we didn't have the energy or time to put much into that part of it. *MYST* was so different and so much bigger than anything we had ever done. So finally we decided to just make a neat world, a neat adventure, and say important things another time."

- Robyn Miller
Interview with
CD-ROM Today
Magazine

Game Title - *MYST*

Publisher - Broderbund Software

Designer - Robyn & Rand Miller

There was a great deal of anticipation on our parts right before *MYST* was released. We were intrigued by the early photos we saw of the rendered island, and we heard a great deal about what *MYST* had to offer. None of this, nor our interview with Robyn Miller, prepared us for what we saw when we played *MYST* for the first time. *MYST* takes place on an enchanted island that is far from home. The player is deposited there (for good or bad) and must slowly and intelligently put all the pieces together to discover what has happened. *MYST* Island is just one of several "Ages" that must be explored to complete the game. These Ages can be explored in any order and each one offers a variety of puzzles, experiences, and sights and sounds for five games just like it.

Talos: The first time I saw a review of *MYST*, it was in a small article in New Media Magazine. It wasn't out, but later that month, I happened to be speaking to the 3D artist, Chuck Carter, on America Online. He gave me the phone number of Robyn Miller, and we asked Robyn for an interview. We hadn't yet played the game at the time of the interview. After seven months, *MYST* has become a big hit for PCs. I was impressed by the interview, so when I saw it on the shelf, I bought it right away, the graphics were great, and the game play was excellent. The puzzles amazed me, and I just couldn't stop playing the game until I solved the puzzles.

Gedeon: The single most important element that I believe *MYST* brought to the world of CD-ROM games was the philosophy that the experience of playing and exploring can be just as engaging as trying to win. You spend a great deal of time simply looking around and soaking up the visuals of *MYST*, not just because they are gorgeous to look at, but because every detail may have significance in the end. Overall, *MYST* is the best product for the CD-ROM game player available today.

Talos: In *MYST* you don't die, you explore! The game is not gender biased, and provides adults with a much higher quality game. *MYST* is not like other adult CD-ROM titles that simply sells sex. This is the CD-ROM that sells intelligent story telling! The more and more puzzles you solve, the more information you gather. That's the way the audience is lured into the world of this game, and that's why it was so successful.

Brainstorming the Story

Like any book or movie, a game must start with a story. The story is key to the development of the game because it dictates the locations, characters, interactions, rules, roles and goals of the game. Certain games are based on simple stories that somehow found themselves becoming games. Children's games are a good example of how a story can be told and then a game develops as an extension of that story. Ring Around the Rosie has its origin in the times of the Black Plague back in old England.

Unlike children's games however, most interactive adventures available on CD-ROM today involve complex storylines akin to big budget movies or novels. Granted, most of these game's stories can be broken down to the most simple plots such as "stay alive" or "save the world". Most of these types of games involve a myriad of characters and locations that transport the player over vast distances over the course of the game.

The story structure for *Live It!* had to not only be complex enough to support the many branching points, but it also had to be engaging enough to keep the player interested through these many plots. In order to help achieve this level of interest, we used a similar technique that was developed by early film makers, namely the cliffhanger. Cliffhangers allowed the film maker to present part of a story and save the next installment for next week. In this manner, the movie studios always had people coming back week after week to learn what happened to the hero next. The very structure of *Live It!* allowed for the cliffhanger motif. Part of the story would be experienced with every sitting. After many times of playing the game, the player would build up a total understanding of the events that were happening in that universe, thereby giving the player an extreme sense of satisfaction. This is similar to the way people who watch a particular television series faithfully feel at the end of a season. Because they have watched most if not all the episodes, they understand all the intricate workings and relationships between the characters that someone who has only watched once or twice cannot possibly understand.

With these things in mind, we set out to brainstorm a variety of possible story factors. The lists on the following pages outline all of the various elements that were thought up and brainstormed. From these, the strongest elements were chosen and the final draft of the story for *Live It!* was completed. A summarized final version of all the major branch points follows after the lists.

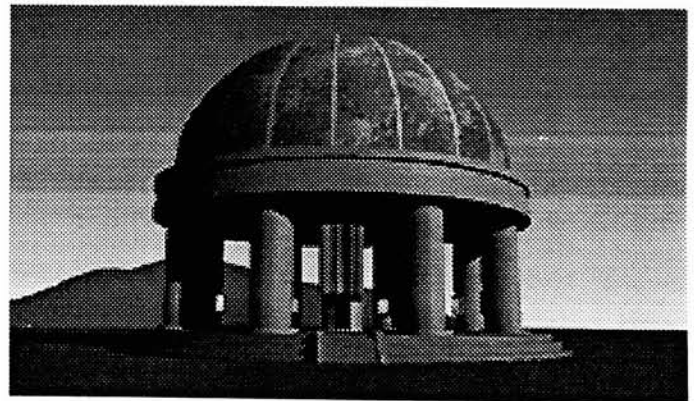


Figure 3A

This early version of Dr. Icona's laboratory was one of the first images rendered in the creation of Live It!. This ancient temple serves as the starting point for a galaxy full of adventure.

The process began by brainstorming individual lists of game elements that would be used in the next phase as well as the occasional creative boost we would need. The lists are broken down into the following categories:

Potential Audiences	The people who would be viewing, playing and evaluating the game.
Human Factors	Physical aspects of the primary character that would provide a creative twist.
Primary Character	The character which the user would assume while playing the game.
Social/Educational Issues	Themes or subjects that might possibly appear during the course of the game that would have a ethical or educational value.
Goals of the Game	What the objective of the game is. What the primary character is trying to accomplish.
Processes	Various ways in which the primary character can hope to achieve the goal of the game. Accomplished through different types of interactions.
Viewing Environments	Possible locations where the game would be viewed/played.
Reasons for Playing	Possible motivations for the audience to play the game.
Sci-Fi Elements	Plot or story devices associated with science fiction.
Description of Full Circle Design	Corporate word list of the imaginary company that would produce the game.

List 1

Potential Audiences

- Male
- Female
- Age
- 15-20 Something
- CD Rom Publishers
- Teachers
- Students
- Parents
- Children
- Apple Corporation
- Software Developers
- Other Game Companies
- Fellow Designers
- Thesis Committee
- Arcade
- Television (interactive)
- Movie Lovers
- D&D Players
- People who enjoy strategy
- History Lovers
- Sci-Fi Lovers
- Animators
- Graphic Designers
- Comic Fans
- Mystery Lovers
- College Students
- Computer Owners
- Older Adults
- People who play traditional video games
- Puzzle Solvers
- User Groups
- Internet Users
- AOL Users
- Multi-cultural
- Physically challenged

List 2

Human Factors

- Blind
- Deaf
- Physically challenged
- Foreign
- Mentally retarded
- Children
- Elderly
- Poor eyesight (not blind)
- Poor hearing
- Dyslexic
- Can't spell
- illiterate
- Wealthy
- Poor
- Short attention span
- Hyperactive
- Extreme intelligence
- Artificial limb
- Can't speak
- Confined to room or bed
- Fear of
 - heights
 - strangers
 - open spaces
 - confined spaces
 - darkness
 - being alone
 - others
 - animals
 - insects
- Allergic
- Computer illiterate
- Biased toward a gender

List 3

Primary Character

- | | | | |
|--------------------------------|-------------------------------|----------------------------|---------------------------|
| - Human pretending to be robot | - An insurance investigator | - A clone | - A supervisor |
| - Scientist | - A burglar | - Father time | - A weather person |
| - Military officer | - A psychologist | - A CIA agent | - A chairperson |
| - Frankenstein | - A social worker | - A writer | - A political analyst |
| - DNA mutation | - A victim | - A submarine commander | - A firefighter |
| - Virus | - An obsessed person | - A water dog | - A campus safety officer |
| - Have amnesia | - Has a split personality | - A lawyer | - A rapist |
| - Super-hero | - Is gay | - A graphic designer | - Jack the Ripper |
| - Every day hero | - Is a lesbian | - An animator | - A Greek hero |
| - Special abilities | - Is religious | - A cartoonist | - A singer |
| - Part human/part machine | - Is God | - A photographer | - A dancer |
| - Genetically enhanced | - A plastic surgeon | - A doctor | - A time traveler |
| - Warrior | - An alcoholic | - The CEO of a major corp. | - A bartender |
| - Spy | - A homeless person | - A TV reporter | - A thief |
| - Gay leader | - A poor person | - A newspaper reporter | - A blind person |
| - An animal | - A student | - A billionaire | - A mute person |
| - An alien | - A cook | - A playboy | - A computer programmer |
| - A politician | - A librarian | - A cop | - An illustrator |
| - A child | - A professor | - A laundry attendant | - A hairdresser |
| - Miniaturized in something | - Death (grim reaper) | - A pilot | - An artist |
| - Someone suffering | - A deaf person | - A waitress/waiter | - A prison guard |
| - An elderly person | - A robot scientist | - A construction worker | - A prison inmate |
| - A brilliant person | - A weapon expert | - A mother | - A warden |
| - A mutant | - Has artificial intelligence | - A father | - A cab driver |
| - Has mystical powers | - D.A.R.Y.L. | - The President | - A Greek god |
| - A professional killer | - A military general | - A pizza delivery boy | - A mailman/woman |
| - A mercenary | - A racer | - A martial artist | - A veteran |
| - A judge | - An athlete | - A boxer | - A sailor |
| - A bounty hunter | - An accountant | - An assassin | - A bus driver |
| - A detective | - A mountain climber | - A dying person | - An operator |
| - A drug lord | - An archeologist | - A lifeguard | - An insect |
| - A pimp | - A district attorney | - A navigator | - A SCUBA diver |
| - A teacher | - A fugitive | - A terrorist | - A garbage man/woman |
| - A wimp | - A car mechanic | - An interpreter | - A comedian |
| - A loser | - A serial killer | - An android | - A dictator |
| - An investigator | - A NAVY seal | - A counselor | - A baby |
| | - A S.W.A.T. member | - An adviser | |

List 3 Continued

- An astronomer
- An architect
- A security guard
- An engineer
- A prostitute
- A weight lifter
- A vampire
- A ghost
- A witch
- A werewolf
- A mummy
- Dr. Jeckyl & Mr. Hyde
- A phantom
- A carpenter
- A gangster
- A radio announcer/DJ
- A mermaid
- A siren
- A cyclops
- A clown
- A lion tamer
- A ringmaster
- A trapeze artist
- A juggler
- A knight
- A king
- A queen
- A prince
- A princess
- An explorer
- A dwarf
- A sorcerer
- A sheriff
- A cowboy
- An outlaw
- A 49'er
- A maniac
- An elevator operator
- An escape artist
- A magician
- A con man
- An idiot
- A jerk
- A gambler
- An evangelist
- A buddah
- A monk
- An exile
- An opportunity seeker
- A bishop
- The Pope
- A salesman
- A makeup artist
- An actor/actress
- A stunt person
- A director
- A producer
- A lumber jack
- A farmer
- A land developer
- A mathematician
- A biologist
- A model
- A bitch
- A bastard
- A spoiled brat
- A fortune teller
- A gypsy
- A fairy
- A hippy
- A yuppie
- A pregnant woman
- A food taster
- A chemist
- A pharmacist
- A bio-medical engineer
- A fraternity/sorority member
- A Klu Klux Klan member
- A punk
- A vigilante
- A butler
- A wife
- A husband
- An only child
- A cross-dresser
- A celebrity
- A geographer
- A game show host
- A guardian angel
- A bodyguard
- A headhunter
- A cannibal
- A dog catcher
- An opera singer
- A musketeer
- A political leader
- A sewage worker
- A housekeeper
- A cartographer
- Bigfoot
- Invisible man
- A caveman
- An ancient Egyptian
- Elvis Presley
- Marlyin Monroe
- Amelia Airheart
- Jimmy Hoffa
- A dentist
- A nurse
- A valet
- A gang member
- A landlord
- A nosy neighbor
- A philosopher
- A zombie
- A diplomat
- The surgeon general
- A suicidal person
- A vetenarian
- A hobo
- A truck driver
- A conductor
- A plumber
- A baker
- A space probe
- An immortal
- A lover

List 4
Educational Issues

- Table Manners
- Cultural Differences
- Gender Differences
- Sexual Issues (Condoms)
- Geography
- Sciences
- Political Issues
- Environment
- Nature/Animals
- History/Ancient, Modern
- Art
- Philosophy
- Literature
- Shakespeare
- Mathematics
- Drama
- Music
- Courtship
- Hygiene/Health
- Accounting
- Economics
- Travel
- Reading
- Dancing
- Writing
- Friendship
- Relationships
- Foreign Languages
- Law and Order
- Justice
- Right and Wrong
- Ethics
- Role Model
- Exercise
- Observation
- Spelling
- Community Service
- Fire Safety
- Safety for Kids
- Drugs/Alcohol
- Personal Safety
- Multi-cultural
- Multi-gender
- Religion
- Race
- Social Issues
- Homeless
- Poverty
- Crime
- Disease
- Sexual orientation
- Language
- Politics
- Age
- Minorities
- Handicap
- Gun control
- Abortion
- Drugs
- Violence
- Starvation
- Abuse
- Sexual
- Physical
- Child
- Marriage
- Genetic engineering
- Artificial life
- Cybernetics organism
- Computer crime
- Animal rights
- Freedom of speech
- Infidelity
- Trade

List 5
Goals of the Game

- Reproduction of copyrighted material
- AIDS
- Virtual reality
- Cyber sex
- Over population
- Nuclear war
- Pollution
- air
- water
- noise
- chemical
- environmental
- Green house effect
- Ozone layer
- Deforestation
- War
- Terrorism
- Suicide
- Genocide
- Cloning
- Become human/robot
- Rescue someone
- Find out your identity
- Save the universe
- Save the earth
- Find the creator
- Go home
- Heal others
- Quest for knowledge
- Be the winner
- Be the most powerful person in the galaxy
- Find out about the opposite sex
- Get rich/famous
- Detective (mystery)
- Survive
- Revenge
- Change history
- Protect the innocent
- Uphold the law

List 6

Processes

- Talking to a person
 - machines
 - stranger
 - aliens
 - animals
 - yourself
 - God
- Picking up something
- Travel somewhere
- Experience During Travel
 - other planets
 - other cities
 - other times
 - other countries
 - other dimensions
 - underground
 - under the sea
 - on a mountain
- Observe something
 - conversation
 - accident
 - event (news)
 - behavior
 - reading
 - changes
 - violence
 - sounds
 - moods
 - interactive
 - clues
 - colors
 - hints
- Gestalt Principles
- Visual Cues
- Decision Making

List 7

Viewing Environments

- Personal computer
- In your home
- In schools
- Office
- For display
- Any store
- Mall
- Trade Show
- Exhibitions
- TV's
- Laptop computers
- Outdoors
- Movies

List 8

Reasons for Playing

- Fun
- Animation
- Story
- Original
- Heard about
- Challenging
- Intellectual
- Good plot
- Educational
- Gift
- Show off
- Macintosh user
- Can play multiple times
- Problem solving
- Mystery
- Reviews
- Non-gender biased
- Detailed
- Interactive
- Compare to others
- Performance of computer
- Free software
- Sound
- Graphics
- CD-Rom
- Packaging
- Word of mouth
- Men & women
- Well produced, designed
- Movie-like
- Had the money

List 9

Sci-Fi Elements

- Time travel
- Nuclear war
- Space travel
- Robots
- Android
- Lasers
- Light speed
- Stars
- Planets
- Aliens
- Black Holes
- Worm holes
- Heroes, villains
- Anti-gravity
- ESP
- Teleportation
- Hologram
- The force
- Liquid metal
- Treasure
- Shape-shifters
- Force fields
- Shields
- Asteroids
- Meteors
- Solar Flares
- Mars
- Mutants
- Humans on other worlds
- Technology
- Space suits
- Shortage of resources
- Mind control
- Brain washing
- Secret weapons
- Weird creatures
- Armies
- Monsters
- Dictators
- Atlantis
- Probes
- Stranded alone
- Air-locks
- Journey
- The moon
- Moonbase
- Explore
- Psycho-robot
- Crazy computers
- Space vampires
- Warriors
- War
- Independency
- Virus
- Archeology
- Fugitive
- Criminals
- Destruction
- Center of the Earth
- Super-nova
- Comets
- Mission
- Crash-land
- Invasion
- Cannibalism
- Tour of the Stars
- Communication w/Aliens
- Danger

List 10

Descriptions of

"Full Circle Design"

- Young
- Fresh
- Bright
- Active
- Order
- New
- Challenging
- Non-linear
- Structured
- Stable
- Hi-tech
- Modern
- Fun
- Round
- Completion
- Fulfill
- Satisfying
- Sci-Fi
- Futuristic
- Slick
- Smooth
- Good
- Clever
- Non-biased
- Designed
- Balanced
- Competitive
- Affordable
- Original
- Real-life
- Dynamic
- Exciting
- Amazing
- Friendly
- Easy to use
- Intuitive
- Honest
- Straight forward
- Organized
- Visual
- Lasting
- CD Rom

Rough Plot Development

After the individual lists were brainstormed, the list members were written on index cards and placed in piles according to each subject. A random card was then drawn from each pile to form a sublist from which to develop short "plot summaries". These plot summaries were then used as the springboard to generate the final game structure, taking bits and pieces from each summary.

In the lists below, the left column contains a short description of the items that were pulled from the random piles, organized into two sections: "Real life" and "In the game". "Real Life" is a combination of the audience and human factor piles. "In the game" represents a combination of a main character card, a social/educational issues card and a goal of the game card. The items that are italicized are the actual words, events, concepts, etc. that were written on the cards. The short paragraphs on the left are spontaneous responses to the random list members that were drawn.

The plot summaries are as follows:

Real Life:

You are a *lover of science fiction* who is *allergic* to something.

In the game:

You play a *diplomat* on a *quest for knowledge* who encounters *artificial life*.

You are a diplomat on a mission to contact a new race. During your mission you discover that the race is actually a group of artificial beings that were designed as slaves to serve a group of aliens that are now dead. But you discover from some ruins that a small group of surviving aliens left before the destruction of their race. In the process of studying the slave race, you fall in love with one of its inhabitants. Meanwhile, the slave race is at war with another race which were also created by the same aliens, you have to use your diplomatic skills to find peace for both races. Do you chose to find peace? Or do you decide to leave him/her behind and pursue knowledge that could answer the origins of the human race? Do you stay and become a slave to his/her society?

Real Life:

You are a *teacher* with a *short attention span*.

In the game:

You play a *juggler* who *upholds the laws* of correct grammar and *language usage*.

By day you are a juggler, by night your are the Grammar-nator, upholding the laws of correct writing and speaking. You must find and hunt down people who abuse the English language. Each night you have to correct ten people in order to go to sleep and have REM. A cult of fanatical slang user call the Gun Slangers, go around and spread evil slang, and part of your mission is to clean the graffiti on the walls in the city and round up all the cult bosses at each level by solving grammar puzzles such as identifying the subject of sentences, verbs, the predicates, etc. Should you use the dictionary to help win the game? Is your knowledge of grammar good enough? Do you think you can save the city without exposing your real identity as the world's best juggler?

Real Life:

You are a *poor female*.

In the game:

You are a *King/Queen* who must *save your universe* and deal with *religious issues*.

You are a lonely King/Queen who rules his/her kingdom with an iron fist. Because of the way you have treated your subjects, the people revolt and exile you. You have to set out to learn fairness, unless you can solve the internal problems within a given time. You hear about a wiseman (in reality she is a woman in disguise) in a far away land. If you decided to set out to search for the wiseman, there will be a vast number of dark warriors who attack the kingdom, the only way to save your kingdom is to learn everything from the wiseman and fall in love the a woman/man. Can you defeat an army through peace, knowledge and love? Will you have to resort to violence to save your universe?

Real Life:

You are a *blind* person who enjoys solving puzzles.

In the game:

You are a *cook* who is trying to *find the creator*. Along the way you must deal with *gun control*.

You are quantum scientist who enjoys cooking in his/her spare time. One day, after discovering time travel, you start cooking to relax, and you can't help but wonder who invented the wok, so you decide to set out to the ancient orient to have a conversation with him/her. At the same moment you step into the time chamber, a burglar holding a gun enters your mansion, and kills your loved one just before you disappear. The only way to save your loved one is to stop gun powder from being invented. As it turns out, the inventor of the wok has the information about the creation of gun powder that you will need. A number of puzzles through the journey will test your intelligence. Should you change the course of history by altering it? Should you help people by using your scientific skills, which will affect the future? Because the target audience is blind, the game would be controlled by a series of voice commands or braille keyboard strokes. Each scene would be described in an audio format as well as graphically.

Real Life:

You are *15-20 year old* person who is *sexist* toward a gender.

In the game:

You are a *prison guard* who has to *save the earth* and deal with *community service*.

As a prison guard, it is your duty to guard the world's most dangerous criminal. As you lead a group of criminals on their daily round of community service, you learn that the group of criminals you are guarding are not the actual criminals, but rather a group of impostors posing as them. As it turns out, the real criminals, led by the one you were personally responsible for, are planning to destroy the world from their hidden lair under the prison. After returning from the fields you find all the guards dead except for one, a woman who teams up with you to help stop the disaster. You must work together to solve the puzzles and booby traps that arise on your journey into the underground lair. Do you listen to the advice of a member of the opposite sex? Can you stop the criminals and save the earth? Will the criminals ever really do community service?

Real Life:

You enjoy playing *arcade* games.

In the game:

You are a *robot* out for *revenge* who must deal with *computer theft* and the *art* world.

A game with arcade-like action that focuses on you as a robot. One of the robot's abilities might be to recognize and identify famous works of classical art. You are employed or used by the curator of a famous art museum to break into banks and insurance companies to obtain money so that your museum can purchase works of art. The arcade action of the game would come from breaking into high security facilities such as the banks and insurance companies.

Real Life:

You enjoy *role playing* games.

In the game:

You are a *detective* who must *rescue someone* and solve problems relating to *artificial life* and *community service*.

A role playing based game with you as a detective. Maybe someone comes to you asking you to search and rescue a group of individuals which consists of not only humans, but artificial life forms as well. Perhaps the way you spot them is to partake in community service so that you can easily spot them. The game ends when you round-up all of the group members. Do you decide not to rescue them because they are not actually people? Does artificial life merit the same treatment as humans?

Real Life:

You are a collector of comics.

In the game:

You are a fugitive out to discover your identity dealing w/ suicide and law and order.

The game starts as you stand on the top of a tall building ready to commit suicide, but you don't know why. You spot many individuals ready to grab you and take you into custody so you run. As you are running, you realize that you don't know who you are. Maybe over the course of the game you discover that your identity is actually that of a super-powered mutant or hero with abilities that are not of this earth. You also discover the concepts of law and order and justice along the way.

Real Life:

You are an avid fan of *Science Fiction*.

In the game:

You are a secret *spy* who must *save the universe* from war through *observations*.

You are a member of one of two warring planets and your government sends you in secret as a spy to observe and discover the possibility of a super-weapon being created by the other side. The goal of the game is to not only stop the war, but save the universe and ensure peace in the galaxy. What covert methods will you have to use to gain your objective? What problems will you encounter? Can the war be stopped altogether? Will you become the savior of both warring parties?

Real Life:

You are a person who *enjoys solving complex puzzles*.

In the game:

You are a *homeless* woman who experiences the bitterness of sexism, *ageism* and *gender differences*. While trying to *save the earth*.

As a female, you experience unfair treatment in your society because of your gender. Through many experiences both personal and work related you eventually lose everything and you join the thousand upon thousands of this planet's homeless population. While in this situation you must undergo a series of puzzles or riddles due to some supernatural force that will allow you to correct this injustice in both your society and on the planet - thus saving the population from continued chaos and destruction.

Real Life:

You are a *student*.

In the game:

You are a *bounty hunter* in search of the creator of a device. You must be a *role model* and learn about *minorities*.

As a bounty hunter, you have been hired to find the creator of a device called the Linguistic translator. This device enables the user to speak and understand any spoken language, and it imperative that the creator and the plans are recovered so that they don't fall into the wrong hands to be used to turn people against each other. The creator is known to be located in a city populated by every race, culture, alien, gender from every corner of the galaxy and you must study and respect these various customs to serve as a proper law abiding role model. Along the journey, you will encounter many alien and confusing situations that you will have to learn how to deal with and react to in order to survive.

Real Life:

You are a *male*.

In the game:

You are a female lab assistant who is *miniaturized*. On the way *home*, you will learn about *personal safety* and the *physically challenged*.

While working as a beautiful female research assistant in a government lab, your mission is to be miniaturized down beyond the sub-atomic level to study how atoms and particles behave. Once there, you discover that things are not what they seem, and a strange universe of mutant-like creatures rule the dimension. Due to the nature of the environment, all the beings are disfigured and have created a different way of doing things to suit their physical abilities. The society is full of danger and violence lurks at every turn. However, you have been trained in self defense and are quite able to take care of yourself. Your goal is to study, record, learn, survive and return home with the true nature of the universe.

Real Life:

You are an older female.

In the game:

You are an aging female doctor who strives for gun control and justice as you heal others.

You are an aging female doctor and your loved-one was killed in a drive-by shooting while the two of you were on the way to celebrate your anniversary. Ever since that day you have tried tirelessly to help stop the spread of weapons in this country. The game would focus around your journey to track down and stop those who would exploit others for the sake of money or violence. Along the way your knowledge of medicine would let you heal individuals that were injured along the way. Should you save this person or not? Should you fire a gun to save your own life or not?

Real Life:

You are an *older adult* (say 40-60 years of age).

In the game:

You are a *hired killer* on a quest for knowledge. You will encounter topics such as *ethics* and *drugs*.

You're an aging retired killer who used to kill dozens of people without thinking twice for money. Over the years you have learned that there is more to life than simply killing and you are in the process of building a new life when something happens. A branch of the government convinces you that a new drug lord has come into power and is responsible for the addiction and deaths of hundreds of youths and teens and he must be stopped. The "drug" is a new form of VR that is not only addictive but can cause brain damage over prolonged exposure. Since retiring, your identity has been kept a secret so you can eliminate this VR Drug Lord without fear of punishment. If you decide to take the direct approach, you eventually discover that the VR Drug Lord is actually your grandson who moved away from his parents many years ago after he left MIT (after studying Bio-chemistry and Virtual Reality) because his parents got divorced. Your job is to decide how to deal with the problems and perhaps educate him on the subject of addictions and ethics related to drugs and virtual reality.

Real Life:

You are a *CD-Rom publisher* who enjoys playing CD Rom games.

In the game:

You are a *warrior* out to change history who must deal with *Multi-gender* and *cultural* challenges.

You are a time traveling warrior out to destroy earth's history. You are being pursued by a federation of time guardians that are out to stop you at all costs. In your attempts to destroy the past, you encounter many different cultures and races. Part of your equipment is an interface that allows you to tap information (in the form of multi-media) about the locations and time periods you visit. This information provides you with a means of carrying out your evil plans. Another part of your equipment is a mesmer-projector that fools people into seeing you as either a man or a woman, depending upon the situation at the time. Can you obliterate the past? Can you avoid capture? Can you blend in to native cultures and times?

Real Life:

You are a *child* who likes to play computer games.

In the game:

You are a *robot child* who longs to be human. Along the way you will learn about *sexual* and *racial* issues.

You are an alien child without gender. You are neither a boy nor a girl, you're neuter and your "parents" have sent you to a world so that you can decide for yourself which gender and race you would eventually like to grow into. Through your interactions and relationships that you build, you start to understand the differences between the sexes, races and cultures of that world to a point where you can be what you want to be.

Real Life:

You are a teacher.

In the game:

You are a scientist on a quest to become the most knowledgeable person in the galaxy. Learn about drama, and social issues such as the homeless, poverty, and disease.

You are a world famous scientist that travels the universe over in search of knowledge in the quest to become the most powerful being in the galaxy. Through your travels you meet all kinds of people and cultures, experience many world's art, music, drama, politics, etc. You also learn of the negative side of the society as well. You may even want to stop on your journey and try and help solve some of the nagging problems of poverty, starvation, disease, and crime on some of these alien worlds. Your search leads you from one corner of the cosmos, to the other until your experiences reach the limit of your imagination.

Real Life:

You are a comic fan from a foreign country.

In the game:

You are an emotionally suffering teenager who finds out about the opposite sex while dealing with violence.

When you were 6 years old your family experienced the L.A. riots and your home was burned to the ground. In the process, your entire family was killed and you have to live with your abusive uncle. Since then you have been withdrawn into the fantasy world of comics until you meet a girl in your riot torn neighborhood. If you can get a date, will you survive the violence of the neighborhood? Can you come out of your fantasy world of comics? Will you discover love? Is there an escape from the world you have been thrust into?

Real Life:

You are a *physically challenged* person who enjoys *role playing*.

In the game:

You are a *frankenstein* pieced together from parts of dead soldiers. You must prevent *nuclear war* while becoming *rich and famous*.

A small group of terrorists seize control of a top secret government facility and threaten nuclear destruction that would trigger World War IV. The only hope of possibly stopping them is to activate a prototype cybernetics puppet code name: "Frankenstein". He is a combination of parts from top notch dead soldiers. The government was working on him when the terrorists attacked. After you launch him by remote control it is your duty to navigate through the security systems and deal with the terrorists. Can you control this powerful prototype? Can you prevent nuclear war and become rich and famous? Should you rob the government of secret funds located under the base? Should you control the actions of another person?

Real Life:

You are a *deaf* student who enjoys playing *arcade style* games.

In the game:

You are a *military officer* who protects *innocent animals*.

The year is 2079 and most animals have become extinct. The governments of the world have decided to strictly protect what remaining animals there are. The APPASA or Animal Protection Plan and Surveillance Agency is in charge with using deadly force to enforce the laws of the government regarding animal rights. In an arcade style game with fast paced action, you must hunt down and kill those who would destroy the world's animals. You are authorized to kill if needed, or if your own life is threatened. Should you kill people to save animals? Do you shoot someone wearing a fur coat? What if you spot someone eating a hamburger? Will everyone become a vegetarian?

Real Life:

You are a *male*.

In the game:

You are a *super-hero* trying to find your identity. One issue that arises is *genocide*.

You discover that you have the ability to make things happen through the power of your mind. Through experimentation, you discover that there is no real limit on what your powers can do or cause. It has one negative side effect however, if you become angry or excited you sometimes lose control and people die by accident. You must discover the origins of your abilities and where you came from that you can do these things. Will you be able to control your awesome powers? Can you stop people from dying needless deaths because you lost your temper? Is the power worth endangering people's lives? Will you eventually destroy the entire race?

Real Life:

You are an *older adult* who is *computer illiterate*.

In the Game:

You are a computer byte that believes in a "*religious*" sect of the "user" as God. You must *go home* (the CPU) to win the game.

You and an entire civilization live inside a computer at the molecular level. The citizens of this world exist as computer bits and bytes. Lately there has been an outbreak of computer viruses released by a fanatical byte cult known as the Infectants. They are out to bring your world to a stand still and you must stop them by getting to the CPU (home) first. You must navigate this world, (all the time learning about computers) and solving puzzles that bring you one step closer the CPU and home. The cult is out to stop you however, and they will do everything short of shutting down the power to stop you. Can you solve the puzzles in time? Will your lack of computer knowledge slow your progress? Once to the CPU can you clear the virus from the system before it infects the entire mainframe?

Real Life:

You publish *CD-Rom* games and you have an *artificial limb*.

In the Game:

You are a *plastic surgeon* who *heals others* and confronts *overpopulation*.

Long before life evolved on Earth, a race of people lived on what is now called Saturn. The civilization there developed into two distinct levels; those above the clouds and those below. The city dwellers above had all the comforts of life and relished in taking pleasure in life. They thought the same was true of those who lived many miles below them on the surface, but in reality the surface had become lawless and overpopulated to the point that starvation and disease had ruled there for many years. You are a plastic surgeon making a successful way perfecting people's features when your transport breaks down on the way to a distant cloud city. You are forced to crash land and you discover a world filled with injustice, death, birth and hunger. At first you believe that this is only an isolated location, but eventually you realize that the entire surface is in this state. Faced with this moral dilemma, do you return to the clouds and forget about the world below? Do you stay and try to use your medical knowledge to heal those around you? You might meet a resistance leader who plans to travel above and overthrow the corrupt government to make Saturn united both above and below. This act will forever change your world and steal your comfort do you help him/her? Do you try to thwart the plan? Or do you simply return to the clouds and block out the horrors of the surface?

Real Life:

You are a young *child*.

In the Game:

You play a *politician* who must stop *computer crimes* and *change history*.

As the President of the United States, you get to help make America a better place. Through an interface similar to Broderbund's Living Book Series, the child would get to click on many different objects and people to listen to sounds and see pictures associated with those objects. The style would be very cartoony and fun to interact with. For example, as the President you would get to sign bills that would help the nation. Kids could help stamp out theft of software and copying games, etc. By doing a series of so-called "fun but educational activities" as the President, the kid would get to change history for the better. Can you help make the country a better place for kids to live? Is it important to obey the law? What should you do if you know someone who is playing copied games?

Real Life:

You are a *student* with *poor eyesight*.

In the Game:

You are an *alien* who wants to *become the most powerful person in the galaxy*. Deal w/*gender diff*.

In your pursuit to become the most powerful being in the galaxy, you conduct tests on various races in the cosmos. One planet in particular, the earth has been giving you a lot of trouble. It seems there are two major forms of dominate life on the planet - male and female. To aid you in your research, you abduct specimens from both sexes for study aboard your ship. During one of your studies, two of the humans break free and are loose on your ship. You must stop them before they possibly damage the ship or warn earth. Can you recapture them and subdue them before they do permanent damage? Can you return them to earth without being discovered? Can you de-code the information you gathered in order to enslave the earth?

Real Life:

You are a person who likes solving puzzles who has a *phobia*.

In the Game:

You are an animal who must rescue someone and deal with cultural differences.

After years of chasing each other, the coyote is captured by humans during trapping season. Realizing his "friend" and buddy is captured, the roadrunner sets out to rescue his companion from man. Along the way, you (as the roadrunner) must solve various visual puzzles in order to free him. But be careful or you'll end up roadrunner stew. You might employ the help of Acme to help free the coyote. Can you save him in time? Will the two of you be able to return to your life of the chase? Can Acme really help free your friend, and where will you get the money to pay them back?

The following is a list of hardware and software used to create the thesis project. All work was done on the Macintosh platform at the Rochester Institute of Technology and at our home.

Hardware

Computers: Ilvx , Quadra 800, Quadra 950, Quadra 660 AV

Apple 13" and 16" color monitors

DayStar Turbo 040Mhz Accelerator

Scanner: MicroTek ScanMaker II

SyQuest Removable Drive and Fujistu Optical Drive

Apple CD-ROM drive (both internal and external)

Apple Laserwriter Select 310

Hewlett Packard LaserJet IIp

Global Village Mercury Teleport Modem

MediaVision ProAudioSpectrum 16 sound board

SuperMac Video Spigot

Sony CCD-TR65 Hi 8 Camcorder

Cannon Laser Copier

Kodak Color Ease Proofing System

Wacom Artz Tablet

Software

Macromedia Director	Authoring software
Macromedia Player	To create stand alone projectors
Strata StudioPro	Three dimensional image rendering
Adobe Photoshop	Image touchup and manipulation
Adobe Premiere	Edit QuickTime movies and special effects
Adobe Illustrator	Create simple line art for 3D modeling
Altsys Freehand	Create simple line art for 3D modeling and Map of the game <i>Live It!</i>
Fontstudio	Create a typeface used in the game
Audioshop	Manipulate sound
SoundEdit Pro	Edit and manipulate sound
Kai's Power Tools	Create new textures for 3D modeling
Paint Alchemy	Manipulate images and new textures
QuarkXpress	Thesis report and memos
VideoFusion	Video digitized
JPEG Viewer	To run the slide show presentation
ResEdit	Import cursors into Director movies
America Online	Research on game companies and industry connections

The following is a detailed timeline of the dates of processes and events during the thirty week period of the thesis project.

September 1993

- 24th - Submit Thesis proposal
- 28th - Brainstorming story ideas & story variations

October 1993

- 1st - Sent memo to committee members
- 6th - Completed brainstorming lists
- 7th - Met with Deborah
 - Met with Jim
 - Started research on history of games and gaming
- 8th - Contacted Drew Pictures, Reactor, and Presto Studios for game related info
- 16th - Logo for Full Circle Design completed
 - CYAN releases *MYST*
- 18th - Further modification of brainstorming lists
- 19th - Met with Deborah to discuss list revisions
- 24th - Phone interview with Robyn Miller (co-creator of *MYST*)
- 24th - Met with Chuck Plummer to discuss game design and game strategies

November 1993

- 4th - Met with Deborah to discuss progress
- 7th - Animation for Full Circle Design completed
- 15th - Begin writing the first draft of the story's plots, locations and characters
- 30th - Met with David Abbott to refine ideas

December 1993

- 1st - Begin constructing structure map
- 6th - First draft of *Live It!* map completed
- 13th - Revision of map before full committee meeting
- 14th - First full committee meeting

February 1994

- 3rd - Began construction of upper level of Dr. Icona's laboratory in 3-D
- 5th - E-mail interview with Robyn Miller
- 9th - Began testing global variables between movies
- 13th - Began construction of lower level of temple
- 25th - Began construction of Odysis mining station
 - Log.I.C. robot was designed and built

March 1994

- 15th - Video footage was filmed for Quicktime movies
- 16th - Video was digitized and edited for QuickTime movies
- 18th - Recording of original music
- 22th - Called Washington D.C. for copyright materials
- Made lapel buttons for thesis show
- 27th - Several errors in story and plot were corrected
- Character design, set design and story boarding continues
- 28th - Lower temple level completed and intro animation began

April 1994

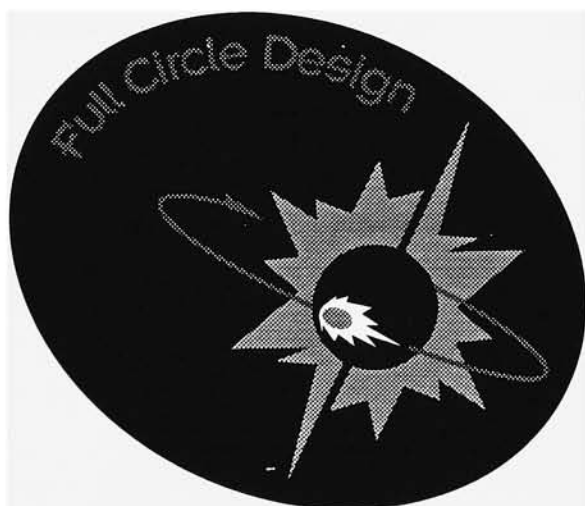
- 2nd - Re-designed and executed the game map
- 5th - Construction began on Hadese Region
- 14th - Game map was printed for Thesis show
- 16th - All images were printed from ETC for Thesis Show (dye sublimation)
- 19th - Full Circle Design logo cut from plexiglass for thesis show
- 21st - Beta test with students from Deborah and Nancy's class
- Revision of elements after initial beta testing
- 22nd - Secondary beta testing
- Further revision of elements
- 24th - Set up thesis display in Bevier Gallery
- 24th - Navigational map added to interface to increase clarity for players
- 27th - Final testing of *Live It!*, last minute scripting corrections, tying up loose ends, etc.
- Constructed self running slide show of PICTS from *Live It!* for thesis show
- 29th - Thesis show

Corporate Statement

Like many individuals starting on a project, we wanted to have a goal or a statement of purpose. We therefore chose to begin by creating an identity for ourselves and the "company" that would create *Live It!*. We came up with an initial list of action words to describe what we wanted to represent, and what qualities we wanted to give to the game.

The name of the company, Full Circle Design, came from the idea that in life, all things come full circle. We set about to create a game that mimicked the choices you made in life, so the comparison to life seemed appropriate. The primary genre of the game is science fiction, so we also wanted this reflected in the logo design. We chose a comet because it is a strong dynamic symbol, and brings movement and action to the corporate identity. By combining the icons of the comet as well as that of a planet, we created a strong motif that represented most, if not all, of the principles we were striving for. The logo showcases the company as honest, intuitive, fun, active, hi-tech, design, fulfilling, non-linear, structured and sci-fi.

The logos on the opposite page shows a sample of some of the variations we were considering, and how we moved toward the final design you see below.





Finalizing The Story

After the random rough plots were generated, we examined them for potential game design. After we analyzed them, we decided to take some of the best aspects from several to use in the final draft. The main plot however, remained true to Talos' original idea; that of an android seeking to become alive. Because that story line seemed to offer the best and widest range of possibilities for story telling, we decided to focus on it and brainstorm the final story around these ideas.

What emerged was a sweeping, almost epic, story of an android thrust into "life" by a seemingly freak accident, who has to discover who and what it is. The story for the prototype took the form of four main branches (see figure 3B), and from those, numerous other branches that lead to completely different locations and plot lines. The player would always start at the same location, that of Dr. Alexia Icona's laboratory on the planet of Dannatt. From there however, it would be up to the individual player to decide which direction to go and what destiny to seek

The entire story for the prototype is provided on the following pages. The first information provided on the opposite page is a timeline of events leading up to the activation of the android, a kind of pre-Live It! history. This is followed by a description of Dr. Icona's lab (the starting location). The different branches that follow will be marked by a number in a circle similar to the one in figure 3B. This number denotes what branch that particular story is following.

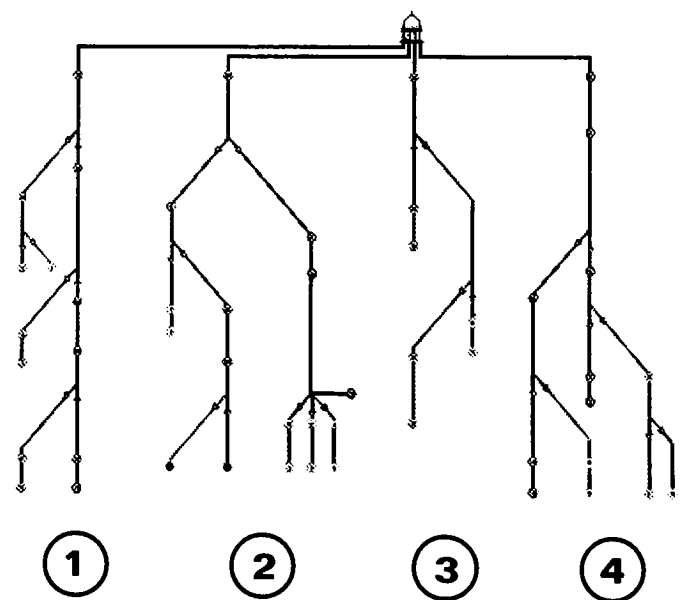


Figure 3B

The game structure for Live It! resembles an upside down tree, with the "root" or starting point at the top. From there, the story "branches" into four main parts. Unlike other CD-ROM games that claim to have branching storylines that really only break off momentarily before returning the player to the main vein, the branches for Live It! keep breaking off and never return to the "root".

Live It! Historical Timeline

The series of events leading to the start of the game

- 240 A group of space travelers called the Senryb arrive on the planet Dannatt. Upon their arrival, they find surface conditions harmful and move underground. They begin a life of seclusion which will not end for several centuries.
- 430 A small village on the planet of Dannatt is formed that will eventually become one of the most revered places in the galaxy. Over the centuries, the Village of Ucar becomes a nexus for social, artistic, and humanitarian endeavours, as well as a favorite retreat for travelers seeking wisdom and knowledge.
- 2090 A race known as the Flohrans flee their world just prior to its destruction. Without a home world, many of the Flohrans spread throughout the universe to help others in need of assistance. They form what will eventually be known as the Star Protectors.
- 2098 A series of interplanetary skirmishes between the insect-like Logotians and the Vokat Empire worsens until total war is waged. The effects of the violent conflict are felt on both sides for generations to follow.
- 2101 Alexia Icona is born on the planet Heltheon 3 to Emilio and Ranaan Icona. She will eventually become one of the premiere minds in history, excelling in philosophy, biology, mathematics and robotics. Considered a genius, she completes her secondary education by age 18.
- 2110 First contact with The Vegan System. The Vegans are greatly spiritual and welcome contact. Over time, it is discovered that the Vegans are being slowly poisoned by their sun. There is believed to be no cure.
- 2117 The galactic corporation known as Odysis sets up a series of research and mining facilities across the cosmos. Odysis sets up one particular station on Vega to try and assist the dying inhabitants as well as make a profit at the same time.
- 2119 Alexia Icona, having completed a stunning under graduate career on Xenon, travels to begin her tenure at the IRIS Institute. Here, she begins the work that will revolutionize many aspects of the future.
- 2122 The scientists from Odysis claim they have discovered a temporary cure for the radiation poisoning of Vega. Odysis resolves itself to finding a permanent cure and begins searching the galaxy for the necessary materials.
- 2124 After having completed her tenure at IRIS, Dr. Alexia Icona begins a journey around the galaxy that will bring her to hundreds of worlds, and take seven years to complete.

The Odysis Corp. discovers a substance known as Ojime in a distant corner of space that will counteract the effects of the Vegan sun. In exchange for the Ojime, Odysis offers a trade to the Vegans, the Ojime for another mineral discovered on Vega called Onyxite. The Vegans agree.
- 2127 Supplies of the critical mineral Ojime are found in several asteroid belts in key star systems. Odysis spends the next decade setting up many stations to mine the element, as well as establish a distribution network.
- 2131 Growing restless with her travels, Dr. Icona decides to search for a suitable location to continue her work in private. The search takes her to the remote world of Dannatt in the Galeb star sector.
- 2134 Dr. Icona Sets up her base of operations in an ancient Dannattian temple. The local Star Protectors assist her transporting and setting up her equipment so that she can begin work on her life-long dream, a fully functioning sentient android.
- 2135 Reports of a new weapon in the age-old war between the Logotians and the Vokat Empire surface. Unknown to everyone except the Odysis Corp., the weapon is a virus grown from samples of Onyxite.
- 2139 Dr. Icona is called away just prior to the completion of her work on the android by an emergency at the orbiting station above Dannatt. Reluctant, but always willing to help others, she leaves for the station above. Dr. Icona never returns.
- 2153 An asteroid high above Dannatt, breaks orbit and comes crashing down just one kilometer away from the now deserted laboratory of Dr. Icona. The blast from the collision triggers the near-complete circuits of the Log.I.C. android (the player), and the player awakens to find an empty lab, some tantalizing clues, and a universe full of possibilities.

The Laboratory on Dannatt

Dr. Icona's laboratory on Dannatt serves as the start of the story. An asteroid hurtles through the atmosphere to land in a blaze of light in a remote desert region. The blast triggers a strange electrical storm, and Dr. Icona's lab suddenly appears. The lab's ability to cloak itself from the outside world is now gone. On the second floor of the structure, an android awakens to find itself lying flat on a work table. The android is the form the player will take for the adventure.

Contained within the lab are several devices and clues that could possibly aid the player if she/he so chooses. Among these are Dr. Icona's log entries, video messages for Dr. Icona, the Digital Cloak, (which allows the user to disguise him/herself as a different sex for a short time), and the Dimensional Shifting Chamber which allows the player to transport away from the lab and choose the route that will initially be followed.

The player is able to gain access to Dr. Icona's log entries by breaking a code left behind by her. The log entries provide the player with the story of how the android was constructed, as well as some foreshadowing of people and events that the player might encounter at some point in the future. Dr. Icona tells how she was able to build the android with great strength and intelligence, but was not able to give it life. She did say that she thought it would be possible if she only had a little more time.

The player may choose to stay and explore the environment for a time, or the player may choose to leave immediately. Staying may provide several additional choices for destinations as well as the ability to disguise her/himself. However, there are four primary destinations, and from there each route has many sub-routes. It is from here, that the player first dictates the direction of the adventure. Choices that are made influence what can and will be possible from this point forward.

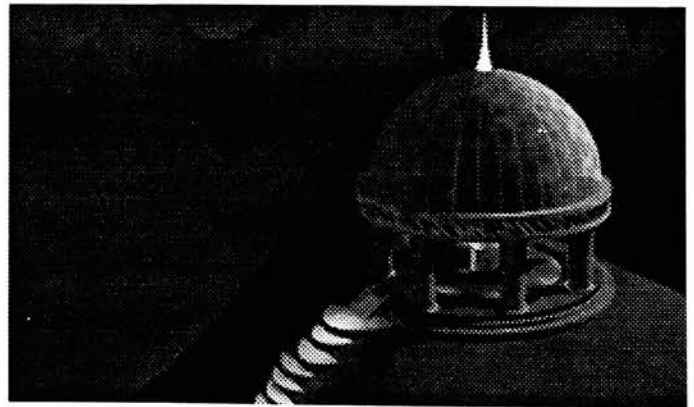


Figure 3C

The ancient Danattian temple that Dr. Icona converted into her laboratory. The structure serves as the starting point of the game, and the jumping off point for a multitude of possible destinies.

Path 1

The Village of Ucar

-Social Issues: How aspects of society such as art, poetry, religion, etc. influence culture.

The player materializes in the center of a small village. The environment is quiet, peaceful and serene. An occasional villager can be seen going about his business. The player encounters an inhabitant of the village, and if questioned about this place, the man tells the player that in order to understand about his home, it is necessary to seek out and understand the various elements of his culture that have allowed it to prosper and flourish. The player must seek out eight people in the village and discover what their part is amongst the whole. After each person is visited, the player is given a segment of a parchment that explains the history of the village. Each aspect of their culture comes together to form a complete society where everyone is useful and needed in the community.

Choices:

- Find the eight segments (1)
- Leave the village (2)

(1)The Eight Segments

Social Issues: How aspects of society such as art, poetry, religion, etc. influence culture.

The player journeys around the village of Ucar and speaks with individuals who are experts in their individual fields. The player meets poets, doctors, artists, scientists, priests, architects, scholars, and philosophers. After speaking with each, the player is given a small segment of a large parchment. When all eight individuals have been visited, the pieces must be assembled to reveal the history of the Ucar people. The history tells of two ancient temples that were built by the Ucar people centuries earlier. These two temples were places of great worship and were centers where the Ucarians could "speak to God". Upon closer examination, one of the temples bears a striking resemblance to Dr. Icona's lab. The other temple is rumored to be in a distant land, but since the village is surrounded by a desert, none of the Ucarians have been able to make the journey and survive. Since the player is not a humanoid but an android, she/he must make a decision: whether to reach this mystic temple in an attempt to communicate with God and possibly become alive, or to remain in a place where everyone regards even an android as a valued member, who in their minds, is alive.

Choices:

- Stay in the village (3)
- Leave and search for second temple (4)

Path 1 Continued

(2)The Old Man

Social Issues: Trust and theft

The player chooses not to explore the village. If after a certain amount of time has elapsed and no segments have been discovered, the player meets an old man who asks for help. He explains that in order to buy food for himself, he needs money. There is an artifact near the center of town that he could sell. He is too old however, and he asks the player to bring it to him. The storyline was not expanded beyond this point.

Choices:

- Assist the old man - ?
- Do not assist the old man - ?

(3)Life In Ucar

Social Issues: Unknown

The player chooses not to leave the village. The villagers welcome the android as one of their own. The storyline was not expanded beyond this point.

(4)The Wastes of Dannatt

Social Issues: None

The player decides to set out in search of the second mystical Temple of Knowledge. A path leads out of the town and into the vast desert beyond. The villagers gather to wish the android well on its journey. In the far distance can be seen the faint image of mountain peaks. There is a clear path in the sand where others have obviously started their journey. As the path gets further and further away from Ucar, it gets less and less defined.

The Mirage

Social Issues: None

At one point on the journey to the mystical temple of Knowledge, the player turns to spot a strange image on his/her optical sensors. The image appears to be some kind of mirage which the android's internal processors cannot compute. Though distant, the mirage can clearly be reached by traveling in a straight line. - ?

Choices:

- Investigate the mirage (5)
- Keep searching for second temple (6)

Path 1 Continued**(5)System Failure**

Social Issues: Old age, physical impairments

Upon arrival at the mirage, the android's systems begin to fail one by one until the point of complete system failure. The last system to go is the optical sensors, and the player's field of view goes black. When the android's systems come back on line, the internal chronometer read that it is 106 years into the future. Although the optical sensors are functioning, the field of view is very distorted. In addition, the audio feedback is garbled and sounds are difficult to define. A voice can be heard of a person who tells that he reactivated the android's systems after he removed it from that location. The storyline was not expanded beyond this point. - ?

(6)The Temple of Knowledge

Social Issues: Religion in culture

The android reaches the Temple of Knowledge. There it confronts the ancient "God" of the Ucarians. The "God" is in reality, a powerful source of energy of an unknown origin. Whatever the energy is, it seems to have the ability to sustain life, as is evident by the amount of plant life in and around the temple. The energy might hold the key to becoming a real living being, but it might also prove to be harmful to electronics and circuits. The storyline was not expanded beyond this point. - ?

Path 2

Pegasus 7

Social Issues: Law & order, justice, morality.

The player materializes in the hallway of a large alien spacecraft. The ship is the spacecraft of the Star Protectors, a kind of intergalactic coast guard. The Protectors patrol this particular sector of space and enforce the laws and mores of their organization. The protectors respond to any calls for help as well as assist any ship or individual in need. After materializing, the player is assaulted by loud sirens and flashing lights, an alarm has sounded indicating the presence of an intruder. The appearance of the player has sounded the the alarm and the situation is critical. To the player's left is an escape pod which is easily accessible.

Choices:

- Stay and face the consequences (1)
- Take the pod to apparent safety (2)

(1)Clear Yourself

Social Issues: Justice, law & order, morality

The player is taken into custody by the Star Protectors, and is questioned as to why the pod was taken. The android is released shortly, after it is realized the whole event was a misunderstanding. The android makes its way to the bridge and witnesses the events that follow.

The Sun Worshippers

Social Issues: Justice, law & order, morality

The Star Protectors receive a call from a ship in distress. The ship belongs to the Akanar, a race of people on their way to sacrifice themselves to the sun. Part of their religion states that when a person of their culture reaches a point when she/he is no longer useful (such as extreme age, or sickness), they leave their world to join the sun. The ship contains about 1,200 such people and the ship's engines have developed a malfunction. The Akanar have called the Protectors to help them repair their engines so they can complete their journey. The repairs proceed, and will take some two hours to complete.

Path 2 Continued

Talk To Crewmembers

Social Issues: Justice, law & order, morality

The player has the opportunity to wander throughout the ship and talk to different members of the crew of Pegasus 7. It becomes apparent that not all of the Protectors agree with the Akanar's beliefs and wish there was something that could be done. They are bound however to follow interstellar law and must oblige the Akanar in the end. The Commander of the Protectors tells the player that she also feels it is wrong that these people will go needlessly to their deaths. There is nothing she can do to help, but if the player would like to take one of the Pegasus' shuttles over to the Akanar, the player might be able to convince some of them not to sacrifice themselves to the sun after all.

Choices:

- Take the shuttle to the Akanar (3)
- Do not meddle in the Akanar's affairs (4)

(2)Escape Capture

Social Issues: None

The player has stolen the Star Protectors' pod. However, once it is discovered missing, the Protectors give chase to recover the missing vehicle. The pod is small and not very fast, and the Protectors will most certainly capture the player unless the player makes a critical turn toward a strange spacial anomaly.

Choices:

- Set course for the spacial anomaly (5)
- Get taken into custody by the Protectors (6)

(3)The Fate of The Akanar

Social Issues: Unknown

The player decides not to get involved in the belief system of the Akanar and asks the Protectors if she/he can borrow a shuttle to be on her/his way. The storyline was not expanded beyond this point. - ?

Path 2 Continued

(4)The Promised Planet

Social Issues: Unknown

The player travels to the Akanar and pleads with them that no one must die. Those who wish can leave with the android and try to find a new home. Some of the Akanar agree and leave with the player, others stay behind to fulfill their beliefs. The group travels to one of three planets that they will call home. The three planets vary greatly in surface conditions, but there is only enough fuel to choose one. The storyline was not expanded beyond this point. - ? ? ?

(5)Time Warp

Social Issues: Love, commitment and relationships

The player escapes the wrath of the Protectors by entering a time warp and is projected into the past. The pod ends up near a planet in a distant corner of the galaxy, some 75 years from where she/he just left. This storyline was not expanded beyond this point, it will deal with the possibility of the android developing a relationship with a person she/he encounters in the past. - ?

(6)A Silent Witness

Social Issues: Justice, morality

The Protectors capture the player and put her/him on trial for the theft of their pod. It is decided that the android be exiled to jungle planet B1 in a nearby star system. However, before this happens, the player is witness to the arrival of the sun worshippers. Although their plight may have been an event that could have been altered before, now the player can do nothing. By becoming the prisoner of the Protectors, the android must stand and watch as the sun worshippers' fate is decided by intergalactic law.

Path 2 Continued

The Plant Creatures

Social Issues: Communication & language

The player is exiled to jungle world B1 where the leaves of the plants keep changing colors. At first glance, the strange colors seem like a natural cycle, but in reality it is the plant creatures' mode of communication on Antilon 1. The plants are being slowly poisoned by a material in the wreckage of a crashed ship and they are crying for help.

Choices:

- Translate the alien code of the plants (7)
- Can't /won't learn to communicate with the plants (8)

(7)End Of Game

Social Issues: Communication

The player learns to communicate with the plant creatures and helps them from being killed off by the toxic chemicals, using itself as a shield generator to protect the plants. The android becomes a permanent member of the society as a plant (even though it is a machine). Over time, the natural plant life of the planet overgrows the android to form a wise old tree, part plant, part machine.

(8)End Of Game

Social Issues: Communication

Since the player was not able to learn how to communicate with the plants, the plants die off over a great period of time to leave the android alone on a vast desert planet for 220 years until its power source runs down.

Path 3

The Hadese Catacombs

Social Issues: Poverty, social inequality

The player materializes inside a strange alien tunnel deep under the surface of Dannatt. The android has come to the underworld of the Senryb, a strange and reclusive race of aliens that ventured to Dannatt many years ago. Only a few individuals have ever had contact with the Senryb due to their xenophobic nature. Before the player lies a strange tunnel that continues on in two directions. At one end of the tunnel is a hole that drops down beyond sight. At the other end is a strange path of light that is connected to a maze that ranges out of sight.

Choices:

- Jump down the hole into the unknown (1)
- Attempt to navigate the maze (2)

(1)The Lower Levels

Social Issues: Poverty, social inequality

The player decides to jump into the blackness of the hole. The android falls a great distance, and the force of impact damages several of the android's systems. Most notably among these is the android's power supply which loses 25% energy. The android stands to face a few dozen Senrybs that were obviously startled to see an android drop down in their midst. The aliens begin to communicate to the player and through several conversations, the player learns of the society and culture of the Senryb. It is explained that the android has fallen to the lower levels of the Hadese Region. These levels are the realm of the lower class, the worker. The ruling class lives many kilometers above in relative comfort. It has been like this for many generations with the Senryb, even on their home-world where there were distinctions between the classes. It did not become so extreme until they came to this planet and went underground. - ?

Path 3 Continued

(2)The Maze

Social Issues: None

The player decides to attempt the maze in order to try and find an exit. While searching through the maze, the player comes across a strange portal in the blackness of the background. The portal appears to be a gateway leading to an unfamiliar landscape on some distant world. It is obvious that the portal is large enough for the player and might be able to transport him/her to what lies beyond.

Choices:

- Step through the portal (3)
- Keep searching the maze (4)

(3)Gilanda

Social Issues: Unknown

The player steps through the portal into the mountain region of another planet in the system called Gilanda. - ?

(4)The Upper Levels

Social Issues: Poverty, social inequality

The player navigates the maze successfully and comes to a large metal door. Beyond the door is a great open chamber with three sets of glowing eyes at the end. The player confronts the three Senryb standing motionless in the darkness as they begin to speak. They recount the warning that they issued to all humanoids in the system not to visit them. They ask the android why it has decided to ignore this warning. This storyline will branch depending upon whether or not the player used the digital cloak before leaving the lab to come here. If the player is disguised as either a human male or female, the Senryb's judgement will be more harsh, if the player has not used the digital cloak, the Senryb will most likely be more understanding. - ?

Path 4

Odysis Mining Facility

Social Issues: Greed, politics self-sacrifice.

The player materializes inside a hallway of the Odysis Mining Facility station in orbit around Dannatt. The station was set up by the Odysis Corp. many years ago to mine a substance known as Ojime. Ojime is the only known cure for a deadly disease that runs rampant on the distant world of Vega. The substance provides only temporary protection however, and has to be constantly shipped to protect the dying. The android explores the station to discover that it has been abandoned some time ago. The story of what events took place on the station are detailed in personal logs and records scattered throughout the facility.

The Log Entries

Social Issues: Greed, politics self-sacrifice.

Several entries are discovered that were left behind by the android's creator, Dr. Alexia Icona. The mining facility was the emergency that she was called away to help deal with. Once she assisted the station administrator deal with a deadly virus that was killing off the station's crew, she decided to stay on as their doctor until a replacement arrived. Being the curious individual that she is, she began to investigate the company and unearthed some very disturbing facts about Odysis. As her digging revealed, Odysis was not really aiding the Vegans with the deadly plague of their world, but was in fact exploiting them for Odysis' own ends. Upon this discovery, Dr. Icona set about making a real cure for the Vegans in secret. When the station administrator found out what she was attempting, he decided to eliminate her for the good of the company. His attempt failed, but in the process, several of Dr. Icona's friends on the station were killed. Before she escaped she split the formula for the cure into several pieces around the station in case something happened to her. She never had the chance to complete the cure and send it to the Vegans.

Choices:

- Synthesize the cure called Vaxinex (1)
- Do nothing about the unfinished cure (2)

Path 4 Continued

(1)Vaxinex

Social Issues: Morality

The player decides to piece together the clues left behind by Dr. Icona to re-construct the cure for the Vegans. After the cure is complete, the player finds a small pod that could fit both the Vaxinex as well as her/himself for the journey to the Vegans.

Choices:

- Send the cure by itself and leave on a shuttle (3)
- Travel with the cure to Vega on the pod (4)

(2)The Search

Social Issues: The quest for one's origin.

The player decides not to piece together the clues left behind by Dr. Icona to re-construct the cure for the Vegans. The android finds a shuttle bay with one ship left. The android boards the ship and leaves the station.

Choices:

- Set course for planet Vega (5)
- Try to follow Dr. Icona's trail (6)

(3)The Shuttle

Social Issues: Unknown

The player sends the pod with the cure on its own way to Vega. It may never be known if it arrives safely. The player sets out in the last station shuttle for the unknown. - ?

(4)The Cure Arrives

The player arrives on Vega with the Vaxinex. Depending upon whether or not the player is cloaked as a male or female or is simply seen as an android will have an affect on how the player is received by the population. - ?

(5)The Black Hole

The player decides to set course to try and find Dr. Icona. During the journey, the player encounters a black hole, this may or not be what happened to the creator.

Choices:

- Set course for the black hole - ?
- Ignore black hole and continue on - ?

Graphical User Interface (GUI)

The graphical user interface is the means by which the player or user can directly interact with his/her environment. The interface provides such things as buttons, informational displays, animations and feedback. In the case of *Live It!*, the interface was also required to have navigational controls, windows for QuickTime movie playback, status indicators and so on. All of this had to be designed into a cohesive whole that was clear and easy to read and understand.

It was very difficult to design the user interface since we wanted to be different from other currently existing games. *Iron Helix*, *The Journeyman Project* and *CHAOS* are based on directional control (that is to say the controls for the players direction are most prevalent), where as *MYST*, *Spaceship Warlock* and *Hell Cab* use a simple point and click interface.

In the first example listed above, actual image area is limited because of the control buttons. Usually, especially in the case of *Iron Helix* (see figure 2A) the size and placement of the directional controls occupies the most "real estate" on-screen. The second example (point and click) have the advantages of large image areas, but do not allow for more complex interaction such as picking up objects, conducting "scans" of the area, and talking to people. After a great deal of brainstorming and sketching, we settled on a new approach to the interface design.

Since the view the player was to see the entire game was that of a first person view from the robot, why not make it look as if the player was seeing through the eyes of that advanced robot? This line of reasoning would allow for a multitude of possible controls and interactions because the interface could always adapt to fit a new situation or locale. In this manner, we would have more image area for larger more visually exciting environments, and small windows inset in the interface for animations that would disappear after they were done. Information could appear in the middle of the screen with the background "screened back" to provide temporary data. To navigate, the player would simply click on the word left, right, forward or 180°, and that way, it would be different from other game control buttons, as well as make sense for the context of the controls.

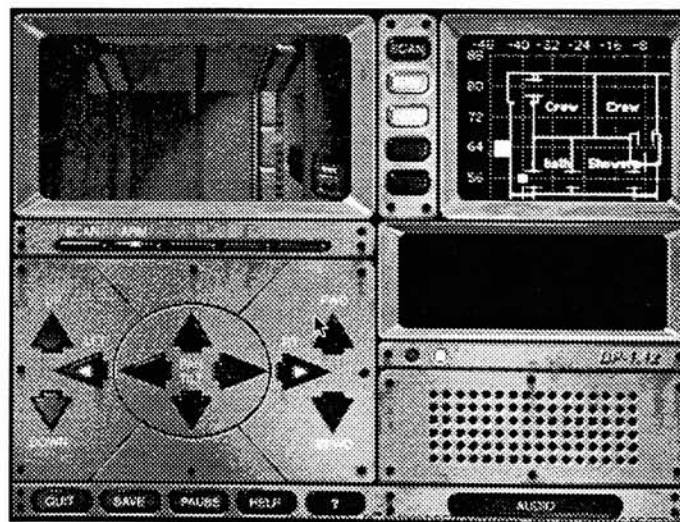


Figure 2A

The interface design for *Iron Helix* centers the primary visual focus on the large directional controls at the bottom left. By designing the interface in this manner, with such a small image area (at the top left) the game is able to provide smoother animation by changing only a small amount of the screen each time.



Figure 2B

Graphic influences for the interface design for Live It! can be seen here in these shots from RoboCop 2 and Terminator 2 respectively. Both feature on-screen text displays and a distinctive "computer" feel. The example from RoboCop also depicts "window in window" technology that was prevalent in Live It!.

Research into the area of on-screen displays led us to several sources, among them the film series of *RoboCop* and *The Terminator*. Both featured robot or robot like characters that used advanced on-screen or "heads-up" displays in their field of view. Text was a common element as well as technical looking graphs, inset pictures, and window in window animations. To push the look of these on-screen displays further, and to give the Log.I.C. android a distinctively "robot" feel, it was decided to add the visual element of the grid directly on top of the field of view. The grid would serve as a constant reminder that the player was not human, but rather a robot. It also helped to convey the feeling that one was looking out through a kind of "camera analysis" throughout the game, and finally it would serve as a visual clue that the player had become a human should it disappear at some point during the game. The addition of the grid posed new problems dealing with legibility, visual interference and so on that also had to be dealt with.

After we finalized the design, we needed to test the various typefaces, sizes and colors to distinguish which combination had the highest degree of readability. Some typefaces that were tried were: Futura, Helvetica, OCRA, Courier, Bodoni, Eurostyle and Microgamma. In order to keep the display type looking as technical and computer-like as possible, it was decided to use a sans serif face. Eurostyle was decided to have the best overall readability on a variety of backgrounds, and yet still looked high-tech enough to convey the appropriate feeling.

The color choice of the type was difficult to test. Since the type had to be displayed on top of an ever changing series of background landscapes and color schemes, it was difficult to find a single color that worked well against all of them. After much testing, we decided upon a type of orange that was particularly bright in saturation in order to stand out from the background. In addition, we decided not to use that particular shade of orange in any other objects that would be in the backgrounds, thereby giving that orange singular importance. A black drop shadow was added for legibility in case the type was to fall against a very bright background such as a sky shot. We decided to set the color standard for the interface so that orange would represent interactive controls, and gray would represent information based items.

The shape of the image area is similar to a wide screen movie, with an image area of 640 x 336 pixels. Extra information would show in the black areas on top and bottom to utilize the screen and still maintain the image quality. The special part about this interface is that it can adapt and change. Icons or text could appear as needed. That's the strength of this interface, on-screen and adaptable.

Grid Construction

The grid of the user interface began construction as an Adobe Illustrator file (top). The grid lines were drawn in sequence in Illustrator to make the appropriate aspect ratio for the game screens. Once the lines were drawn, the file was saved as an Adobe Illustrator file for import into Adobe Photoshop.

Next, the file was opened and rasterized in Adobe Photoshop at 72 pixels per inch. The grid was then inverted using the Invert command. This changed the white pixels to black and vice versa. This was important because in order for the grid to be applied as a selection, the area to be lightened (the grid itself) had to be made up of white pixels (middle). At this point the grid lines were touched up and sharpened before the next step.

Next, an elliptical area was selected using the circle marquee tool in Adobe Photoshop. The option key was depressed to select from the center out to obtain a selection that was in the middle of the grid. The size of the selection was decided upon after several tests. Next, the selection was feathered using a setting of 35 pixels in the feather dialog box, and then the feathered selection was filled with black (bottom).

Lastly, the file was saved again under a different name and was then ready for use as a channel. The reasoning behind the "blacked-out" area at the center of the grid was so the grid would not interfere visually with objects at the center of view. We felt it was important to have the grid be visible, but not to draw too much visual weight to itself. By blacking out the center, as well as finding the optimum level adjustment (see next page) a balance was struck between visual harmony, and having the grid be a conscious part of the interface.

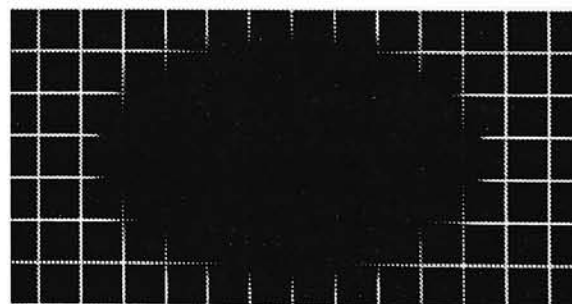
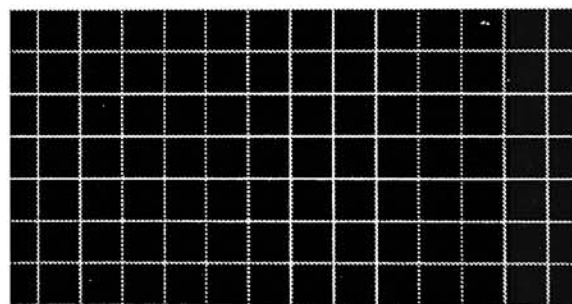
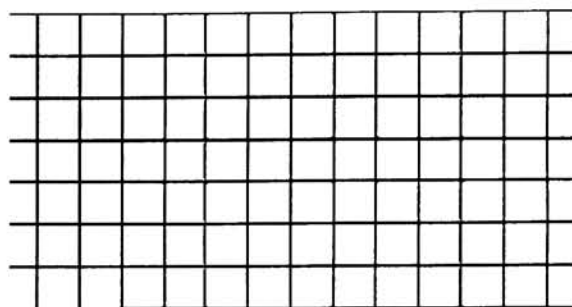


Figure 3C

The three steps for the creation of the interface grid. The Adobe Illustrator file (Top), the imported Illustrator file inverted in Adobe Photoshop (middle) and the final channel-ready version with feather adjustments (bottom).

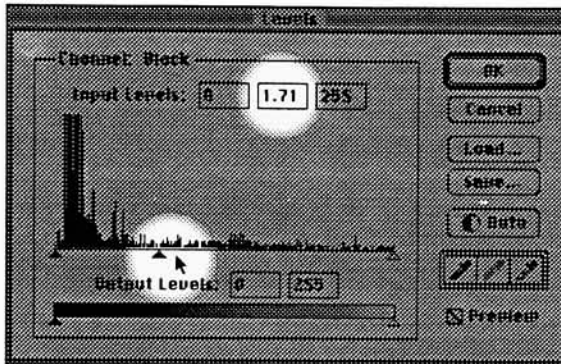
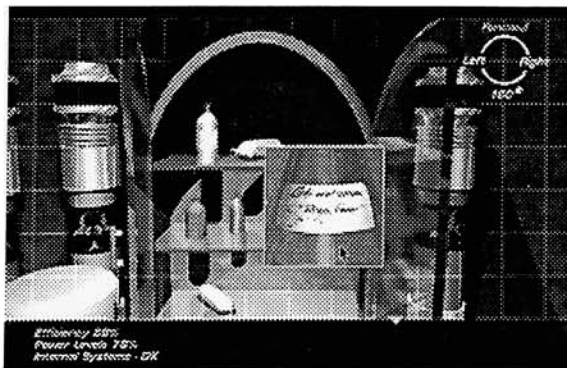


Figure 3D

The grid application begins with the original game image (1st). After the grid channel is loaded in, the levels are adjusted (2nd) and the final image is ready to be placed into the game shell (3rd).



Grid Application

Since the grid was to be visible in every view of the game, it was necessary to develop a system that would allow consistency throughout production. Once that system was defined, we documented it so that each view would have a consistent look to the grid.

The process for each frame began by opening both the game image to be modified as well as the grid channel PICT in Adobe Photoshop. In order to load the grid into the game image a new channel had to be created called "grid channel". This was channel number 4 of the RGB mode. Once the channel was created, the grid was copied and pasted into this blank channel.

Next, we returned to the main RGB channel and loaded the "grid channel" selection. After hiding the edges to get a better view of the changes to be made, we went to the adjust levels dialog box. By adjusting the mid-tones to 1.71, the selection containing the grid lines was lightened to the appropriate amount (see middle diagram). After the adjustment in levels was made, the grid was de-selected and the image adjustments were completed.

Some individual scenes of the game contained very dark or even black areas. This was especially true for the Hadese Region screens as well as the Odysis Mining Facility screens. Due to the dark nature of these areas, some of the grid lines were not lightened to the same degree as the rest. It was therefore necessary to select these areas manually and perform additional lightening to them. After this was completed, these areas appeared to have been adjusted to the same degree as the rest.

A Unified Interface

With the addition of the grid, as well as the on-screen text, the navigational controls, the ability to "zoom" in and take a closer look at objects, window in window animations and informational charts and graphs, the user interface for *Live It!* comes together into a cohesive whole. All these elements help to give the player the sensation of being an advanced android with many abilities and features. The ability of the interface to adapt and change sets it apart from other similar adventure games currently available. Finally, the way the different elements are designed to interact on the screen allows the player to enjoy the exotic environments while still being able to interact with them and get the info he/she needs to complete the game.

Design & Visualization

Many of today's interactive CD-ROM adventures make use of realistic, 3-D environments that have been created in such programs as Electric Image, RenderMan, and Strata StudioPro. We chose the latter partly because we were already familiar with the predecessor to StudioPro, Strata Vision 3D and also because we were eager to test the update's functions.

Creating a believable environment takes more than good software however. Like any other aspect of game design, the environments, locations and objects that the player interacts with must be well thought out and designed. Like a film maker choosing the appropriate location on which to shoot the first scene, we had to decide what each part of the game would look like. We took the text descriptions of the places, people and objects that we had created and began giving them form and style on paper in the form of sketches. These sketches (or storyboards as they are called) served as a blueprint for nearly all of the things encountered in the prototype of *Live It!*. The translation from sketch to actual model is a process that will be described in the following section.

The design for the player's character, the Log.I.C. Android was dictated by both the story, our imaginations and what the software allowed us to create with the equipment and time allotted. Log.I.C. was intended by its creator (Dr. Icona) to be the state of the art in android design. Before she could complete her dream however, she was forced to go and left Log.I.C. unfinished. Because of this we wanted the design of the android to reflect this feeling. Since the player would at times see him/herself in a reflective surface (such as a wall or mirror) it was possible to let the player "see" him/herself. With this in mind the android's various body parts have the look and feel of being "incompleted". Certain panels are missing and other areas of the android's body are exposed that might otherwise be concealed by smooth plating.

In addition, since it would be possible for the player to eventually disguise him/herself as either a man or a woman, we wanted the body frame of the android to be as generic as possible to lend creditability to that aspect of the story. Other areas such as Log.I.C. having three lenses for eyes were decided on the basis of trying to create a type of robot that was visually unique from other robot designs we had seen.

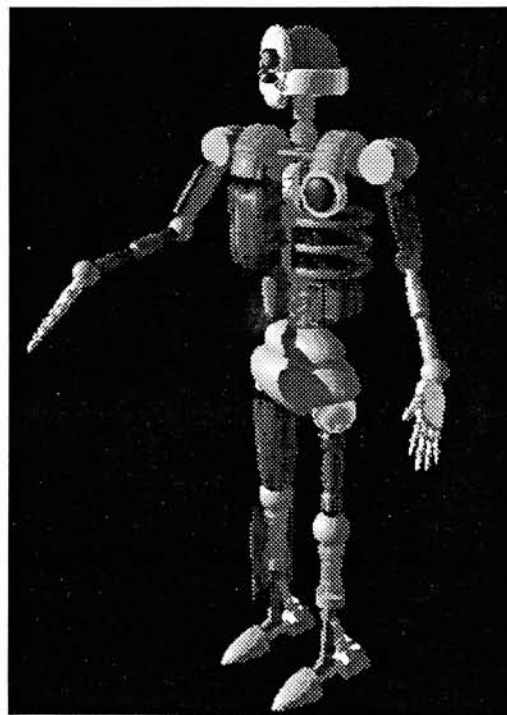
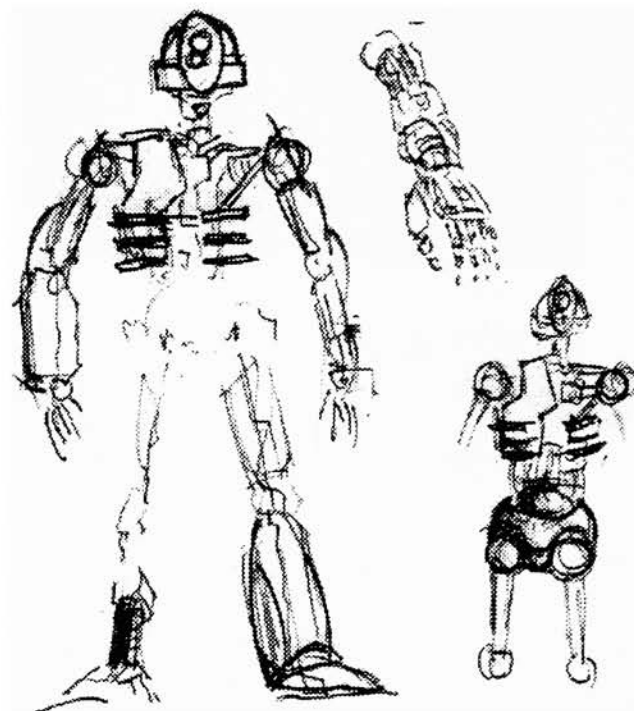


Figure 3E

At top, one of the first concept sketches for the Log.I.C. Android. Note the unfinished or "non polished" look of the design. Below is an actual render of how that production sketch was translated to three dimensions using Strata StudioPro.



Figure 3F
Several production sketches from Live It! that never made it to actual 3-D construction. Shown are (from top to bottom) the layout for the village of Ucar, and character designs for the Star Protectors themselves.

Due to the scope of the game, it would not have been possible to construct all, or even most of the locations, objects and other 3-D elements in the game. We therefore concentrated on only the parts that we established would be seen by the player in the prototype. We did, however, sketch out many more locations and elements than we ended up using. Some examples would be the interior of the Star Protectors ship, the design for the City of Ucar, and some of the characters that the player would eventually meet.

When designing for 3-dimensional environments it is a good idea to have an understanding of how a scene, or object will look from many different angles. If the designer takes this into account correctly, it will be possible to build as realistic a model as is possible. With this completed, and the model as near to reality as possible, the object can be viewed from any camera position and gives the game designers much more flexibility in the way the player moves around and interacts with objects. With this in mind, many of our sketches took the form of side and top views as well as traditional front views. It was important to be able to visualize how these alien worlds and equipment would look and how to explain those visuals to each other as well as our thesis committee.

Visual influences for the design of some of the environments came from current periodicals about interior design. Influences for the Odysis Mining Facility came from several sources including *Star Trek: The Next Generation* and Japanese animation production sketches. It was useful to see how spaces were visualized in some of these cases before finalizing our own designs to begin 3-D construction.

Creating places and environments with such detail that have never really existed was quite a challenge. In order to make the player suspend belief, we wanted to try and pay attention to the smallest of possible details. On many occasions while we Beta tested, people commented that those details really made a difference in how they perceived the game universe. Those details, combined with stylistic visuals and technically accurate rendering, helped to create realistic, and beautiful imagery that the player "lived in" for the entire time she/he was playing the game. And although we only were able to create a fraction of the total 3-D elements, the designs added to an important part of the playing experience.

The Construction Process

Strata StudioPro is a very powerful piece of software. It can carry out functions such as 3-D modeling, texture mapping, lighting, rendering and animation. Used correctly, it is capable of visualizing almost any 3-D designs possible. In addition, the interface is friendly and easy to learn.

When we first build an object or scene, we need to know what the final look of the object will be before modeling in order to select the best possible method for construction. There is always a better or quicker way. Objects can be created three-dimensionally in any number of ways; by extruding a shape back in space, by "lathing" it around its axis any number of degrees, or by pulling points on a simple shape such as a cylinder or cube. Knowing what the final object looks like and how its components fit together enables us to choose the best and fastest method for construction. Sometimes, objects are so small, we don't even need to worry about creating them, because they will never be seen. In addition, if an object is in an area of a scene that the camera will never be focused on, then we either need to move it, or not bother making it in the first place.

Based on the storyline of the game, we designed and sketched the elements needed to be seen or interacted with in the scene. Next, we gathered information before construction to help us either visualize the object or get ideas for other objects. For example, the basement which consists of many different objects, such as a sofa, chair, fireplace and bed. Some of them were created out of the sketches, but some of them were references to existing objects and furniture from interior design magazines.

When we begin to build any object, we have to understand the structure of it. For example, an office chair, consists of the back, the seat, the arms, the legs and the wheels. It is always easier to think of building it in parts rather than the whole thing together. In the case of the office chair, construction began with the arm. First the outline for the chair arm was created in Adobe Illustrator. This outline is similar to a cross-section of the object that when brought into Strata StudioPro and extruded, forms the shape of the arm itself. Upon duplicating it, a double was created that was the other chair arm.

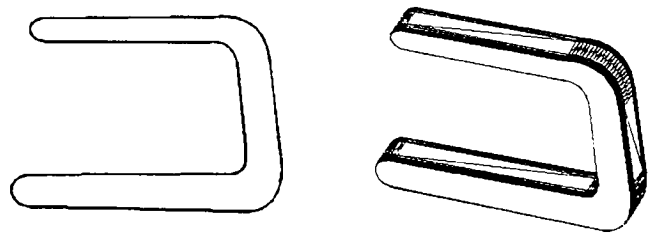
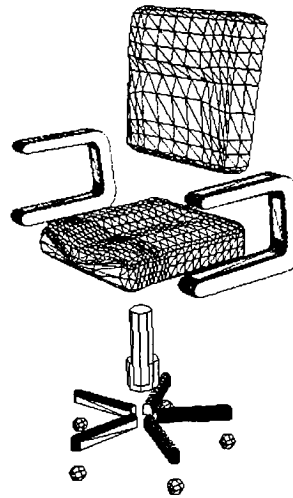


Figure 3G

At the left is the outline or cross-section of the chair arm that was created using Adobe Illustrator. After having imported this shape into Strata StudioPro, it was extruded back in space for the full 3-D version of the arm to the right.

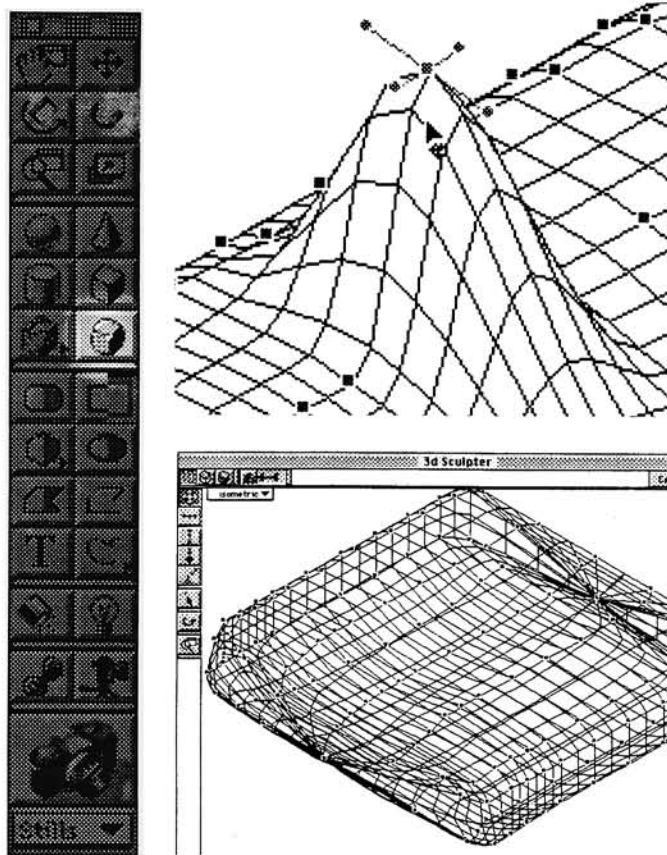


Figure 3H

Using the "Rounded-Cube" tool highlighted to the left, we created what is called "virtual clay," so called because the computer artist can pull and push the shape to mold anything he/she desires. This procedure allows subtle folds and indents in objects like a office seat cushion.

The process for creating the seat cushion of the chair, as well as many other objects that have irregular or "organic" looking folds (like Dr. Icona's bed) are created using a different process. The seat was created by using the rounded-cube tool (see figure 3H), and pulling points on that shape to make the indentation on the seat. Because of the number of points, the various directions these points can take and the effects of each point on the whole shape, this process can be both time consuming and frustrating. If done properly however, this method can be used to create draped fabric, landscapes, and even facial features such as noses, ears and lips. The end result of the seat was a shape that is basically a rectangle with indents and unusual contours. The back of the chair was also done in the same manner.

The legs were created from one basic shape that was modified in two separate ways. The starting shape was an outline that was created in Illustrator that resembled an upside down "U". This outline was first swept 180 degrees to form the end tip of the leg. Next, this same piece was skinned back in space to form the main axis of the leg and the two pieces were joined seamlessly and grouped. By grouping two or more objects, those objects then act as one so that when one moves, so does the other, thereby keeping the two pieces in registration. The "leg" was duplicated four times for a total of five leg units that were rotated at 72° each. These five legs were then placed onto the five wheels that were created simply from spheres, and joined to the legs by simple cylinders. Because there would be little or no focus on the wheels of the chair in the game, no more attention to detail was given to them.

In the last two steps, the various parts were viewed from a different angle (to get a clearer view) and were arranged each in their proper positions in 3-D space to form the model of the chair. This model, like all the models in *Live It!* was saved as its own Strata shape file. In this manner it was easier later on to import individual shapes (such as the entire chair) into a larger model of a constructed scene.

To complete the visual look of the chair, various texture maps were constructed and added to the different parts of the object. Since each part of the chair was in fact its own shape, this made applying different textures to the seat versus the wheels very easy. Some textures were created using Kai's Power Tools: Texture Explorer that we will go into more depth in the following section. With the textures applied, all the parts were selected and grouped once more to form the final chair. This procedure is the basis for all of the 3-D objects that were created for *Live It!*

Texture Creation

Usage of texture is very important for any believable 3D objects or scenes. Strata StudioPro includes a large amount of textures in the texture palette, so that you can just choose the texture you desire for certain parts. You can also manipulate the texture in Strata StudioPro by using the Texture Editing dialogue box. In the Texture Editing dialogue box, you can adjust the clearness, the reflectivity and the color of an existing texture.

You also have the option to create your own textures by importing color, bump, and reflectivity maps, to name just a few. In our thesis, because of the vast amount of objects we needed to build for different scenes, we were required to create many custom textures in order to give every scene a different look with a different color scheme.

Some texture maps were created in KPT Texture Explorer, which can create seamless textures for tiling. Others were downloaded from online services, such as America Online. We also used the Wraptures I texture CD-ROM if a certain texture was needed that could not be created, such as wood. Sometimes, textures such as control panels and monitor screens were created and then mapped onto a flat plane which lay on top of the main objects. We did this because it is not possible to assign more than one texture at a time to a single object.

All these textures (the CD-ROM textures, the KPT textures) were then imported into Strata StudioPro as color maps. A color map is just a flat color image which you can tile on any surface. Color maps such as these allowed us to create stone floors, plastic counter tops and multi-colored couches. If a texture required special shadow and highlight effects, a bump map was also used in conjunction with the color map. A bump map is simply a grayscale version of the texture where the light areas represent raised portions of the texture, and dark areas represent lower areas of the texture. The 3-D software then uses that information when a light source is cast onto the texture to accurately generate shadows and highlights. An example would be the plaque on the ground level of the rotunda with the alien writing on it. Without a bump map applied, the debossed letters would not have cast the appropriate shadows from the light source above.

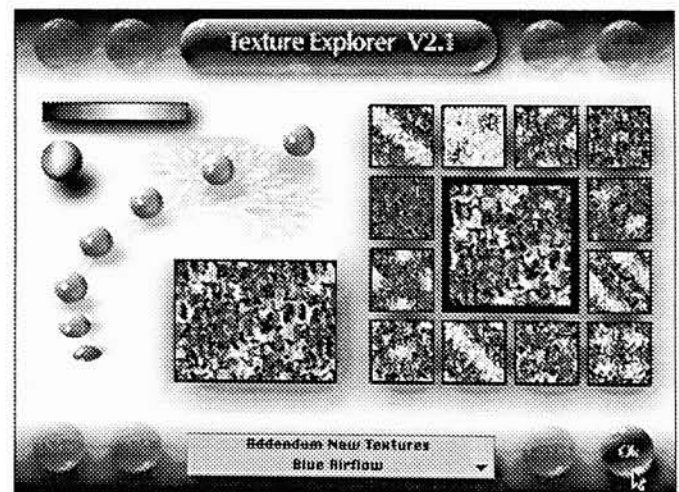


Figure 31

Textures are an integral part of realistic 3-D worlds, and Kai's Power Tools Texture Explorer (at top) is an excellent tool for creating custom textures. It is capable of generating a seemingly endless number of variations of a single texture.

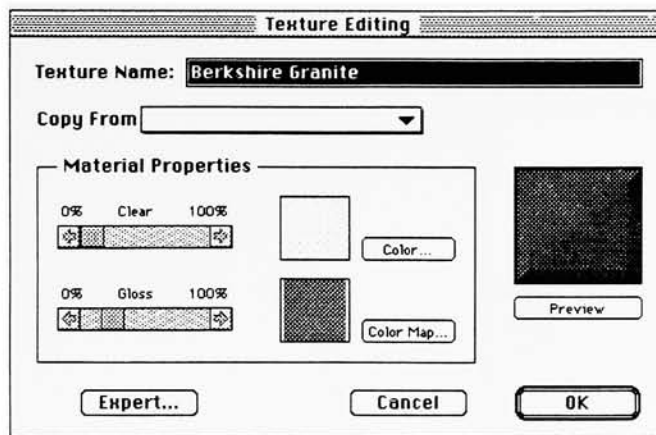


Figure 3J

The Texture Editing dialog box in Strata StudioPro. From here, such properties as transparency and gloss can be controlled as well as importing color and bump maps. A thumbnail version of the texture is displayed at right.

Texture Editing

Once the texture is applied to an object, you can adjust the tiling, the size, the mapping method and the angle of the texture. Detailed control over the textures already built into Strata, as well as the custom textures can be gained by the expert mode of the Texture Editing Dialog box. In this dialog box, numbers can be entered for such factors as reflectivity, glow factor, smoothness and so on. With these additional controls, and the right reference numbers to input, many textures can be made to look absolutely real.

When the time comes to render the 3-D object (to "paint" the picture of it) the more textures used in a scene, the slower the rendering time will be. Applied textures such as reflectivity maps, and bump maps greatly add to the number of calculations per pixel that the computer must deal with. Depending upon hardware and memory constraints, one must calculate the cost of such realistic textures. Is the extra two or twelve hours of rendering time actually worth the wait? Textures combined with lighting, account for the majority of time needed to render an image. The more light sources, like textures, the longer the image will take to render. Lighting will be discussed in the following section.

Lighting

Lighting a three-dimensional model and making it look believable is a very difficult task which requires many rough renderings to make sure the end result of the light sources are correct. Numerous adjustments must be made over and over until the proper affect is achieved.

In order to speed up the construction and rendering time of the prototype, we divided the building of the starting location (Dr. Icona's Lab) into three different levels. Because of the complexity of each level, each contained its own Strata files. For example, the basement itself consisted of many objects, such as a chair, sofa, laptop computer, tea table, toilet, sink, elevator, books and bed, etc. Those objects, and the textures used, makes the rendering time much longer, not to mention the light sources used in this scene.

In Strata StudioPro, there are three different kinds of light sources we can choose from; global, spot and point lights. Global lights act like the sun and can be set to be any color. The difficulty with using global lights however, is that their position is fixed and cannot be moved close to objects or scenes. We didn't use global lights because the scene was of an interior. A spot light is just like its name describes, a spot light that can be adjusted to a wide range of aperture settings. Spot lights can be placed anywhere in the scene and can have "Gels" that allow patterns or colors to be projected from that particular light source. Finally, point lights act like light bulbs by giving off light in all directions at once. Unlike a global (ambient) light however, the position of a point light can be adjusted quite easily.

A typical light source in a 3-D scene would be composed of a sphere with an opening at one end, in which has been placed a spot or point light. Since the spot light itself is invisible, all that is visible is the light source glowing inside the sphere when you look up to the ceiling. This creates the illusion of an actual bulb inside the light source and casts light onto nearby objects, the floor or ceiling.

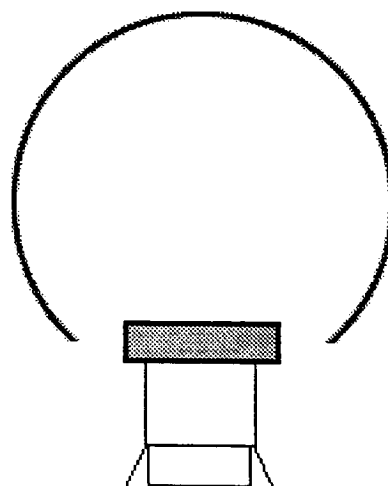


Figure 3K

An example of how a typical light source in Live It! works. A sphere, open at one end, houses a spot light and a cylinder with a texture set with a glow factor. The spot light projects light at a given angle, and the cylinder creates the illusion that the light is actually coming from inside the sphere.

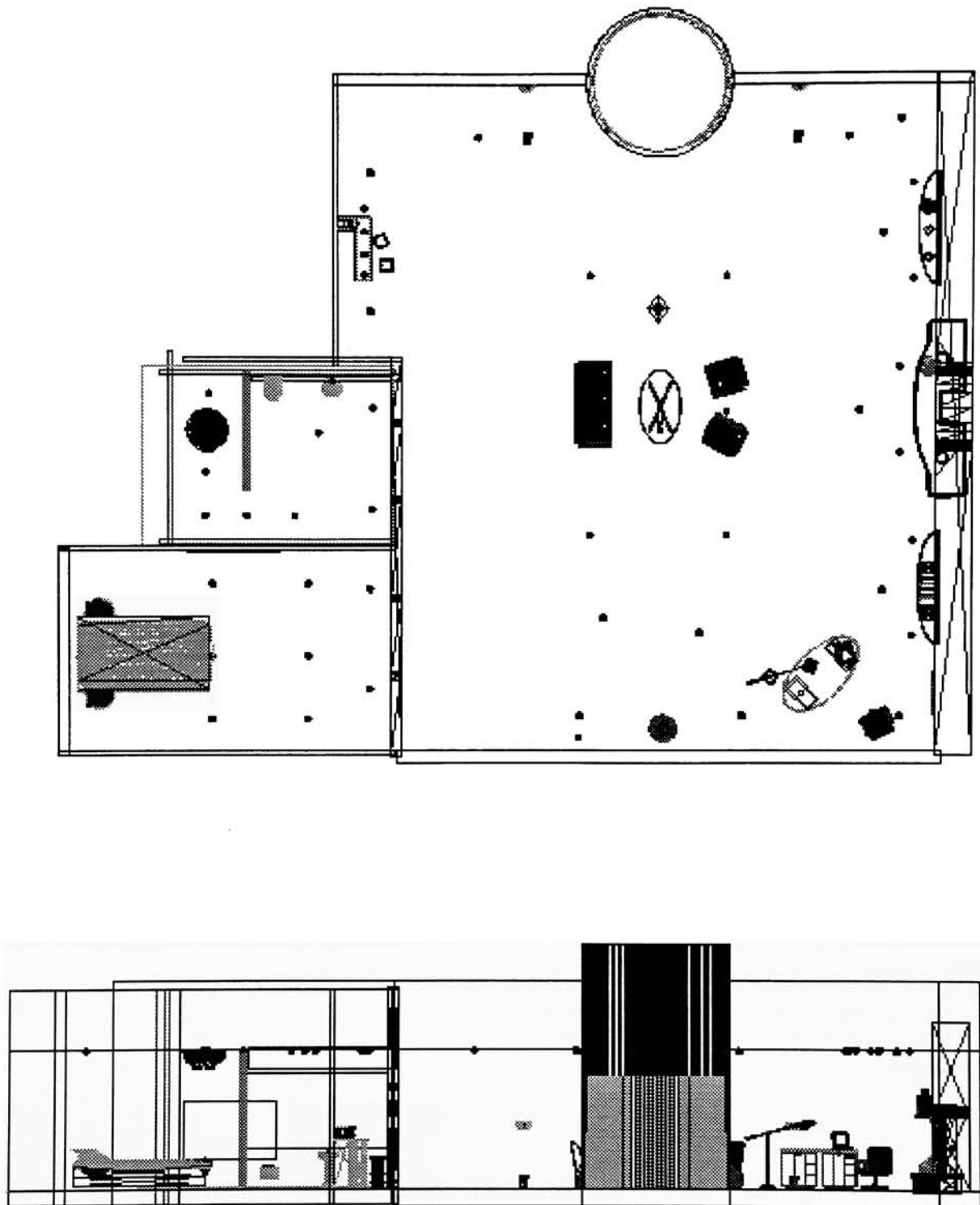


Figure 3L

The floor plan of the basement level showing both the light sources (small circles) and the objects which comprise the scene. Each light source had a definable area that it cast light onto. For a diagram of just the placement of lights, please see diagram **3N**.

Lighting a Scene

After the walls and ceiling were finalized, the furniture and objects that were built earlier were imported into the main model of the basement. When the individual objects of the basement were built, we did not refer to size or scale as a reference. Because of this, many of the objects had to be resized or scaled to fit the scale of the basement. To ensure the correct ratio, we used the model of the robot, Log.I.C., as a reference with all the other objects in the scene.

After the entire model was finished, and all objects were imported into the scene, the light sources were inserted and the angles and directions needed for each light were adjusted. Numerous light sources were required to achieve the desired effect. A point light was added in the middle of the scene which cast no shadow to provide general lighting to the whole environment. Spot lights were added at key locations around the ceiling to cast light on both the floor and the furniture. Small point lights were added to reflect certain highlight tones on edges of objects such as computer panels and control panels. We rendered the scene and adjusted the light sources as many times as was necessary until the result was satisfactory.

It is very difficult, with current software and hardware constraints, to build very complex models such as cities, human figures and detailed interior models. Because of this, one method that we found useful was to build each scene and then "hide" the parts that would not be seen by the camera before they were rendered. This cut down on the time it took the computer to render each image as well as not bothering with useless visual information. By hiding unneeded objects and light sources, we saved ourselves a great deal of time and effort.

The different areas of the prototype required different approaches to lighting and lighting techniques. The above is meant as a reference and outlines the general procedure of lighting a scene, not the total steps that were taken to light all of *Live It!*

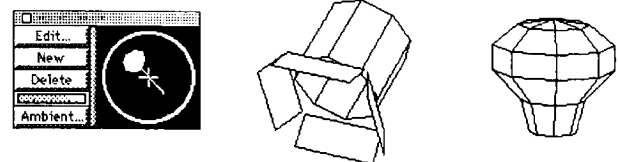


Figure 3M

The three types of lighting available in Strata StudioPro; global, spot and point. Note that global lights can only be adjusted in their relationship to the whole 3-D "world," whereas spot and point lights are free floating and can be moved anywhere in a scene.

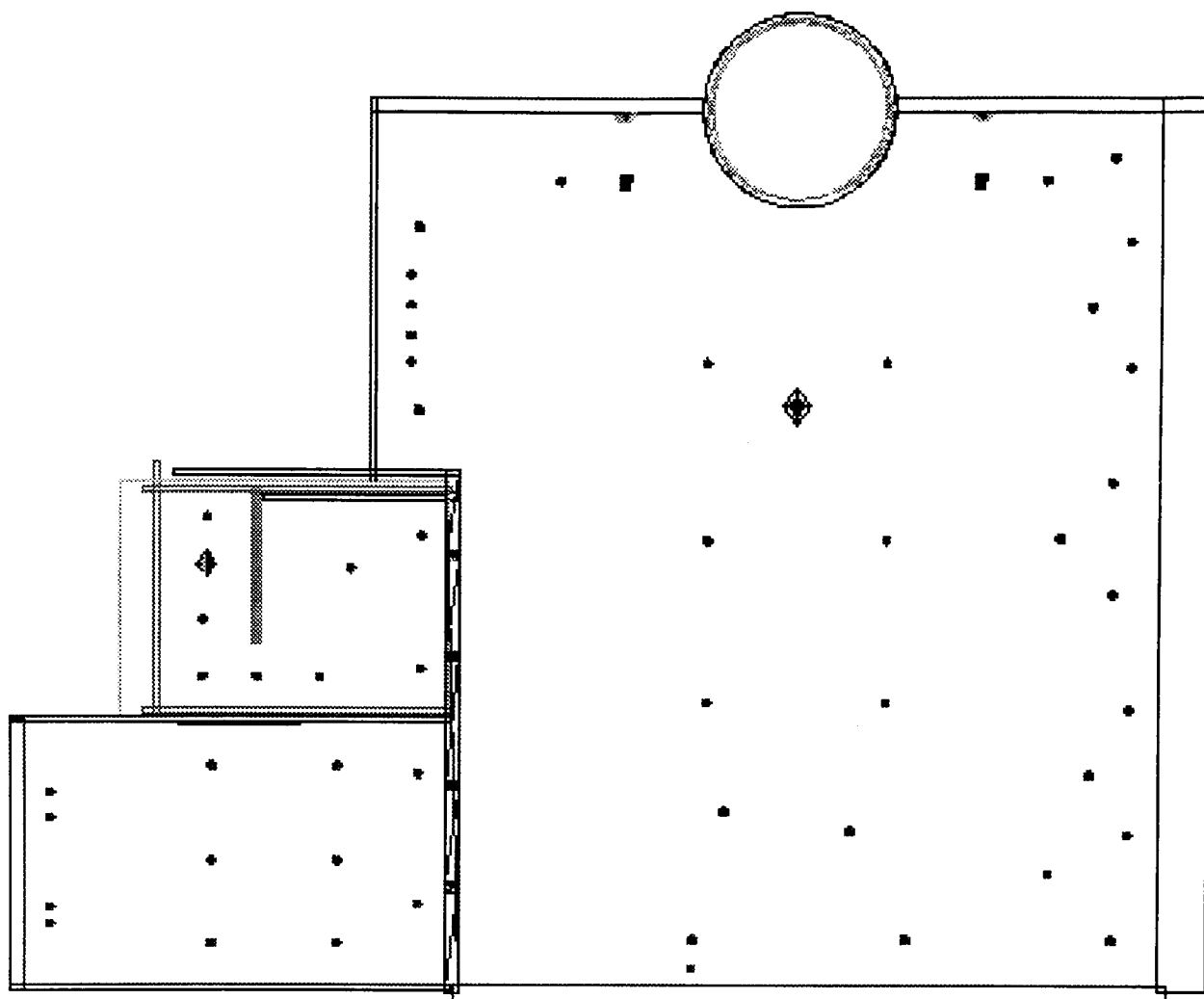


Figure 3M

This floor plan of Dr. Icona's living quarters shows the location of the numerous light sources that projected either onto the floor or objects in the scene. Because of the number of the light sources, this section of the game took exceedingly long to render.

Rendering

Most current 3-D software applications allow the user to select several different types of methods for rendering a completed scene. Strata StudioPro offers four primary methods; Gouraud, Phong, Raytracing and Radioicity. Both the Gouraud and Phong methods are quick, simple processes that are usually used for rough renders to get an idea for what a scene will look like before the final version is rendered. Neither Phong or Gouraud take shadows, reflections or bump maps into account.

For the final images that were to be displayed in *Live It!* we chose between Raytracing and Radioicity. The latter is an extremely complex algorithm for rendering a scene that takes into account all light sources and the affect that every light source has on every object in the scene. The result is the most realistic render, but it usually takes three to four times as long to complete. Since our deadline was short, and since each image would have to be reduced to 256 colors in the end (effectively eliminating any subtle tones that would be produced by radioicity) we decided to use the raytracing method.

The raytracing method essentially takes the image one pixel at a time and traces that pixel from the camera (or point of view) to the object and then to the light source. This allows for the correct calculation of shadows, reflections, refraction, bump and transparency maps. The process takes longer than Phong shading, but is much shorter than Raydioicity. Anti-aliasing can also be selected when the image is rendered so that the edges of objects get "smoothed" out. This adds substantial rendering time to the image, but the improvement in quality is worth it.

When the models were completed in every way and the proper camera angles were finalized, we began the process of rendering the final images. Strata StudioPro has a helpful feature of being able to set up what is called a "Rendering Que". This means that multiple renders can be saved or suspended and stored for later completion. In this way, we were able to suspend all the renders for an entire section at once and then set the computers to render a batch at a time over night. Because of this flexibility in the Strata software, we were able to make maximum use of our time by creating and editing by day and rendering at night.

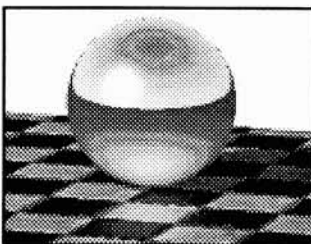
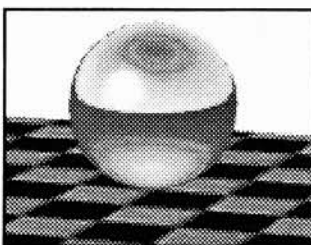
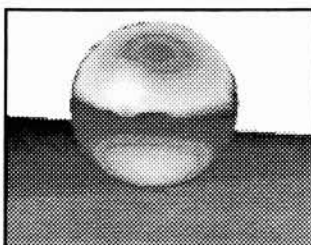
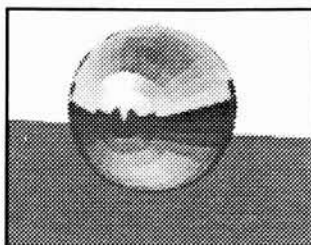
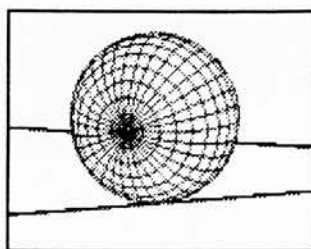


Figure 30

The computer uses various types of algorithms to draw or "render" a three-dimensional image. Here are five of the most common types of render treatments. From top to bottom: Hidden Line Removal, Flat Shading, Gouraud Shading, Phong Shading and Raytracing. Note the full use of texture, shadows and reflections in the Raytraced version. It is this type of rendering that lends itself to realistic 3-D images.

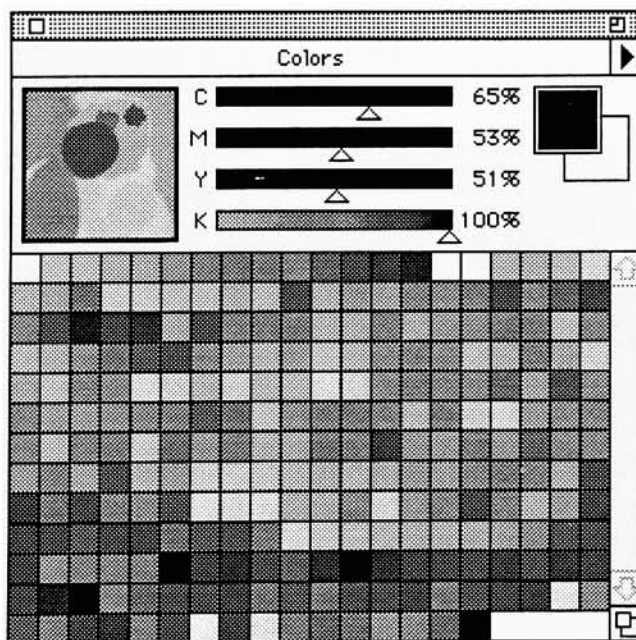
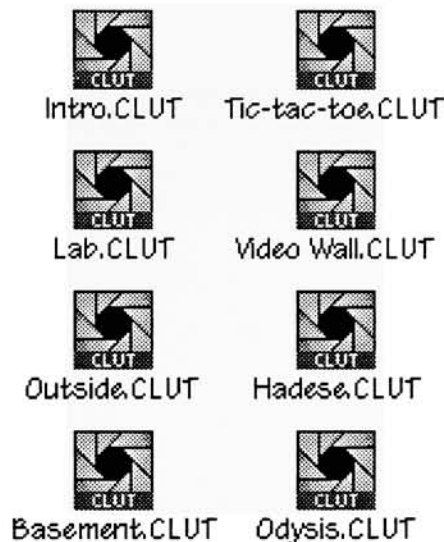


Figure 3P

At top are the eight Color Look Up Tables that were used in the creation of Live It! Each table is a palette of 256 custom colors that best describe the images for that area of the game. Below is the actual representation of one of those palettes.

Image Manipulation

Although Strata StudioPro is a high quality program, like any software application, there are certain things it does not do well. Because of this, it was necessary from time to time to manually touch up images that Strata had not completed to satisfaction. Often Strata had problems with extremely small texture details such as typography on control panels or display screens. In addition, rendering errors can occur if the light levels in the scene are extremely low, or if the resolution of the image is raised above the default of 72dpi.

In these cases we used Adobe Photoshop to go in and touch up the screens using the various tools that were available. After the corrections were made, the old file was saved over (to avoid confusion) and brought to the next phase of production. Some of the problems that we encountered with rendering have been addressed with the newest version of Strata StudioPro. However there will always be bugs that will hinder production.

Creating Custom Palettes (CLUTS)

From the very outset, the problems of memory and speed were a concern of ours. In order to reduce the time it took the computer to display and change the graphics on screen, we decided to convert all the images in the prototype from millions (32 bit) of colors to 256 or 8 bit color. If this were done the usual way, each image would have been converted to the 256 default colors of the Macintosh computer system. This leaves finely detailed images with many tonal variations looking rough, pixellated and crude. Due to this we decided to experiment with Color Look Up Tables or CLUTS.

CLUTS are a custom set of 256 colors that the user picks to best represent each image. If a particular image contained many blues and greens, then the CLUT for that graphic would reflect those particular colors. By eliminating all the colors that are not needed, more colors in the palette can be devoted to the subtle variations necessary to capture the gradations in that graphic. The CLUT can be saved in Adobe Photoshop and applied to many images.

Since there were eight distinct areas in the created prototype, eight individual palettes were created that best reflected the colors in those areas. By using these CLUTS, we achieved a smoother, overall look for the prototype by not relying on the 256 default colors present in the Macintosh system.

Recording QuickTime (Digitizing Video)

The process of recording the small video movies (known as QuickTime movies) actually began with story development. Based on the story, a script was written for each of the five actors that would appear in some form or another in the final version of *Live It!* These scripts would be used during the filming process to give the actors direction.

The set for filming was very simple, a blue screen (simply a piece of intense blue paper which is lit evenly) was hung in the background. This background, when lit properly creates an area that can be electronically “erased” by the computer and replaced with a different background such as an alien landscape or a spaceship interior. In this way it is possible to put characters into an environment that is impossible to build as an actual background. A Sony hand-held microphone and a Handy Cam were the only other pieces of equipment used during the filming process.

The actor/actress first had to rehearse several times before the actual filming was done. This allowed them to become familiar with the scripts and read the dialog correctly. Next we just let the video cameras run until we filmed enough good footage for use in the final movie.

After the filming was complete, we digitized the video into a Quadra 660AV using Video Fusion Recorder. During the recording process, no compression was used so as to maintain the best possible source file for the QuickTime movie. The capturing is accomplished by playing the video directly into the Audio/Video ports of the Quadra for capture. The software then digitizes the image and saves it in QuickTime format. QuickTime is a file format that was designed by Apple Computer for the process of recording and playing back video on screen.

Editing & Special Effects In QuickTime

After all the various video clips were digitized, the process of editing began using Adobe Premiere. Premiere is a tool for editing digitized video clips in a similar manner that a real film editor would use. Each clip is imported into the program, and from there the computer artist can select edits, change sounds, add special effects, and create final cuts.

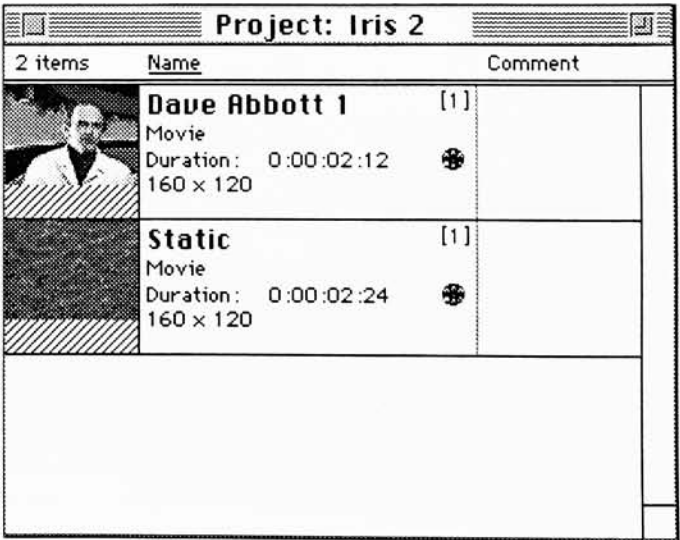
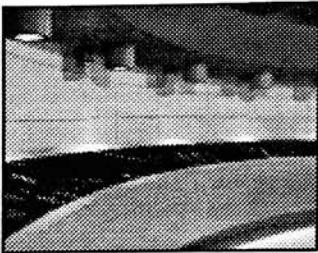


Figure 3Q
Adobe Premiere's Import Window. Each digitized clip is represented with a thumbnail view and information about the clip including its length, size (in pixels) and if it contains sound, video or both.



Figure 3R

Four images from the process of "blue-screening". The first (previous page) shows the actor with the simple blue background that can be ignored by the computer. Second is the 3-D backdrop created in Strata. Third is the Alpha Channel, or matte that is created after dropping out the background. Lastly is the composited image where the actor seems to be sitting in an imaginary setting.

By using Adobe Premiere, in and out points (a point set where each clip is to begin and end) of each clip were set in order to delete excess footage. These clips could then be arranged in the order which was appropriate to the movie. Because each movie began and ended with a shot of static, small PICT files of various shots of static were created in Photoshop and imported. These, combined with the sound effects created in SoundEdit Pro, created the illusion that each actor was calling in to Dr. Icona's home and was proceeded and ended with a kind of video transmission problem. In addition, some of the sounds required either amplification or manipulation, such as the voice of the alien Marcus Bone from the Hadese Region. These effects were created using both Sound Edit Pro and Audio Shop.

Because we wanted the actors to appear to be in various alien locations, simple three dimensional backgrounds were created in Strata StudioPro and saved as PICT files for later use as digital backdrops. These would then be imported, along with the source clips of the actor speaking his/her lines. Using a process called "blue screening" it is possible to replace the solid blue of the background with the imported 3-D background PICT and make it appear as if the actor is really in that location.

When the final edits and special effects sequences are placed in the movie, the clip is exported and a combined, final version is created. This working clip is then ready for palette conversion.

Optimization & Compression

After each movie was created, a single frame was exported from each. Next, these six individual frames from each movie were placed into a Photoshop file which contained the image of the video wall where the messages would be watched by the player. By combining the six frames and the image of the video wall in one PICT file, a CLUT was made. This Color Table consisted of the maximum number of possible colors continued in all six movies and the background image. This would ensure the best possible look for playback on all six clips.

In order to convert each movie from thousands of colors to the custom CLUT, each was exported out of Premiere as a filmstrip file and imported into Photoshop for conversion. Once done, it was exported out of Photoshop and back into Premiere for compression. The soundtrack was added once more (due to its loss when converted to a filmstrip) and the new, optimized movie was exported out of Premiere using the Cinepak compression method. The Cinepak algorithm provides the best playback for QuickTime movies on CD-ROM.

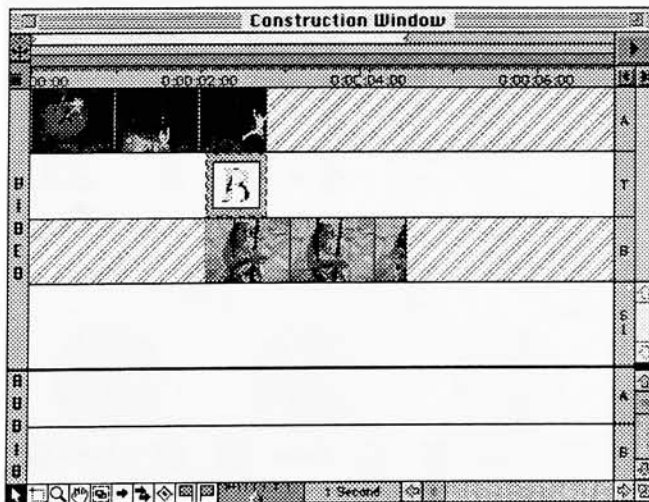


Figure 3S

Adobe Premiere's construction window. Shown is how two clips can be edited together. The first clip (in the top row) leads to a transition (in the middle row) and finally to the second clip (in third row) when the movie is made these two clips will combine to form a seamless transition.

Use of Sound

Sound adds a vital dimension to any interactive media. Through the use of sound, what was once dead screen time can become intriguing and mysterious. There were two main opportunities for the use of sound in *Live It!*: music and sound effects. Music was needed to provide both atmosphere and something to occupy the player during long transitions between movies. Sound effects are necessary to give the player audio feedback on such things as the push of a button, to signal danger, or to be able to listen to a character speak.

Music

Before we finalized the completed prototype, we recognized four main areas where music should occur; the introduction, Dr. Icona's lab, the exterior of the temple, and Dr. Icona's living quarters. Each needed to have its own distinct feel, yet the music style should be similar. We started looking for music through many different royalty free sound compact discs for possible sources. Several selections we found were usable so we digitized the tracks into the computer using SoundEdit Pro. These selections were used for Dr. Icona's lab, and her living quarters. The music for the introduction, was a piece from a Japanese animation trailer, but since this was for educational purposes, and since there was no way to learn who wrote the music, we decided to use the piece and give credit to just the title in the introduction.

For the section when the player journeys outside the temple, we asked Paul Maheux (Gedeon's father) to write a short melody or two that could be looped quite easily. This happened in early winter quarter. After we received the sheet music from Mr. Maheux, we asked our friend Patrick Byrnes if he would agree to perform the music so we could digitize it. He agreed and practiced the piece for several weeks prior to the night we digitized.

We plugged the synthesizer directly into a MediaVision ProAudio Spectrum 16 sound board installed in the Macintosh. This allowed Patrick to play the keyboard and have the notes instantly reflected into an audio file in SoundEdit Pro. Due to the nature of the software, we were able to go back and make minor corrections in the performance right on the computer. In addition, we deleted pauses in the music, and set the correct point for the music to loop before saving the music as an AIFF file. By setting the loop in this manner, Macromedia Director would be able to play the music over and over without the use of Lingo.

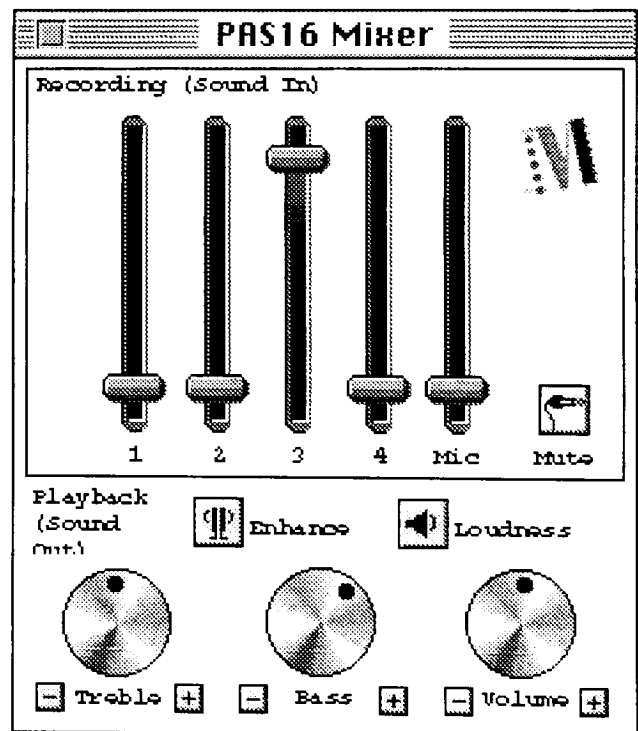


Figure 3S

The control panel for the software that controls the MediaVision sound board. Although this sound equipment would have allowed us to record in 16 bit mode, thereby giving clearer sound, we decided that the memory requirements would be too high.

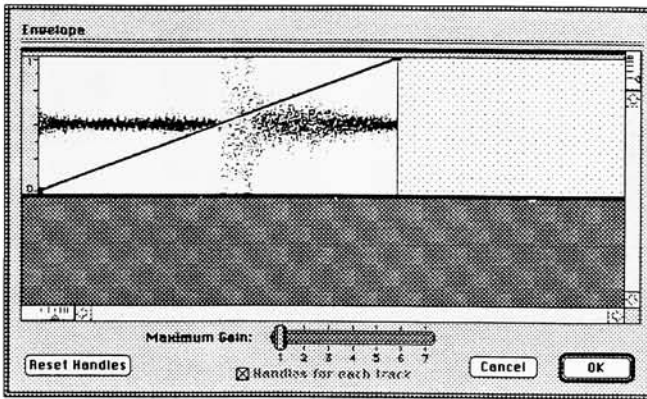


Figure 3T

The fade control from SoundEdit Pro. The sound is the wave-like graphic in the center. The fade "envelope" can be seen as the dark line running diagonally from bottom left to upper right. This refers to the speed of the fade. It is possible to adjust this envelope for many different effects.

Sound Effects

Because there were so many different sound effects that were needed for the prototype, we needed a great amount of source material to draw from. Knowing this we purchased several sound effects CD's, among them *A Zillion Sounds*, and two sound effects library collections. The majority of the sounds were button clicks or computer console sounds. Others included doors opening and closing, sounds for when the Log.I.C. Android moved, background sound effects (such as in the Hadese and Odysis sections), and voice overs.

By using SoundEdit Pro, we could change the pitch and length of a sound, add special effects to voices, or create looped sounds that would play multiple times until we designated them to stop. We also used Audioshop to create special sound effects since that program contains different effects filters such as various reverbs, and echoes. The voice of Marcus Bonne (the alien from the Hadese Region) was created in this manner.

SoundEdit Pro gives many different options when dealing with sounds. One of the most powerful is the option to fade a sound out or in. By creating what is known as a sound "envelope" the volume level can be adjusted within that envelope and the sound can be made to gradually fade to a volume of zero. If the sequence is reversed, then the sound fades in from zero to normal volume. By using this method, it makes transitions from one musical piece to another smoother for the listener. It also makes it possible to fade one sound down while at the same time fading another up. This is known as a cross fade and can also be helpful in making smooth transitions.

Each sound effect was saved with a name at 11kHz in audio AIFF format. This format is standard and is the format that is most easily imported into Macromedia Director. From there the sounds and music were brought into Director and placed into their proper positions in the movie scores.

Choosing Director

During the early stages of development, we knew that the main body of the game would have to be assembled into a shell that would allow us to use buttons, scripts, images, sounds and animations that the player would need to play the game. This shell would comprise the "guts" of the game as it were, and it was perhaps the most important part of the game development. There were several choices available to us. Among them were; Hypercard, Supercard, and Macromedia Director. Both of us were familiar with all three programs enough to use any of them for the task, but certain factors came into play as to why we chose Macromedia Director.

During our research with the Miller brothers (creators of *MYST*) we discovered that they had used Hypercard for the shell of their game. The primary reason they did this was for speed. Robyn told us that by using existing X commands (special scripts that allow unique functions) they were able to display graphics and move them on the screen very quickly. This, combined with the limited kinds of interactions in *MYST* led them to the decision of Hypercard.

Hypercard is excellent for a simple straight forward progression from screen to screen. It has the capability for displaying QuickTime and can use buttons and sounds freely. It lacks however, the ability to animate effectively, and build color graphics and icons directly in the program, such as Director does. In addition, we had just completed both animation and scripting courses in Lingo (Director's native language) and felt very comfortable with our knowledge of that particular program.

These factors, combined with our limited time to learn the complex scripts that would be required for Hypercard and SuperCard, led to our decision that Macromedia Director was the best choice for the task.

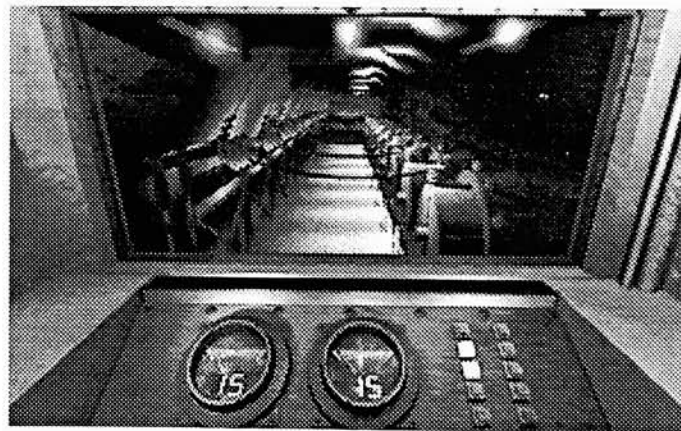
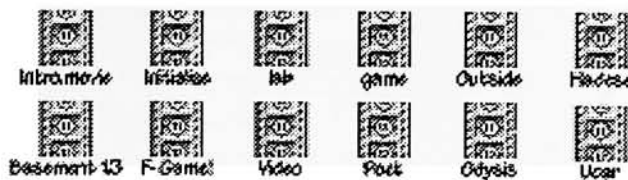


Figure 3U

MYST's "point and click" interface was suited well to Hypercard. However, things like an adaptable interface, complex animations, and smart text led us to believe Macromedia Director would be the best choice for Live It!



Using Director to Create the Game Structure

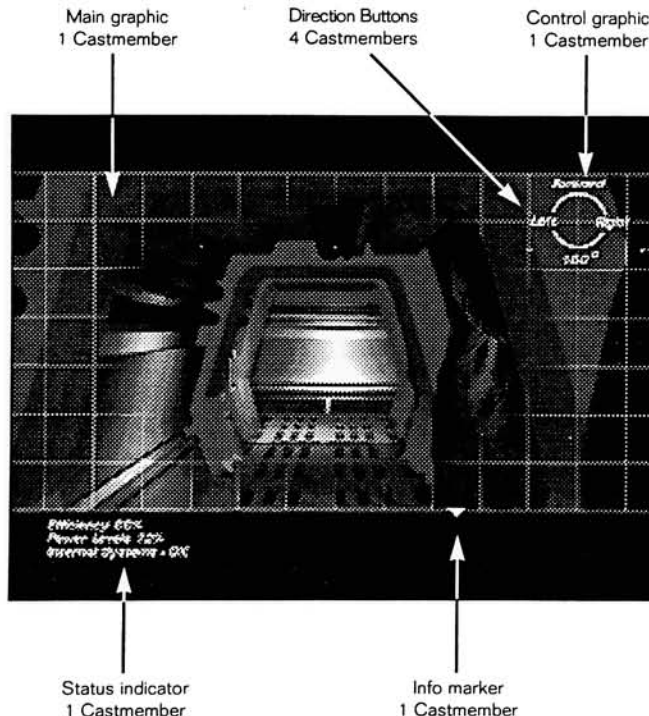
After the seeing the depth of the story and deciding what sections of the prototype were to be worked on, it became apparent that the game itself would be too large to conform to Director's 15 megabyte memory limit. It was decided from the start to set up a series of movies. Each would contain a different part of the game. How we divided up the sections was for the most part arbitrary, except when we knew we would have to switch palettes between them. Because we knew that the "Exterior" movie would use a separate palette, and it would be necessary to fade to black to shift palettes (see pages on Palettes in Director) we decided to make those two parts separate movies. Also, the larger any one movie became, the slower it would load into memory, and the slower game play would be. In the end, the completed prototype contained 14 separate Director movies in addition to 15 QuickTime movies. The sections probably could have been divided up farther still, thereby speeding up game play even more, but that challenge was not addressed.

Setting Up The Score

Director movies are controlled by the "Score". The score is a collection of cells or "frames" that act like a piece of film in a movie. Director allows the creation of hundreds of frames, and within each frame, the screen can have a maximum number of 24 cast members at any one time (Director version 3.1.3). At any one location in the prototype there were upwards of nine or more elements on the screen. The Director manual refers to these elements as "Cast members" because they take their place on the screen or "Stage". Cast members can be buttons, sounds, graphics, or text.

A typical frame in *Live It!* consisted of the main graphic (the scene the player was currently looking at) the directional control graphic, the four buttons that allowed the user to travel left, right, forward or 180°, and the three lines of text that was the status indicator. many screens however, contained many more elements including hidden buttons, animations, sounds and QuickTime movies.

When these frames were strung together with scripts that allowed the player to travel in those four directions, it appeared to the user that he/she was either turning or walking forward. In reality, the scripts were sending the player to multiple frames in different locations in the movie. But because of the transitions that were set up (a push left to turn right, and a push right to turn left) it appeared that the android was actually turning to face a new direction.



Getting Around In *Live It!*

In order for the player to walk around inside the game and visit different locations, it was necessary to devise a method of organizing the frames into a workable pattern. Each possible location in the game had four possible navigation routes. Since it was possible for the player to turn either left or right, go forward or flip around backwards, a frame had to be created depicting that action or view. Then from that point, four more had to be created until all the positions in that section were complete.

The method we used was to take the base starting position (letter A in the diagram below) and set up the appropriate frames for that view. Since position A in the basement was the interior of the elevator, only a forward and 180o view was necessary. When the player clicked the forward button, the playback head in Director would jump to the next frame location, in this case, position C-3. C-3 is forward one step and looking south. By using the letter of the position as the first co-ordinate and the number of the position as the second co-ordinate, each frame of the movie was designated. The scripts that took the player from one frame location to another took into account if he/she was turning left or right and used the appropriate transition. In this way, every location and every position in that location was taken into account and provided the player with a number of options for movement and control.

When the player moved to a position that was in a different Director movie, the command "Go to movie ____" was used and the current movie was closed and the next movie opened. In this way, it would seem like the player could continue on in any direction without limit. Most of the different Director movies were more than 500 frames in length. One was over 1500 frames. Because of the number of frames, and the amount of graphics that went into each section, sometimes it took the computer several minutes to load the environment into RAM. This caused lags that delayed the player's journey and slowed the game down. This issue was never resolved and is talked more about in the section "Unsolved Problems" on page 87.

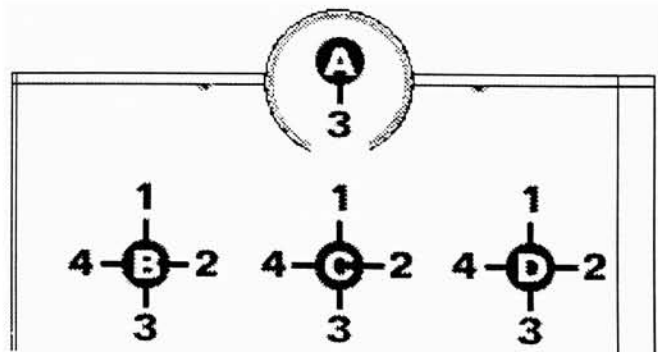
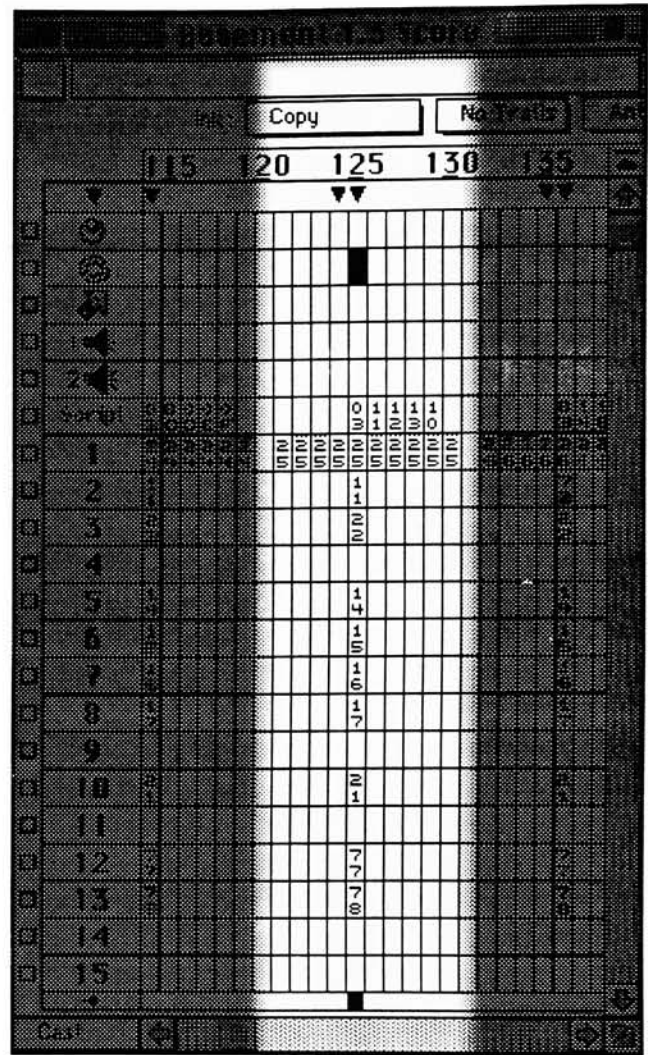


Figure 3V

The diagram at the top shows a typical game location in *Live It!* and the corresponding frames in Macromedia Director. Each location had a series of frames similar to this. The bottom diagram shows an example of how we laid out the different game locations and how each location was labeled.

Preparing Castmembers & Creating Palettes

Before the score could be correctly arranged and organized, the various castmembers had to be prepared to be imported. Since castmembers take many different forms (sounds, PICT files, buttons) each type of cast member had its own method of preparation.

Graphics, were produced mainly using Strata StudioPro (mentioned earlier) and then brought into Adobe Photoshop for optimization. The process of optimizing these individual PICT files was both a complicated and educational one. The standard Apple Macintosh computer is capable of displaying pictures in a number of different color ranges, or "color depths" (please refer to pg. 75). When pictures are displayed at this last bit depth, much more information must be pulled from the image for the computer to display it on the monitor, so the processing time of the computer is severely limited. This means that it takes (on average) the computer much longer to do things like process mouse clicks, load things into RAM, and change images on the screen. In addition, 24 bit images are usually three to four times larger in memory size than 8-bit, or 256 color images. Due to the fact that we needed to load so many images into each section of the game, and then provide transitions like push left and push right, it was decided to use 8 bit images.

When importing a PICT as a cast member, that PICT file has a color palette attached. Director will ask whether you want to remap the colors (to the system palette) or install the custom color palette. If you remap the palette, the color of the image will shift. So it is important to unify all the palettes of all the PICT images in that section before importing them into Director.

The process for converting these images to a single unified palette, is outlined earlier in this chapter (see CLUTS). Since these adaptive palettes, or CLUTS are saved with each image, Macromedia Director is capable of importing them along with the image. These CLUTS then become a castmember and can be manipulated if need be. Since only one palette can be on the screen at any one time, it was necessary to "hide" the transitions between palettes so that the player would not see a noticeable shift in color. We hid these shifts in palettes by using the "fade to black" technique. This simply involves dimming the screen to total black, then while no color is on the monitor, switching the color set to the new palette and fading back up to white. In this manner, the player is fooled into thinking there are thousands of colors instead of the 256 being displayed at that moment.

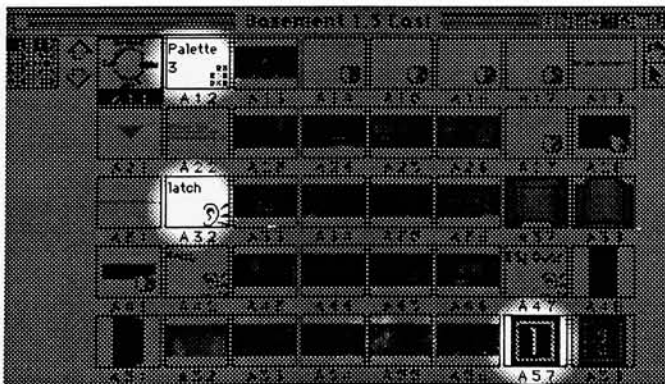


Figure 3W

A typical Cast window from Live It! The highlighted areas show a palette (at top) and sound (2nd) and a typical graphic, in this case a button. Each element occupies a space in the window and each movie can contain over 500 castmembers.

Scripting & Variables

Because the very nature of the game design was intended to give the player as much choice as possible, it was necessary to develop scripts that would allow the player to affect the environment, and in doing so, change the course of the game. At certain points in the adventure, the player would be called upon to solve a puzzle or riddle that would, when solved, give him/her access to additional choices or information.

One such example of this type of scripting can be seen at the computer console in the upper level of the temple. When the player approaches the computer he/she can access several different levels of information. There is one level however, that the player does not have immediate access to. This area is the personal logs of Dr. Icona. These logs are protected by a security access code that the player must decipher before he/she can proceed. The clue to solve the puzzle can be found outside the temple on one of the eight columns. Once the player has discovered the way to defeat the security code protection, the computer recognizes this, and from that point on, the computer will no longer request the player to solve the code. The variables were set up such that once the puzzle was solved, it would not have to be solved again.

Global Variables

Because solving the security code involves the player moving from one Director movie to another, and back again, a way had to be found to carry information from one movie to another. That way was global variables. Global variables are Director's way of assigning a value to an alphanumeric string of either numbers or letters. This value can then be carried across movies by declaring them to be "Global Variables." As the name indicates, global variables can be read into any Director movie that specifies them. In this way, a global variable was set up in the security code movie that would check to see if the value was either 0 or 1. If the value of the global variable was set to 0 (what it was set to when the player starts the game) then he/she has not solved the security code and must attempt to do so. Once they have solved the code, a script automatically adds 1 to the variable and therefore the new value is now 1. Because the value from that point on is 1, and it is that value in all other Director movies, the player can leave that movie and come back only to find he/she does not have to solve the code puzzle again. Several of the puzzle problems in *Live It!* were dealt with in this manner.

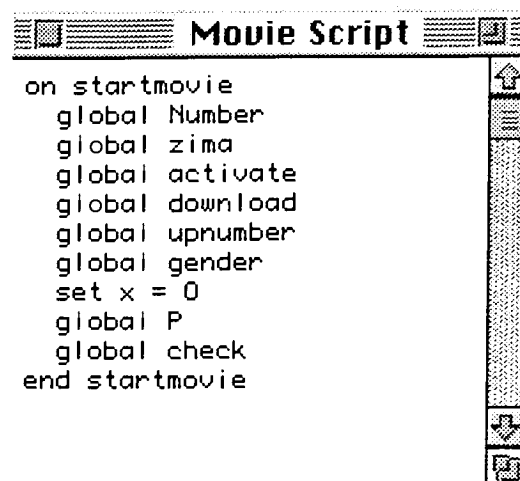


Figure 3X

The movie script from the security code movie. In the script, you can see the script declare seven global variables. The last, "check" is the variable that determines if the player must solve the code every time or not. All global variables start out with a default value of 0.

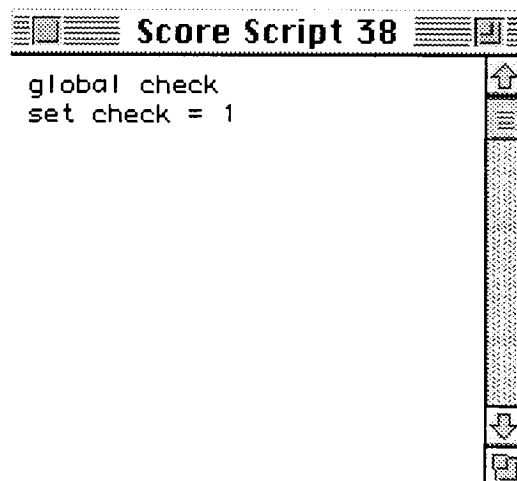


Figure 3Y

This script from the score of the security code movie, adds 1 to the global variable "check". Check then is greater than 0 and the player never has to solve the security code again until the game is quit. Director will remember this value all the time it is active.

Advanced Scripting

There was one part, in particular, that demanded advanced scripting. In the basement level of the temple, the player would come up against the "Equality" puzzle. This puzzle was designed almost like a three-dimensional tic-tac-toe, except that the object wasn't to get three in a row, but rather to reach a stalemate. This went along with the concept of the metaphors of the puzzle, but ended up extremely difficult to make work.

The puzzle was designed so that the player could click on one of nine cylindrical buttons and have (depending upon a click or a double-click) either a sphere or a cone appear. These spheres and cones would act like the "X" and "O"'s in tic-tac-toe. Then depending if the appropriate criterion was met, the player would either have to start over, or gain a point.

Because we were limited to 24 channels or objects on the screen at any one time, scripting had to be developed to make the most efficient use of channels as possible. The channels would flip back and forth between the sphere cast member and the cone cast member when the player pressed the appropriate button. Next, the script would continuously check to see if all nine spaces were lit up with either cones or spheres. If all nine were not lit up, then the script knew that a stalemate was not yet reached and the player could continue. When it was determined that all nine spaces were lit up, the scripting went through a number of pattern checks to see if any of the possible eight ways of winning was achieved. If the pattern indicated a winner, the game would reset and the player would have to start over. If the pattern was not one of the eight winning patterns, then the script knew that a draw must have been met and the player had a point added onto a variable. When that variable was greater than three, a global variable was set that allowed the player to make a change in the upper level of the lab and the player had won.

A full version of the actual script written for this puzzle is available in appendix IV (advanced scripting).

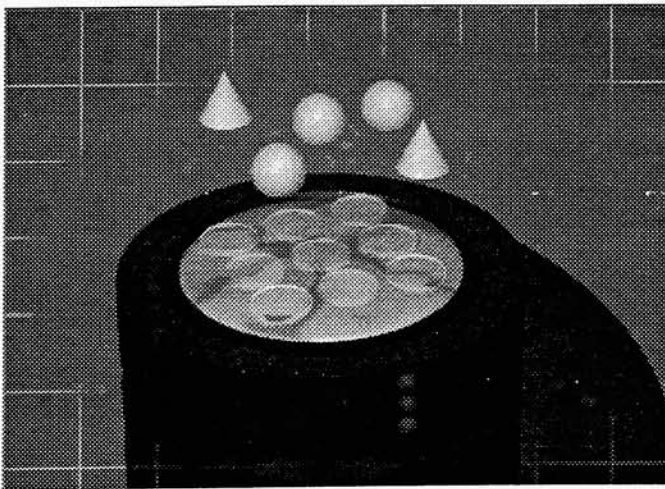


Figure 3Z

The "equality" puzzle in the basement level that required some of the most complex scripting in the entire prototype.

Beta Testing

In order to prepare the prototype for the thesis exhibition, we needed to test what we had done with a sample of people prior to its completion. We were able to sign up students from some of the classes of our thesis committee professors. The testing was carried out during a three day period two weeks prior the thesis show. Students signed up during their classes with their professor to test *Live It!* at a specific time, and they came to the computer graphics design lab in pairs. Because they only had a limited amount of time, we asked that they test the game in pairs in order to better grasp the game play in a shorter amount of time.

The prototype was set up and ready while both of us monitored them playing the game. In this way, we were able to take notes on where in the game they became stuck or confused, and at the same time we tried not to give away too much information in order to give them a fair attempt. Notes were taken on such things as interface design problems, ability to solve puzzles, spelling mistakes, etc. Afterwards, the testers were provided with a questionnaire to fill out to provide us feedback. These questionnaires can be found in Appendix V (beta test results). We then went on to use these results to make minor improvements in the prototype before its final completion at the thesis show.

Improvements

At the end of each day, we combined the information we gathered during the testing, and applied that information in order to make changes and corrections in the prototype. By doing this, we tried to avoid the same kinds of comments the following day. Besides the usual corrections in spelling and the occasional cast member that has moved, the comment made the most was that the testers didn't always understand how they were moving about the rooms from place to place. This comment came up several times and we decided to try and add something to correct this problem.

What we added was a mapping function that would allow the android to download a map of all the rooms in the temple. With this map active, the player would always be able to see his/her position relative to the rest of the temple. In theory, this was a good idea, but several problems came up that are discussed in the "Unsolved Problems" section to follow. Beta testing helped us correct some of the problems we couldn't see before because we had been working on the project for so long.

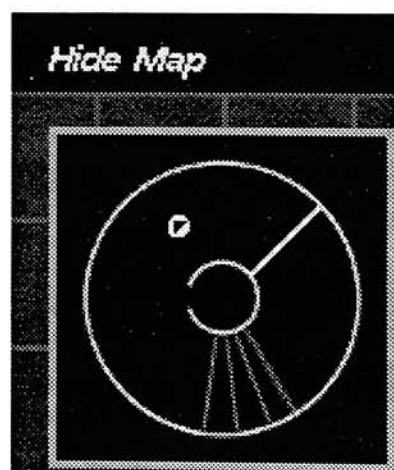


Figure 4A

The infamous map option that we created in response to testers comments that it was difficult to tell where he/she was. Because we added this option at the last minute, numerous problems arose in scripting that could not be corrected before the final version was complete.

Unsolved Problems

In every thesis there will always be unsolved problems and approaches that you wish you could have taken. We tried from the very beginning to put as much into the prototype as possible, but time restraints made some ideas impossible. A great effort was made from the very beginning to correct as much as possible as we went along, and for the most part, many of these problems were taken care of. Some however, were not.

One of the problems we never really had time to address was running speed. Since we constructed the prototype on relatively fast computers, when it was played on slower systems, the playback speed for such things as animations and sounds didn't match. This was especially true for the introduction animation where the asteroid was falling through a star field to the planet's surface. This sequence was painfully slow on anything but a Quadra with a great amount of RAM. There might have been ways to optimize this sequence if given time.

Another was general running speed of the entire prototype. Once again, on fast computers the game was fine, but going to a slower system with less RAM slowed playing dramatically. This was especially true when having to go from one movie to another. Load times were long and player interest would wane. We feel that the use of Director 4.0 would have solved some of these types of problems, but again due to time and software constraints, these options were not available.

As mentioned on the previous page, we added a mapping system to the interface just a few days prior to the show. By using this map, the player can download the information and identify where they are. The problem here was in the changing variables from movie to movie. Because the map was added as an afterthought, not all the scripting locations for variables and handlers were taken into consideration. Therefore, the map will show up only after returning from other movies. Because of this, the player experiences program error during the usage of the mapping function.

Other minor problems such as occasional palette shifts or sound problems also exist. Even though we were not able to correct all of these problems, we feel that the project in itself was a tremendous learning experience. One cannot possibly anticipate all the problems that would be encountered, and dealing with them is part of the learning experience.

Conclusion by Talos S. M. Tsui

Working on this thesis increased my ability to work in different applications, especially in Strata StudioPro and Macromedia Director. The knowledge I have acquired on the issues of trends and talking to professional people working on actual products has been tremendous, such as Chuck Carter and Robyn Miller.

From the interview with Robyn Miller when *MYST* was just released, to the huge success of *MYST* five months later, I have observed the importance of a successful game design. I can see the potential of *Live It!* in storyline branching, although it is only a prototype, I know we accomplished something that no one else has in the interactive market.

It is hard to say when work on the thesis stopped before the thesis show since it was such a big project. We always wanted to do more, add more into the game. We discussed with our thesis committee over and over again on this issue. We managed to keep on track toward reaching the goal of our thesis. And it could only be done by meeting with the thesis committee, and getting feedback by showing the game to other people who were not familiar with *Live It!*.

Finally, I think *Live It!*, has proven our abilities in using different software in different areas, such as sound effects, video, scripting and 3-D modeling, and working with Gedeon together as a team. *Live It!* shows the potential of what a real non-linear game looks like, as well as a different way of story telling with social issues included within the game.

This thesis report is a document we wrote together. We want to give a balance of text and graphics, which showcases how we created *Live It!*, and to try and hold the interest of the reader on this report with a touch of the design skills we carried from our undergraduate program at RIT.

Conclusion by Gedeon Maheux

Creating a fictitious world from scratch is a monumental task. Every detail, from what a character wears to how she/he speaks, has to be considered. This was probably the *most* challenging part of *Live It!*. In one way or another, both of us had the technical skills, to complete the graphics and computer-related parts of the prototype. It took a completely different type of skill, however, to weave a world, thought up entirely from our own minds.

It was this aspect of the project that made it so satisfying to work on. Knowing that the ideas, concepts, locations, objects, characters and dialog that you create become part of an environment that someone else will spend so much playing time in, is extremely gratifying. Creatively, the graphics and three-dimensional modeling were exciting to work on as well, because we got to see our ideas come to "life" and take form. We created sounds for things that didn't exist. And did the same for people and aliens that no one had ever met. Having this kind of creative license is addictive to say the least. It was a joy to sit down in front of the computer and create. This was another aspect that helped to make the thesis such a learning experience.

Having free range to create anything, and plug it into a universe that is fictitious is very challenging. This is especially true when you only have twenty weeks to complete the assignment. Due to factors such as time, certain things had to be left incompleated. The Village of Ucar is a classic example of something that was well grounded in concept as well as visual design. We had envisioned it as a mythic place that the player would roam and learn about alien culture, all the while soaking up the wondrous visuals. Because of our time constrains however, Ucar had to be left "on the drawing board".

The locations such as Ucar and to some degree the Odysis Mining Facility were the source of both disappointment and satisfaction. Knowing that the ideas for these places were complete, but yet somehow they did not have form was frustrating. The concept for the game was always the strong point, the "tour-de-force", but we knew from the very beginning we could not possibly give the entire game life. In knowing that, we set out to do the best we could with the time we had. Thanks to tremendous contributions from our professors and our friends, we were able to complete, what I feel, is a strong and definite statement about what the Electronic Media Design Masters of Fine Arts Program is all about. Thank you.

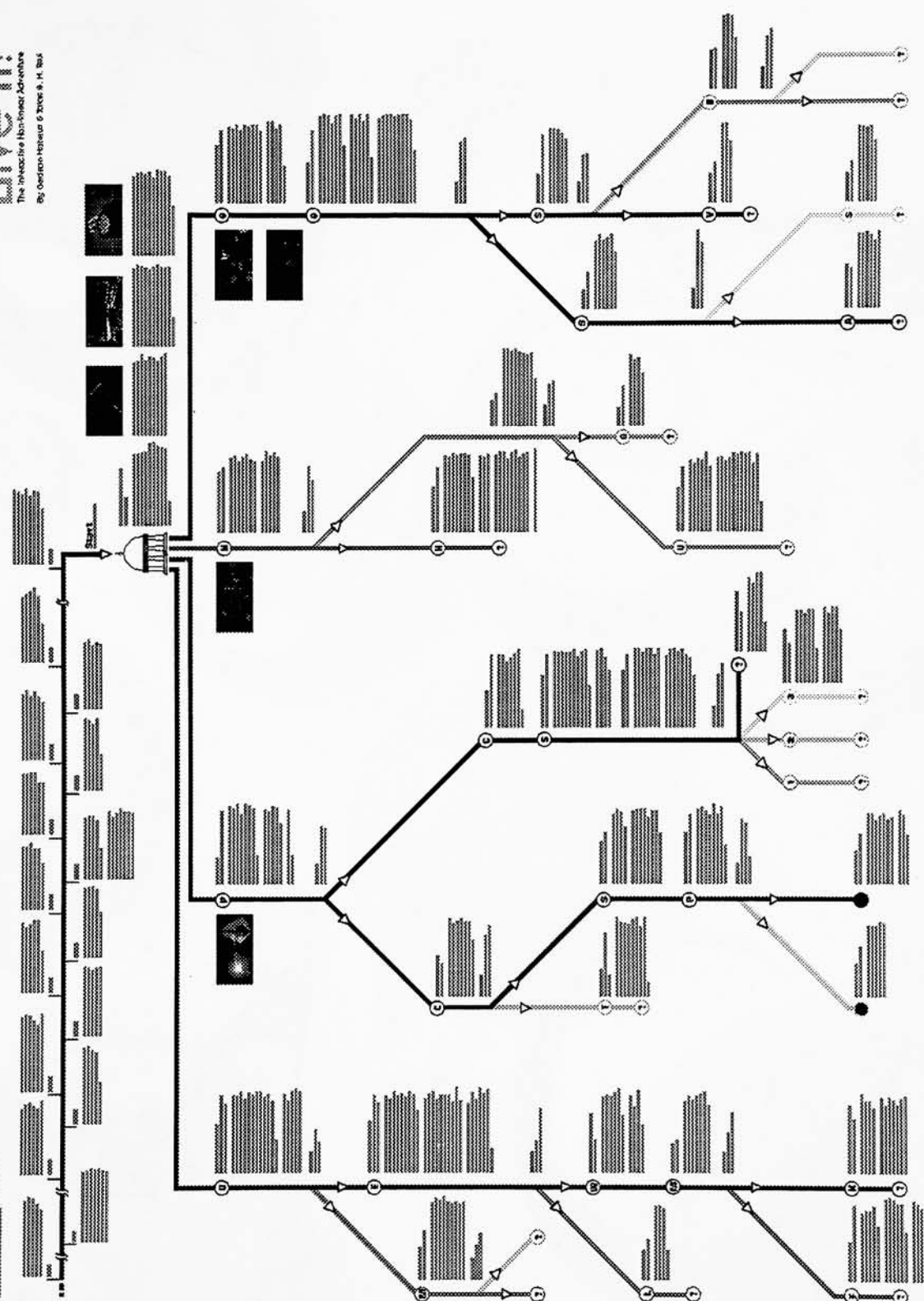
Sketches

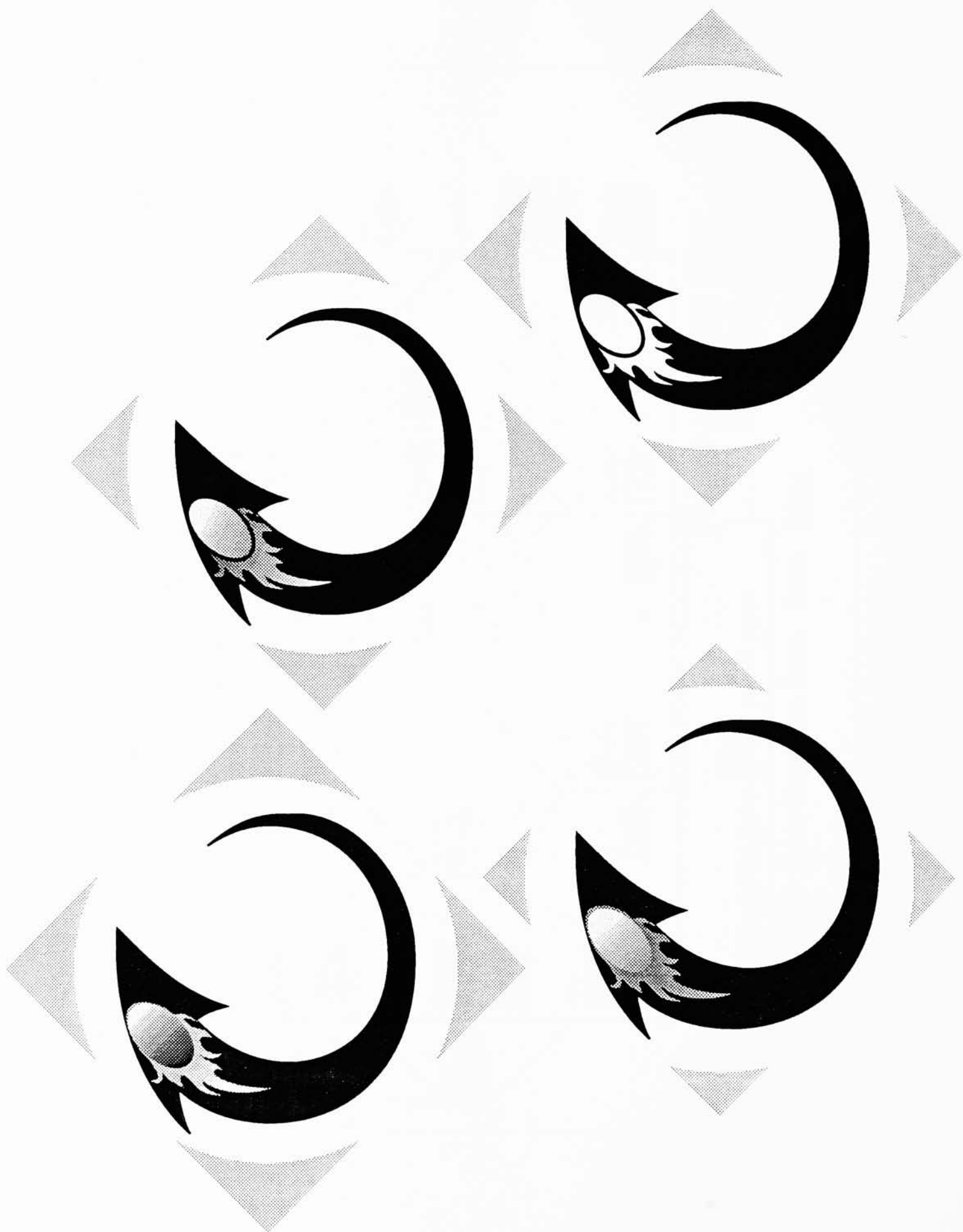
The following appendix are copies of the original production sketches that were created for *Live It!*.

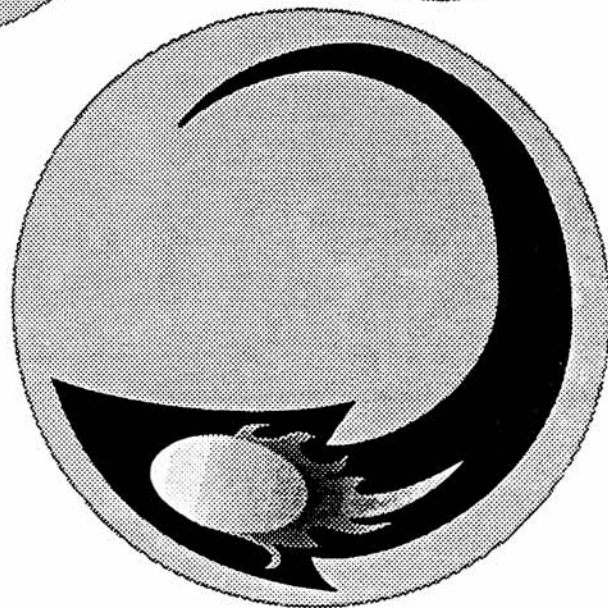
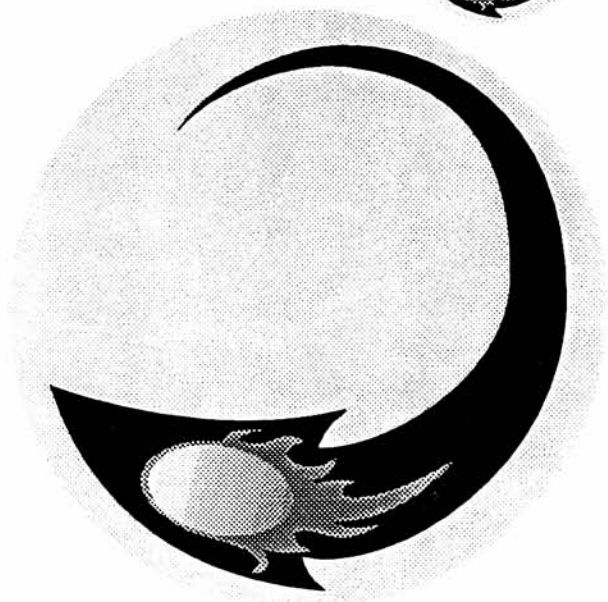
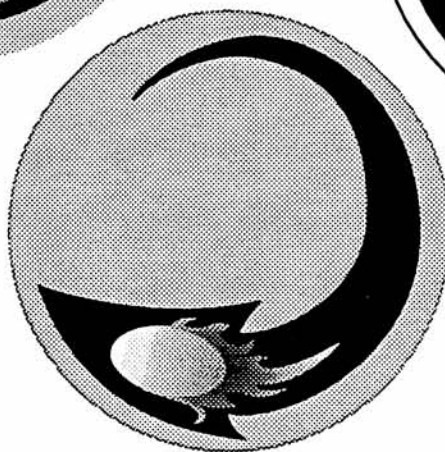
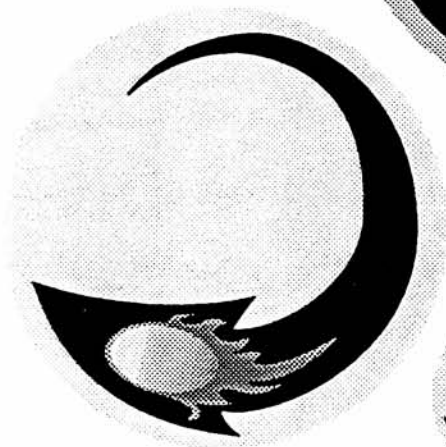
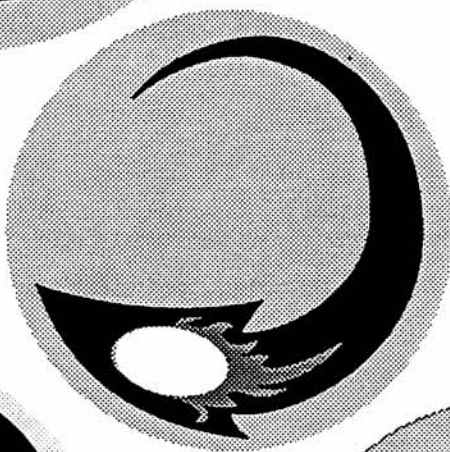
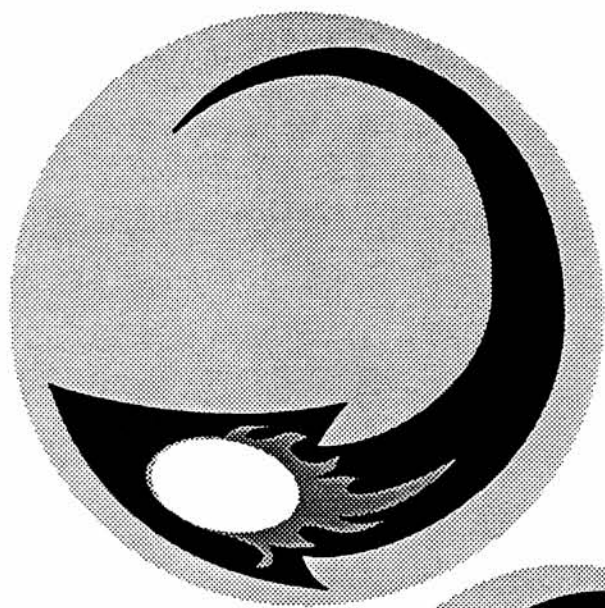
Live It!

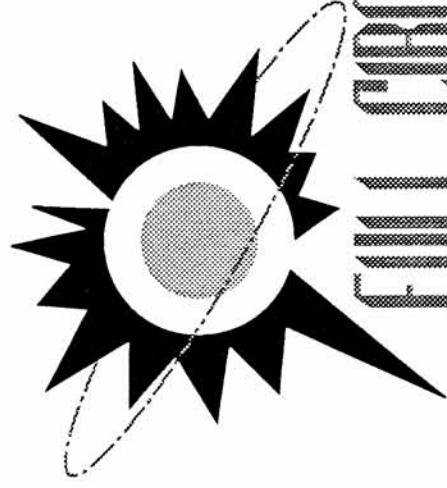
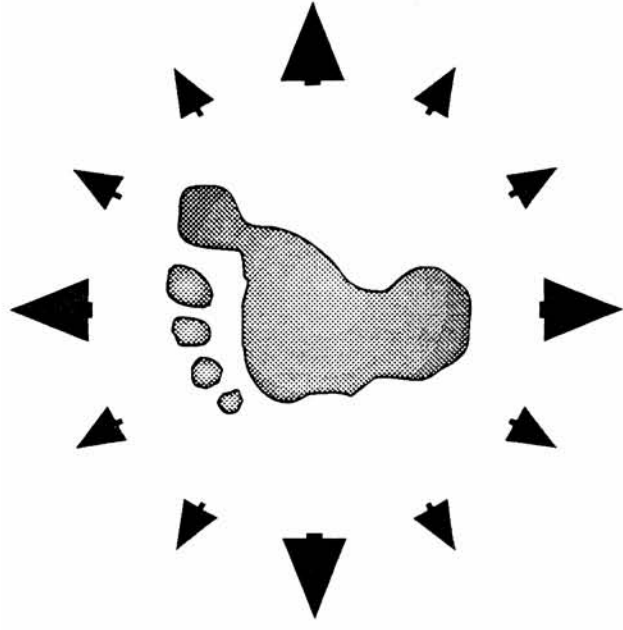
The Interactive Non-Snark Adventure
By Gordon Hales & Steve A. H. H.

Live It! Microcog Timeline

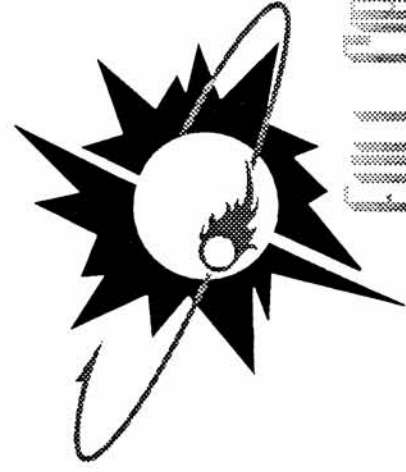




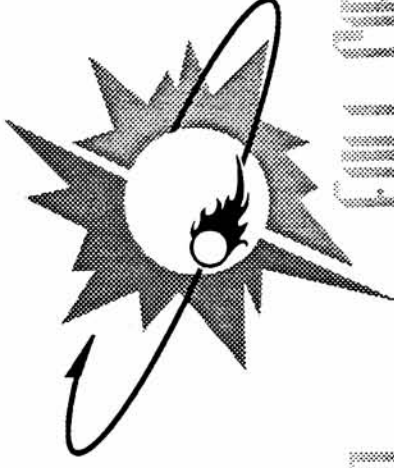




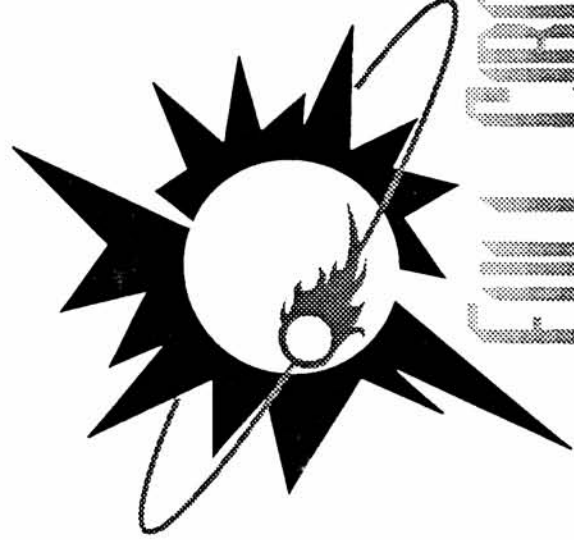
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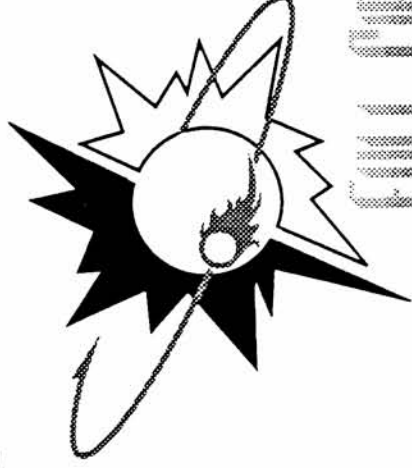
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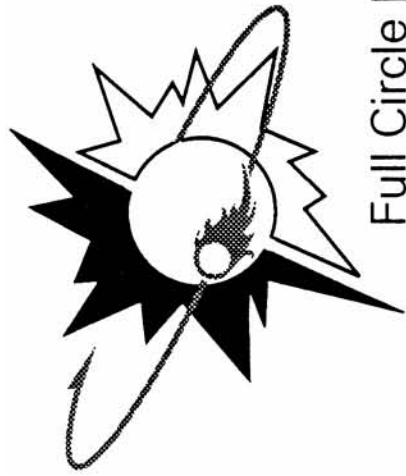
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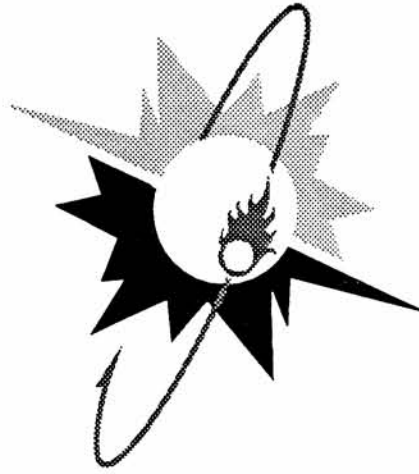
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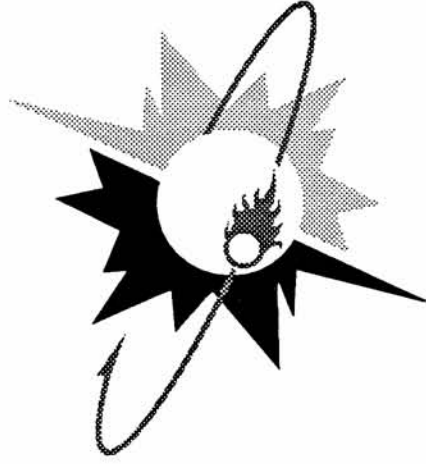
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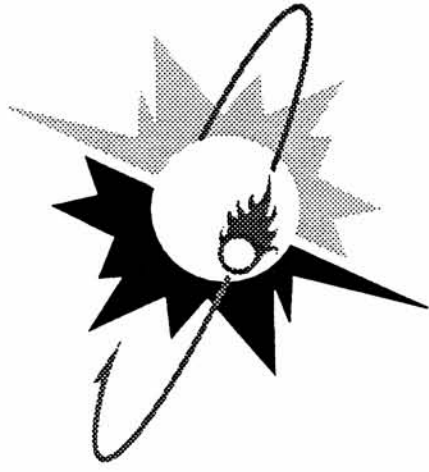
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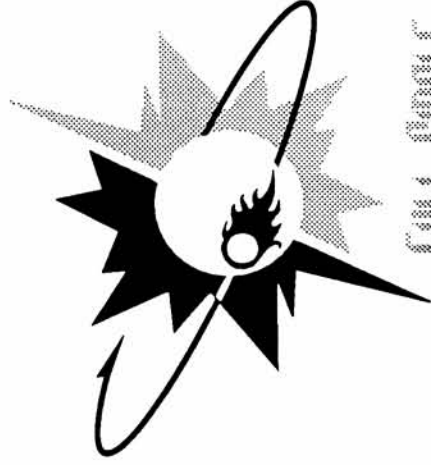
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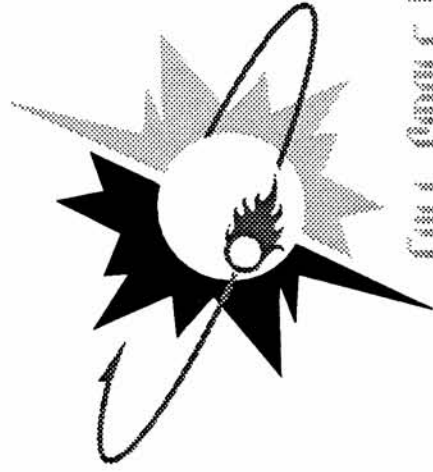
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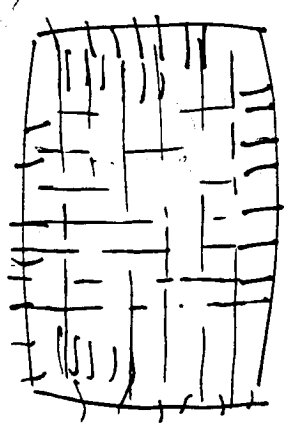
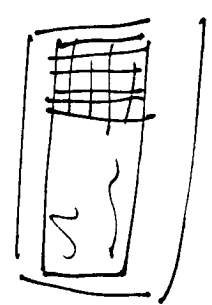
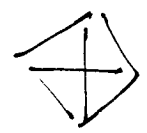
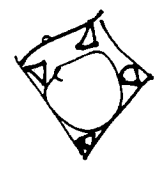
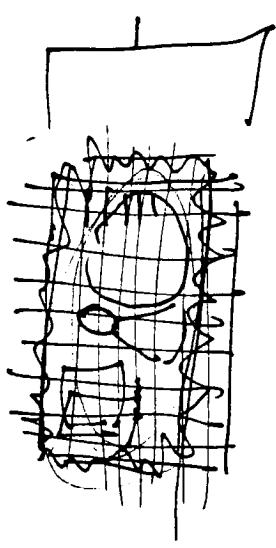
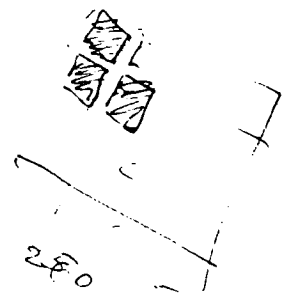
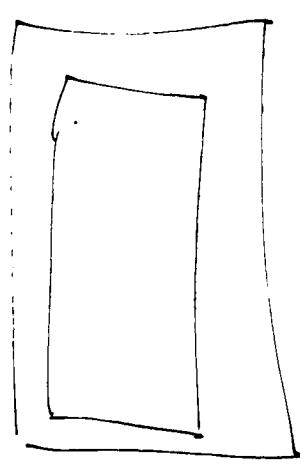
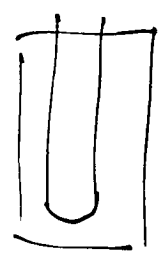
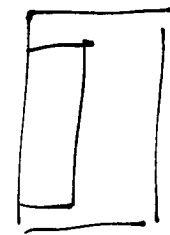
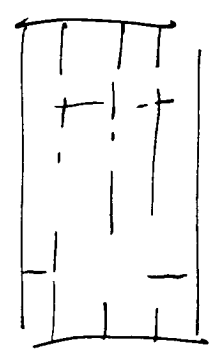
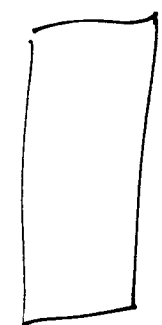
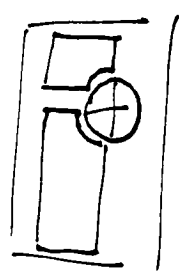
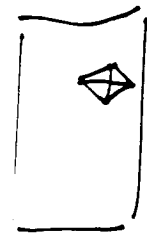
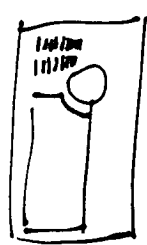
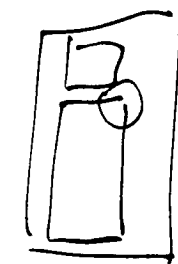
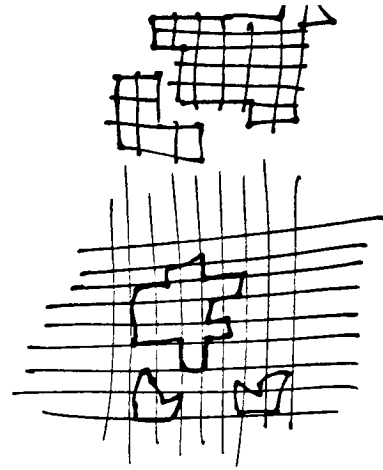
Full Circle Design



Full Circle Design



Full Circle Design



As

What is the visual interference level of the interface?



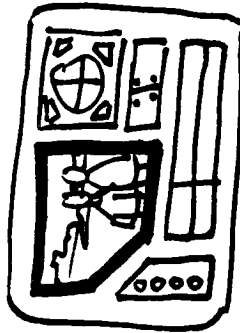
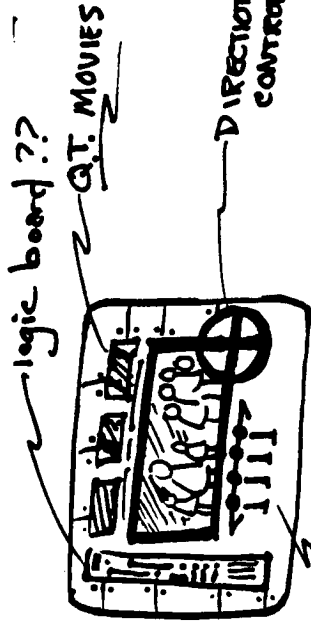
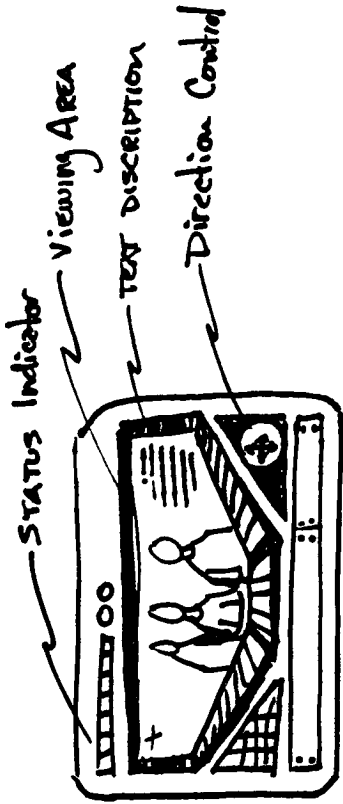
INTERFACE

Always NEEDED

- Viewing Area
- DIRECTIONAL CONTROL
- STATUS INDICATOR (MALE, FEMALE, ROBOT)
- QUICKTIME MOVIES
- INVENTORY LIST

Needed ONCE

- GENDER CONTROL



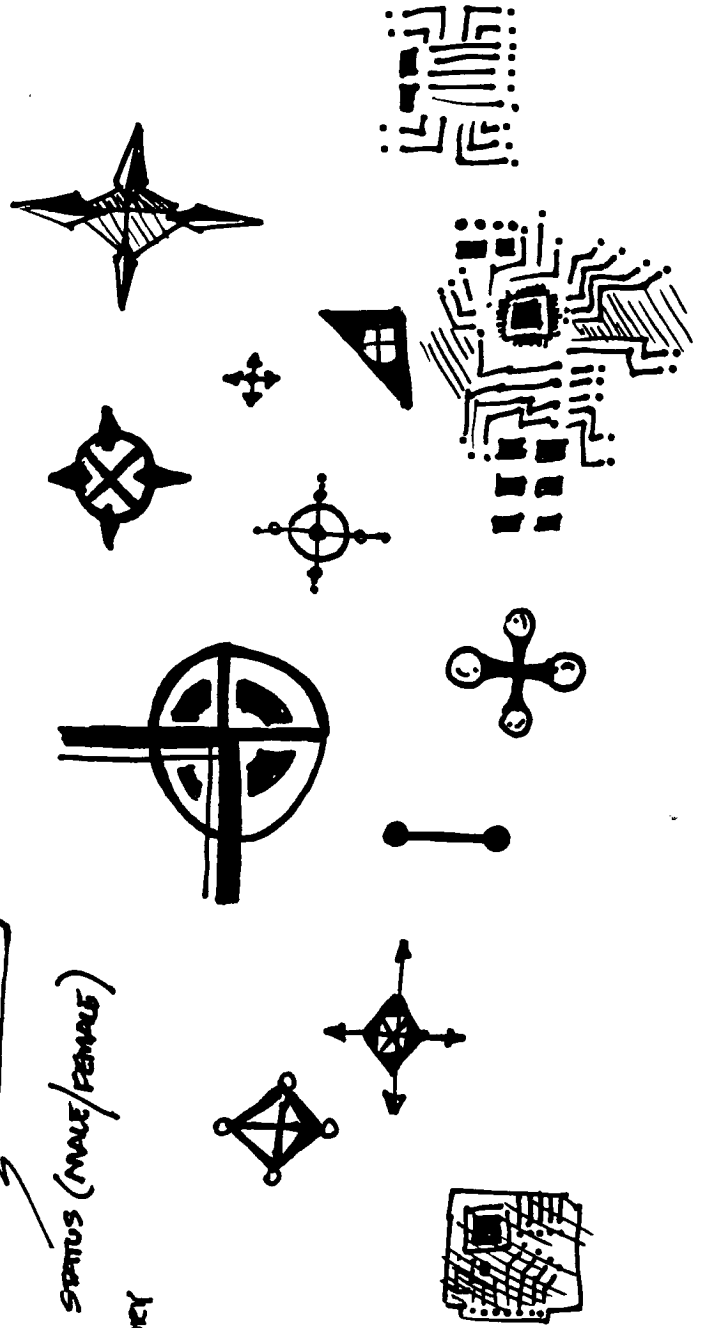
DIRECTIONAL CONTROL

STATUS (MALE/FEMALE)

STATUS / INVENTORY

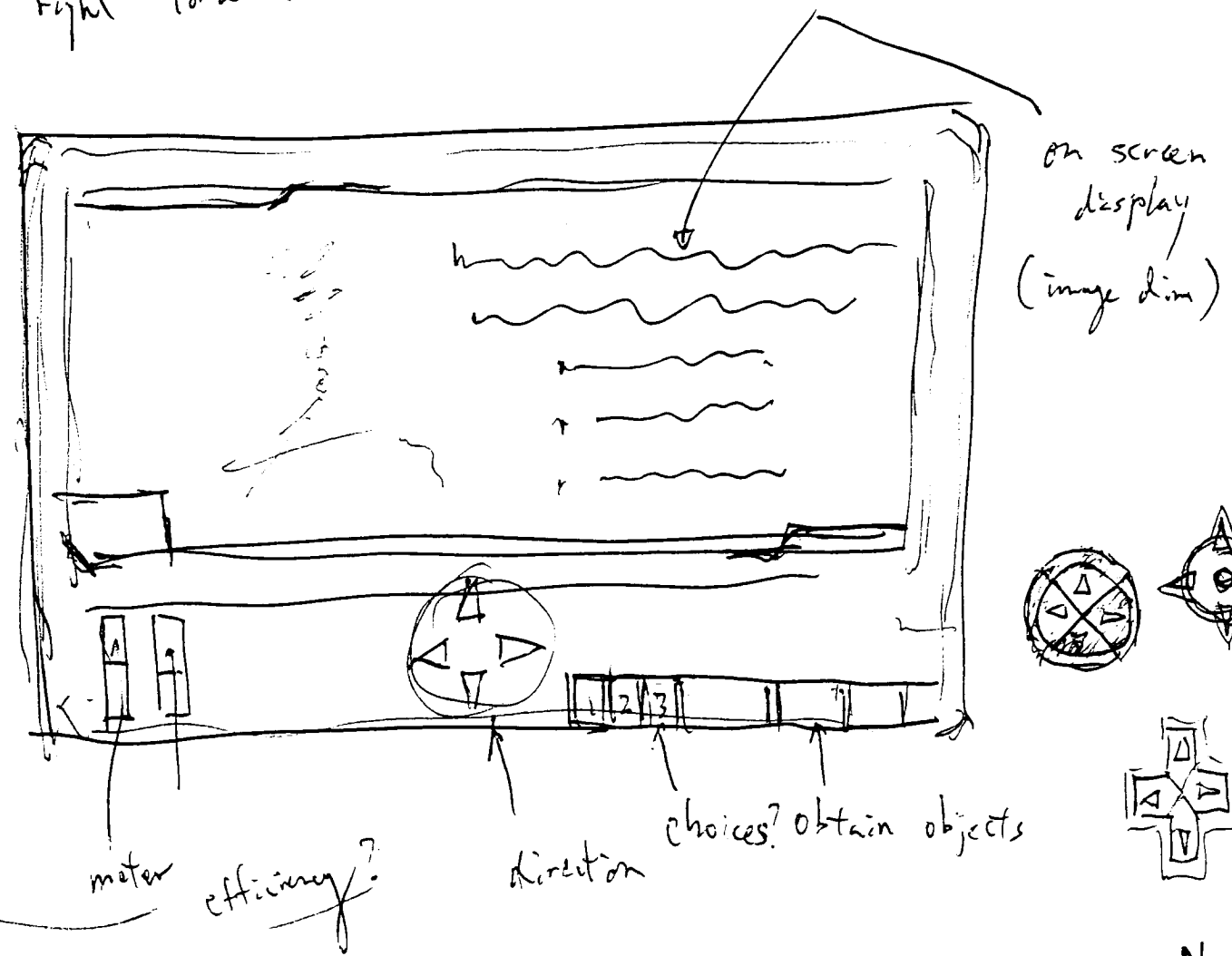


DIRECTIONAL



Interface Design

left right forward backward

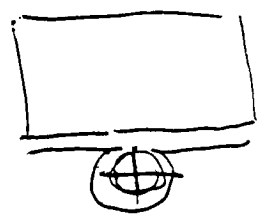


3 different interface for each gender

Robot = more circuit board surround the display

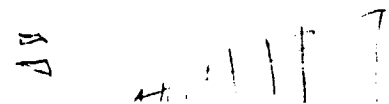
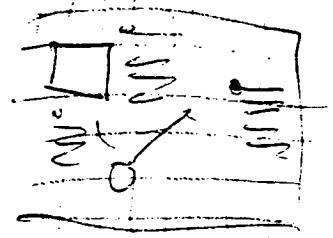
Male = Color, more sharp corners

Female = Color difference, more round corners

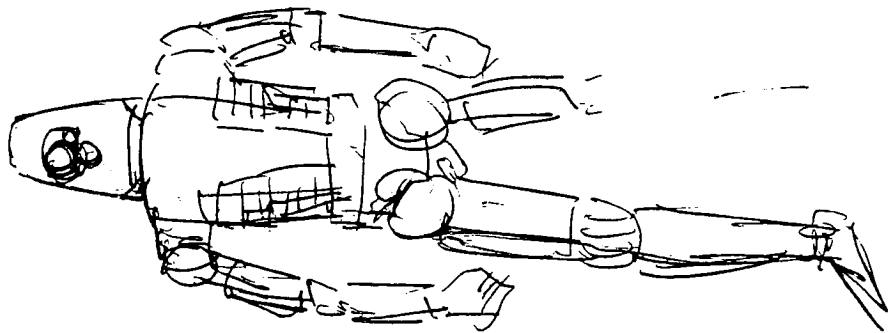
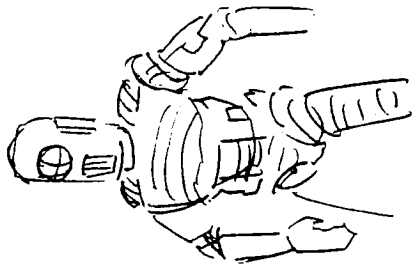
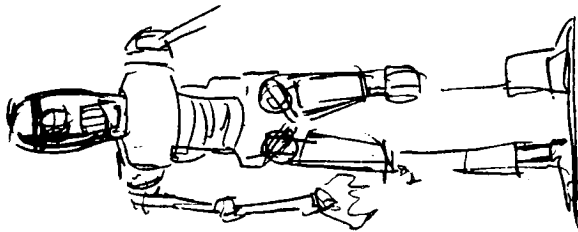
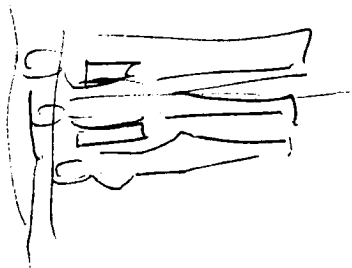


Apple:
Development fund? ★

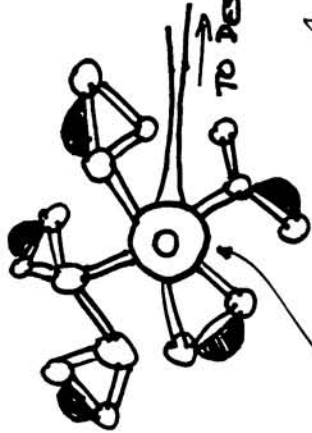
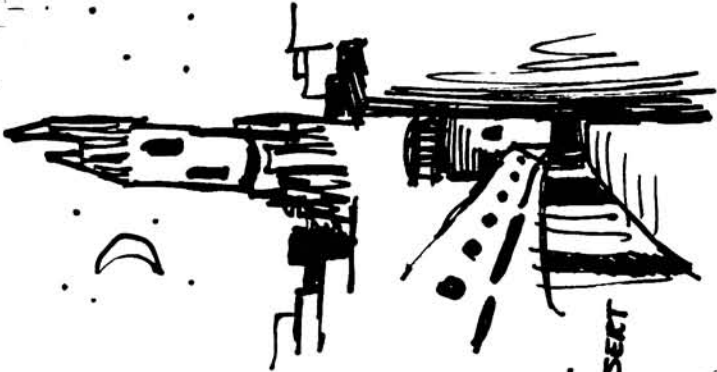
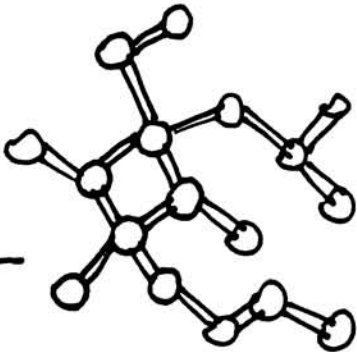
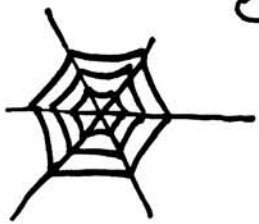




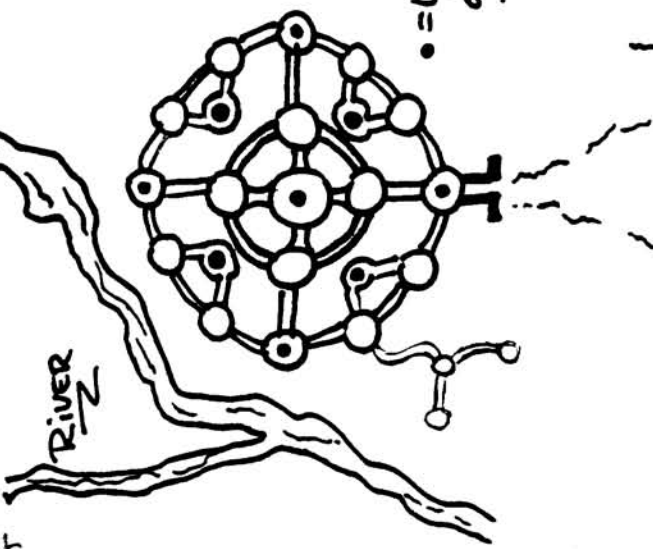
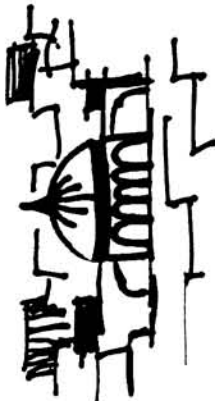
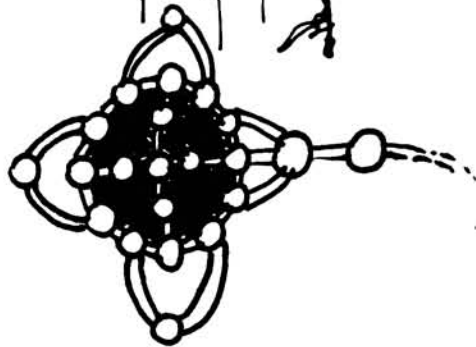
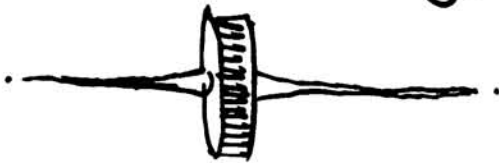
Robot



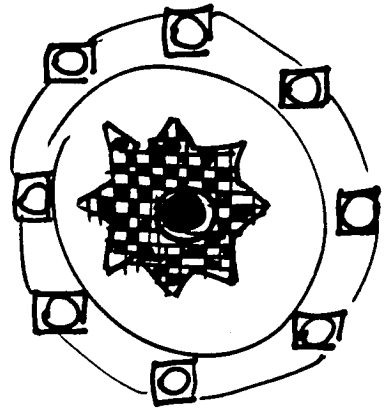
THE City of Knowledge



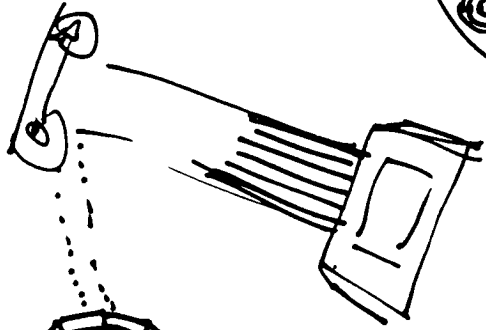
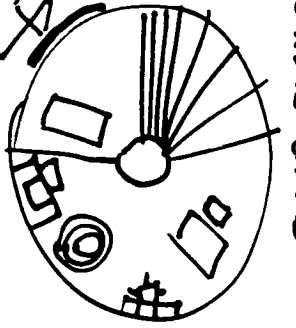
Plaza



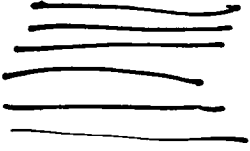
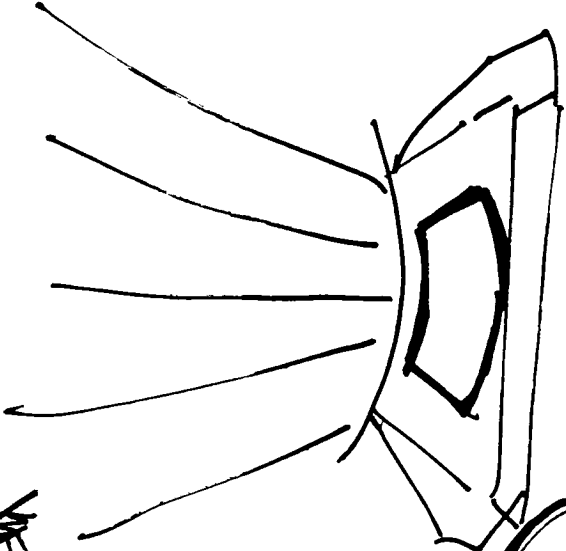
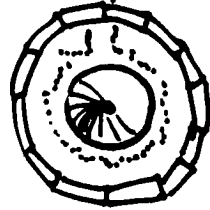
= Location of clues



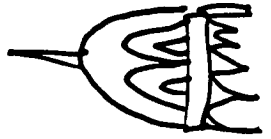
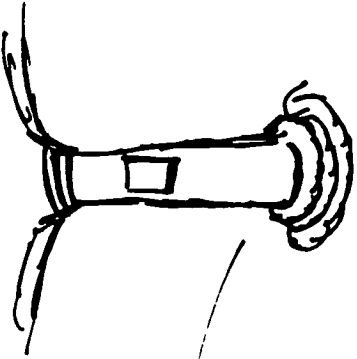
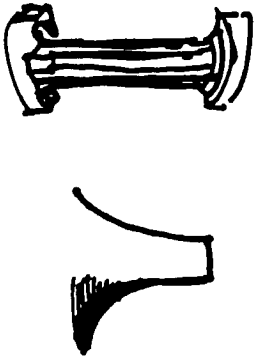
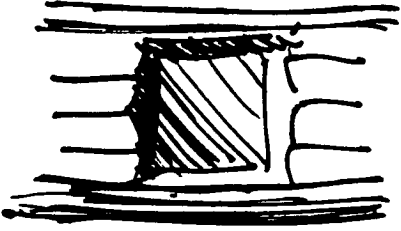
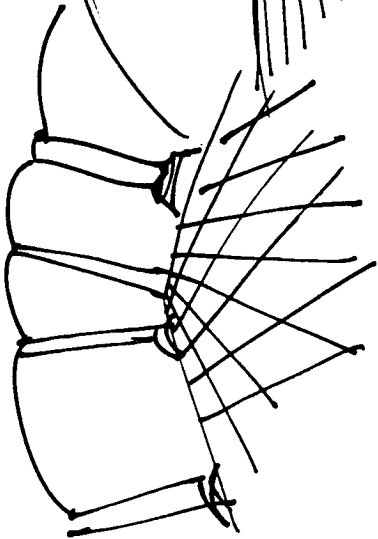
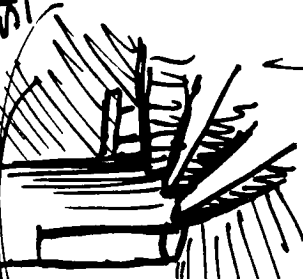
FLOOR PLAN OF LAB



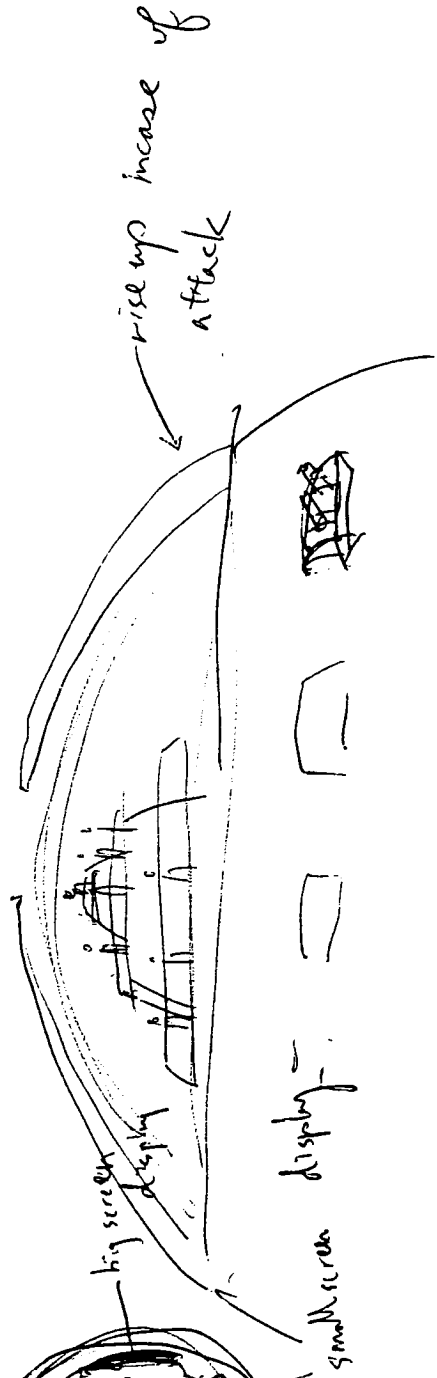
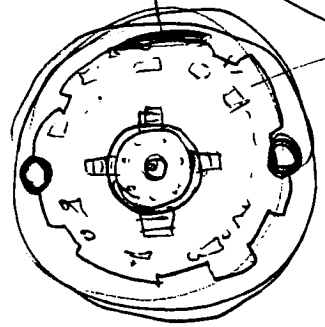
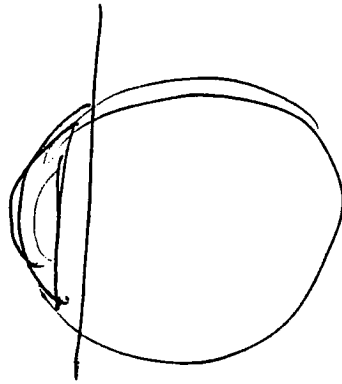
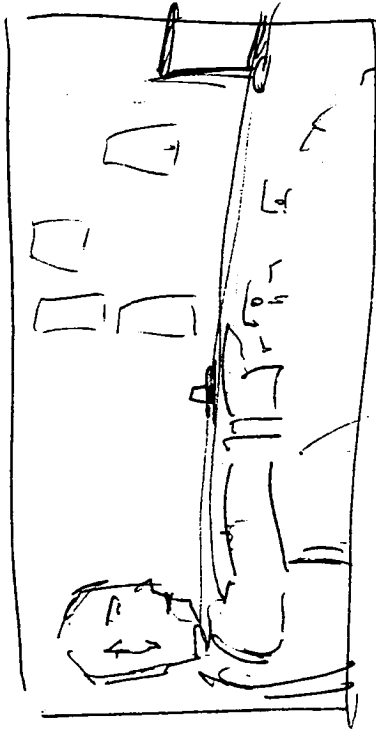
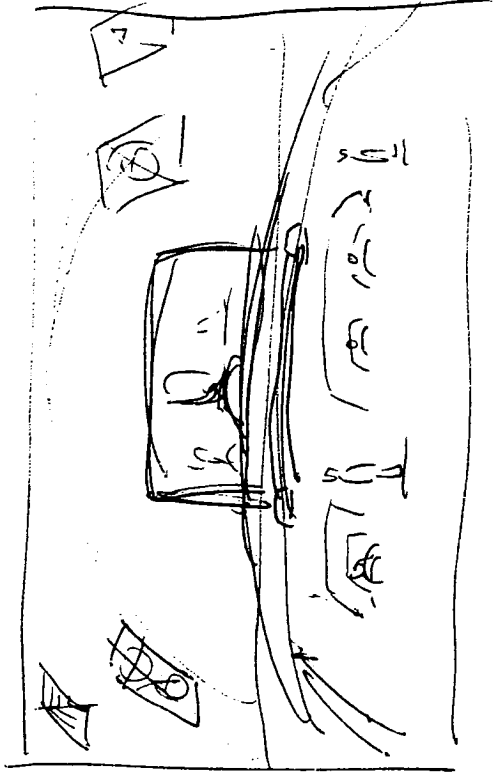
TOP VIEW



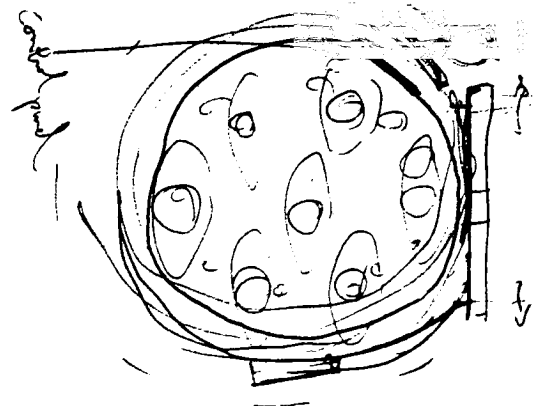
SIDE VIEW OF STAIRS



Bridge / Control Center



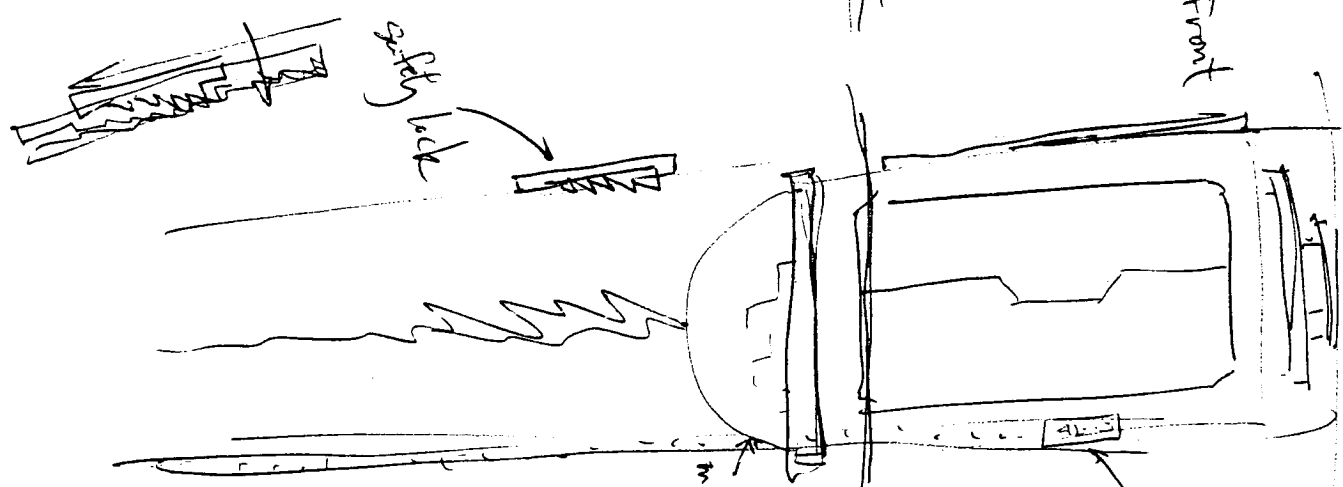
elevator



interior

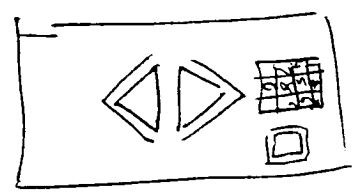
7 people

Front

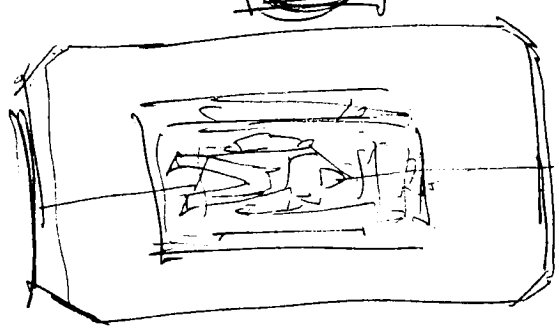


magnetic field generator

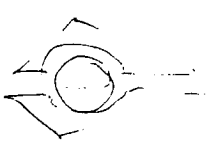
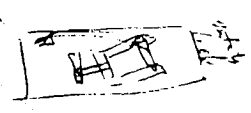
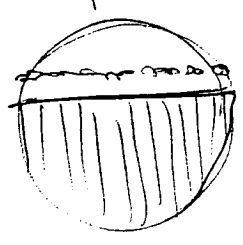
floor

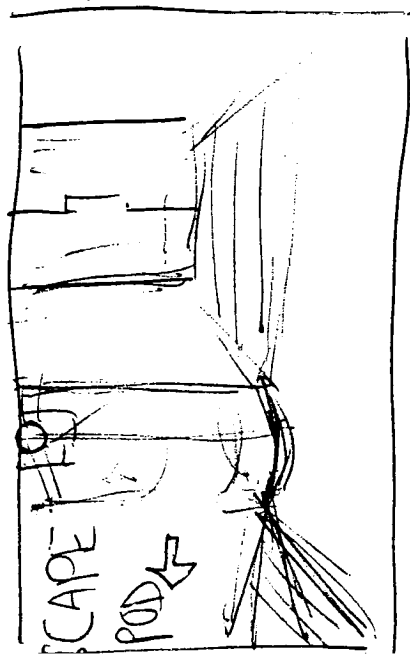
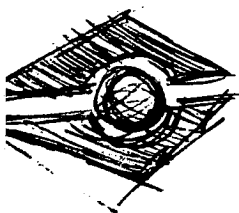
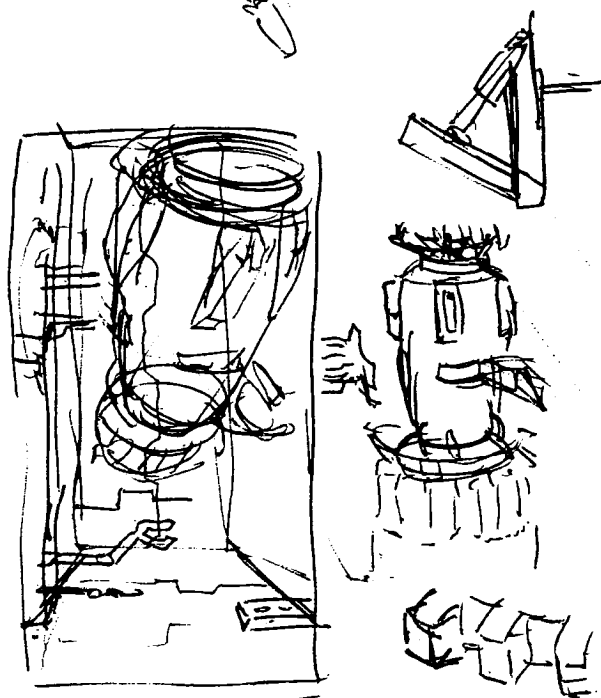
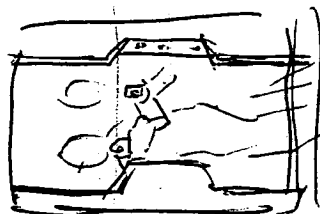
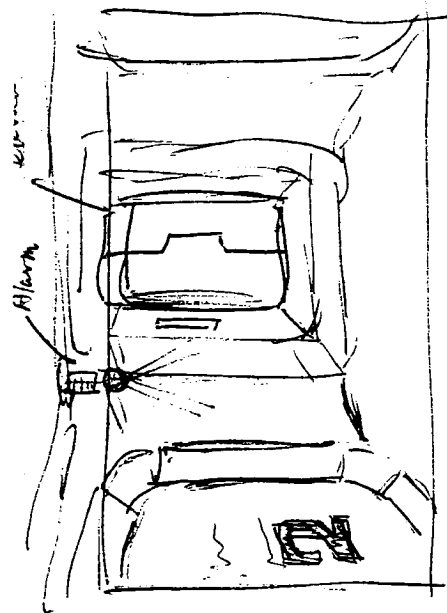
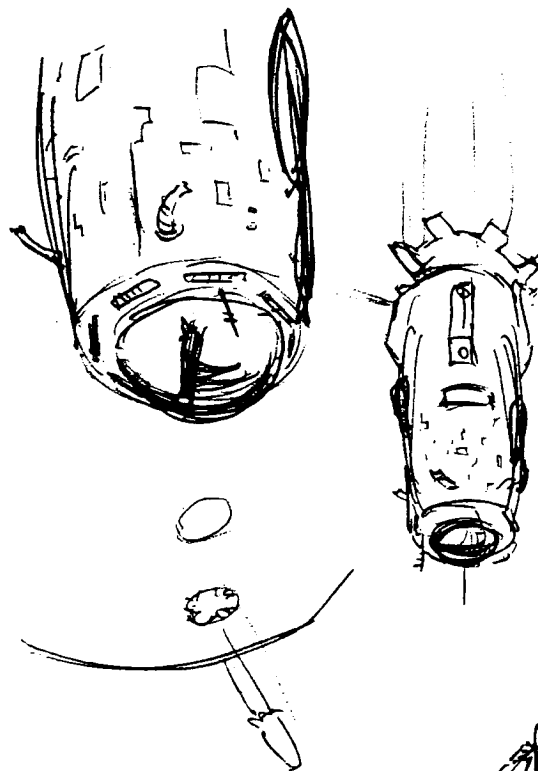
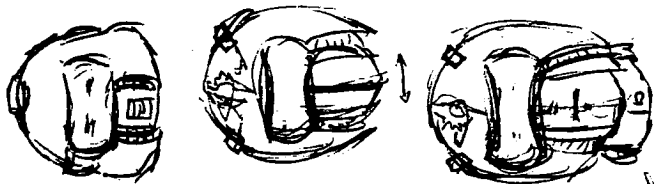


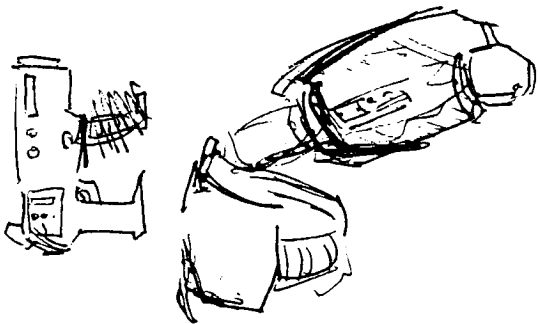
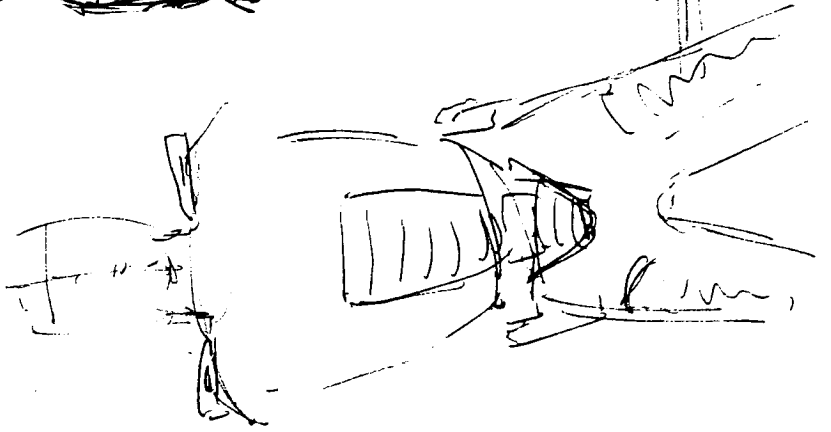
emergency override
up
down



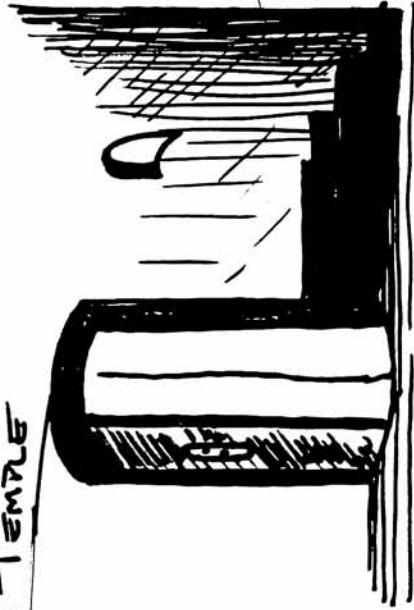
control panel



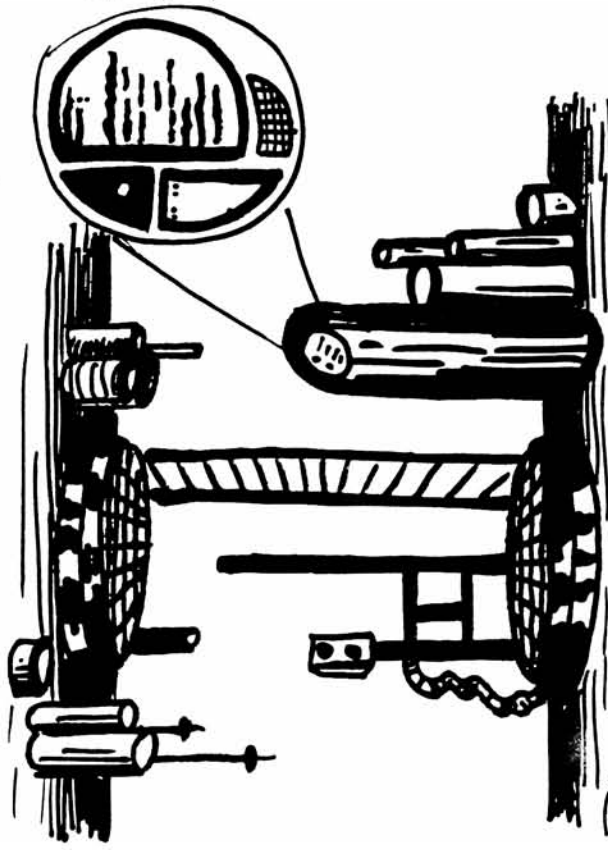




THE TEMPLE

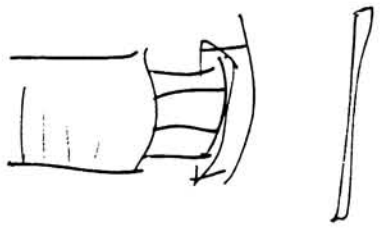
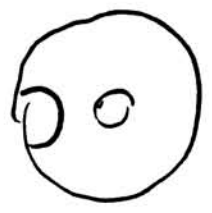
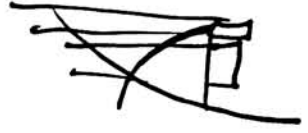
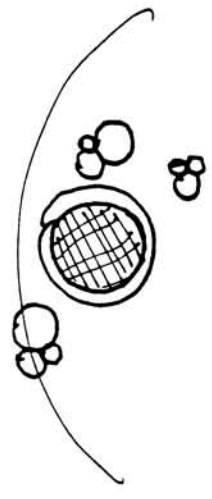
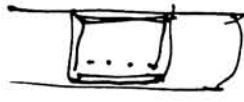
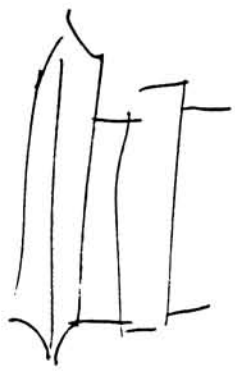


STAIRS



DIMENSIONAL SHIFTING CHAMBER

CONTROL PANEL
- Possible Destinations
- Audio Feedback
- Engagement Controls



A



B



C



D



E



F



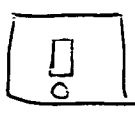
G



H



I



J



K



L



M



N



O



P



Q



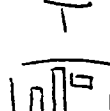
R



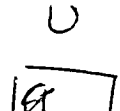
S



T



U



V



W



X



Y



Z



Advanced Scripting

The following three scripts are the complete advanced scripts for *Live It!* :

Movie Script

```
on startmovie
  global Number
  global zima
  global activate
  global download
  global upnumber
  global gender
  set the visibility of sprite 21 to false
  set the visibility of sprite 20 to false
  set the visibility of sprite 22 to false
  set the colordepth = 8
end startmovie
```

```
on init
  put 0 into zima
  put 0 into download
  put 0 into activate
  put 0 into upnumber
  put 0 into gender
  set the visibility of sprite 21 to false
  set the visibility of sprite 20 to false
  set the visibility of sprite 22 to false
end init
```

```
on checkmap
  global activate
  set activate = activate + 1
  if activate > 1 then set activate = 0
  if activate = 0 then set the visibility of sprite 21 to false
  if activate = 0 then set the visibility of sprite 22 to false
  if activate = 1 then set the visibility of sprite 21 to true
  if activate = 1 then set the visibility of sprite 22 to true
end checkmap
```

```
on info
  global download
  set download = download + 1
  set the visibility of sprite 20 to true
end info
```

```
—on discount
—set D = D + 1
—end discount
```

Lab Password Script

RIGHT

```
set C = C + 1
set the text of cast b14 = string(C)
if C > 2 then
  puppetsprite 9, false
  puppetsprite 11, false
  go to frame "Win"
else
  go the frame +1
end if
```

WRONG

```
put 0 into C
set the text of cast b14 = string(C)
```

Basement Game Script

```
on StartMovie
  global zima, upnumber
  if zima > 0 then go to frame "no"
end StartMovie
```

```
on init
  global upnumber
  put upnumber
  if upnumber > 0 then set the castnum of sprite 22 to (10 + upnumber)
  set the TimeoutLength to 240
  when Timeout then CheckVis
end init
```

```
on DiscTest1
  set x = the clickon
  puppetsound "click1"
  puppetsprite (x + 10), true
  if the castnum of sprite x > 10 then
    set the castnum of sprite x to (x - 1)
    set the visibility of sprite (x + 10) to 1
  else
    set the castnum of sprite x to (x + 47)
    set the visibility of sprite (x + 10) to 0
    updatestage
  end if
end DiscTest1
```

```
on clickTest
  if the DoubleClick then
    DiscTest2
  else
    DiscTest1
  end if
end ClickTest
```

```
on DiscTest2
  set x = the clickon
  puppetsound "click2"
```

```

puppetsprite (x + 10), true
if the castnum of sprite x > 10 then
  set the castnum of sprite x to (x - 1)
  put the castNum of sprite (x + 10) into y
  set z = y + 16
  if z > 41 then
    set the castnum of sprite (x + 10) to (y - 16)
  else
    set the castnum of sprite (x + 10) to (y + 16)
  end if
  set the visibility of sprite (x + 10) to 1
else
  set the castnum of sprite x to (x + 47)
  set the visibility of sprite (x + 10) to 0
  updatestage
end if
end DiscTest2

on CheckVis
  set a = 12
  set b = 0
  repeat with a = 12 to 20
    if the visibility of sprite a = 1 then set b = b + 1
  end repeat
  if b = 9 then Check
end CheckVis

on Check
  global bat, upnumber, zima
  — Horizontal Checks
  set a = 12
  set b = 0
  set bat = 0
  repeat with a = 12 to 14
    if the castnum of sprite a = (a + 5) then set b = b + 1
  end repeat
  if b = 3 then Clear
  set b = 0
  repeat with a = 15 to 17
    if the castnum of sprite a = (a + 5) then set b = b + 1
  end repeat
  if b = 3 then Clear
  set b = 0
  repeat with a = 18 to 20
    if the castnum of sprite a = (a + 5) then set b = b + 1
  end repeat
  if b = 3 then Clear
  set a = 12
  set b = 0
  repeat with a = 12 to 14
    if the castnum of sprite a = (a + 21) then set b = b + 1
  end repeat
  if b = 3 then Clear
  set b = 0
  repeat with a = 15 to 17
    if the castnum of sprite a = (a + 21) then set b = b + 1
  end repeat
  if b = 3 then Clear
  set b = 0
  repeat with a = 18 to 20
    if the castnum of sprite a = (a + 21) then set b = b + 1
  end repeat
  if b = 3 then Clear

```

— Vertical Checks

```
set b = 0
repeat with a = 10 to 16
  set a = a + 2
  if the castnum of sprite a = (a + 5) then set b = b + 1
end repeat
if b = 3 then Clear
set b = 0
repeat with a = 11 to 17
  set a = a + 2
  if the castnum of sprite a = (a + 5) then set b = b + 1
end repeat
if b = 3 then Clear
set b = 0
repeat with a = 12 to 18
  set a = a + 2
  if the castnum of sprite a = (a + 5) then set b = b + 1
end repeat
if b = 3 then Clear
set b = 0
repeat with a = 10 to 16
  set a = a + 2
  if the castnum of sprite a = (a + 21) then set b = b + 1
end repeat
if b = 3 then Clear
set b = 0
repeat with a = 11 to 17
  set a = a + 2
  if the castnum of sprite a = (a + 21) then set b = b + 1
end repeat
if b = 3 then Clear
set b = 0
repeat with a = 12 to 18
  set a = a + 2
  if the castnum of sprite a = (a + 21) then set b = b + 1
end repeat
if b = 3 then Clear
— Diagonal Checks
set b = 0
repeat with a = 9 to 17
  set a = a + 3
  if the castnum of sprite a = (a + 5) then set b = b + 1
end repeat
if b = 3 then Clear
set b = 0
repeat with a = 9 to 17
  set a = a + 3
  if the castnum of sprite a = (a + 21) then set b = b + 1
end repeat
if b = 3 then Clear
set b = 0
repeat with a = 13 to 17
  set a = a + 1
  if the castnum of sprite a = (a + 5) then set b = b + 1
end repeat
if b = 3 then Clear
set b = 0
repeat with a = 13 to 17
  set a = a + 1
  if the castnum of sprite a = (a + 21) then set b = b + 1
end repeat
puppetsound "bad"
if b = 3 then Clear
if bat = 0 then uplevel
```

```
if upnumber = 3 then
  set the timeOutLength to 10800
  when timeOut then nothing
  set zima = 1
  puppetSound "resume"
  puppetSprite 12, false
  puppetSprite 13, false
  puppetSprite 14, false
  puppetSprite 15, false
  puppetSprite 16, false
  puppetSprite 17, false
  puppetSprite 18, false
  puppetSprite 19, false
  puppetSprite 20, false
  puppetSprite 22, false
  go the frame +5
end if
end check

on Clear
  global bat, upnumber
  set upnumber = 0
  set bat = 1
  puppetSprite 2, false
  puppetSprite 3, false
  puppetSprite 4, false
  puppetSprite 5, false
  puppetSprite 6, false
  puppetSprite 7, false
  puppetSprite 8, false
  puppetSprite 9, false
  puppetSprite 10, false
  repeat with z = 12 to 20
    set the castnum of sprite z to (z + 5)
  end repeat
  set the castnum of sprite 22 to 10
  go to frame 4
end Clear

on uplevel
  global upnumber
  puppetSound "good"
  — put upnumber
  set upnumber = upnumber + 1
  — put upnumber
  set the castnum of sprite 22 to (10 + upnumber)
  repeat with z = 12 to 20
    set the castnum of sprite z to (z + 5)
  end repeat
  puppetSprite 2, false
  puppetSprite 3, false
  puppetSprite 4, false
  puppetSprite 5, false
  puppetSprite 6, false
  puppetSprite 7, false
  puppetSprite 8, false
  puppetSprite 9, false
  puppetSprite 10, false
  updateStage
  go to frame 4
end uplevel
```

Beta Testing Questionnaire

The following appendix contains a small sample of the student beta test responses to *Live It!*. A total of over 20 people were sampled, however only three have been provided here for the purpose of space and clarity.

Subject: Interactive Entertainment

Reviewer:

KEITH CAMPBELL

Project: Live It!

Date:

4-22-94

Author: Gedeon Maheux & Talos Tsui

Target Audience: between teenage and 35

Please circle the numbers which most appropriately reflect your impressions about using this computer system.
Not Applicable = NA. There is room on the last page for your written comments.

Part 1 Overall User Reactions

1.1 How familiar are you with computers

not at all

very

1 2 3 4 5 6 7 8 9 NA

1.2 Do you play computer/video games

never

always

1 2 3 4 5 6 7 8 9 NA

1.3 Overall reactions to the system

terrible

wonderful

1 2 3 4 5 6 7 8 9 NA

1.4

frustrating

satisfying

1 2 3 4 5 6 7 8 9 NA

1.5

dull

stimulating

1 2 3 4 5 6 7 8 9 NA

1.6

difficult

easy

1 2 3 4 5 6 7 8 9 NA

Part 2 Screen

2.1 Characters on the computer screen

hard to read

easy to read

1 2 3 4 5 6 7 8 9 NA

2.2 Image of characters

fuzzy

sharp

1 2 3 4 5 6 7 8 9 NA

2.3 Character shapes (fonts)

barly legible

very legible

1 2 3 4 5 6 7 8 9 NA

2.4 Was the highlighting on the screen helpful?

not at all

very much

1 2 3 4 5 6 7 8 9 NA

2.5 Were the screen layouts helpful?

never

always

1 2 3 4 5 6 7 8 9 NA

2.6 Amount of information that can be displayed on screen

inadequate

adequate

1 2 3 4 5 6 7 8 9 NA

TITLE MOVIE - credits well...

2.7 Arrangement of information on screen

illogical 1 2 3 4 5 6 7 8 9 logical
NA

2.8 Sequence of screens

confusing 1 2 3 4 5 6 7 (8) 9 clear
NA

2.9 Next screen in a sequence

unpredictable 1 2 3 4 5 6 (7) 8 9 predictable
NA

2.91 Going back to the previous screen

impossible 1 2 3 4 5 6 7 8 (9) easy
NA

2.92 Beginning, middle and end of tasks

confusing 1 2 3 4 5 6 7 8 9 clearly marked
NA

Part 3 Terminology and System Information

3.1 Use of terms throughout system

inconsistent 1 2 3 4 5 6 7 8 9 consistent
NA

3.2 Task terms

inconsistent 1 2 3 4 5 6 7 (8) 9 consistent
NA

3.3 Computer terms

inconsistent 1 2 3 4 5 6 7 8 (9) consistent
NA

3.4 Does the terminology relate well to the work you are doing

unrelated 1 2 3 4 5 6 7 (8) 9 well related
NA

3.5 Computer terminology is used

too frequently 1 2 3 4 5 6 (7) 8 9 appropriately
NA

3.6 Terms on the screen

ambiguous 1 2 3 4 5 (6) 7 8 9 precise
NA

3.7 Messages which appear on screen

inconsistent 1 2 3 4 5 6 7 (8) 9 consistent
NA

3.8 Position of instructions on the screen

inconsistent 1 2 3 4 5 6 7 (8) 9 consistent
NA

3.9 Messages which appear on screen

confusing 1 2 3 4 5 (6) 7 8 9 clear
NA

3.91 Instructions for commands or choices

confusing 1 2 3 4 5 (6) 7 8 9 clear
NA

3.92 Instructions for correcting errors

confusing 1 2 3 4 (5) 6 7 8 9 clear
NA

Part 4 Learning

- | | | |
|---|--|-------------------|
| 4.1 Learning to operate the system | difficult
1 2 3 4 5 <u>6</u> 7 8 9 | easy
NA |
| 4.2 Getting started | difficult
1 2 3 4 <u>5</u> 6 7 8 9 | easy
NA |
| 4.3 Learning advanced features | difficult
1 2 3 4 5 6 7 <u>8</u> 9 | easy
NA |
| 4.4 Time to learn to use the system | slow
1 2 3 4 5 <u>6</u> 7 8 9 | fast
NA |
| 4.5 Exploration of features by trial and error | discouraging
1 2 3 4 5 <u>6</u> 7 8 9 | encouraging
NA |
| 4.6 Exploration of features | risky
1 2 3 4 5 6 7 <u>8</u> 9 | safe
NA |
| 4.7 Discovering new features | difficult
1 2 3 4 5 6 7 <u>8</u> 9 | easy
NA |
| 4.8 Is the 3D imagery helpful to understand the environment | not at all
1 2 3 4 5 6 7 8 <u>9</u> | yes
NA |
| 4.9 Animations sequence easy to understand | difficult
1 2 3 4 5 6 7 8 <u>9</u> | easy
NA |
| 4.91 Is sound effects helpful | never
1 2 3 4 5 6 7 8 <u>9</u> | always
NA |
| 4.92 Is action accompany with sound helpful | confusing
1 2 3 4 5 6 7 8 <u>9</u> | clear
NA |

Part 5 Systems

- | | | |
|--|---|--------------|
| 5.1 Are the needs of both experienced and inexperienced users are taken into consideration | never
1 2 3 4 5 <u>6</u> 7 8 9 | always
NA |
| 5.2 Novices can accomplish tasks knowing only a few commands | with difficulty
1 2 3 4 5 <u>6</u> 7 8 9 | easily
NA |
| 5.3 Experts can use features / shortcuts | with difficulty
1 2 3 4 5 6 7 <u>8</u> 9 | easily
NA |
| 5.4 The speed/paste of the game
<i>pace</i> | slow
1 2 3 4 5 6 <u>7</u> 8 9 | fast
NA |

Part 6 User's Comments

6.1 Comments on Introduction Animation

* Original intro. Perhaps a better transition between the intro. movie + starting of the game would make the gameplay smoother.

6.2 Comments on sound effects and musics

* Definitely adds to the experience of the games. The sound + music hooks + drags you into the game.

6.3 Comments on game play

* Initially the game is difficult getting started, but as an experienced game player it is great to encounter difficulty or situations in a role-play that are not easily solved but challenging. The interest generated by the graphics + environment keep one playing + trying.

6.4 Comments on graphics

* The realism used in the graphics + the environments is terrific + most the game very inviting.

Subject: Interactive Entertainment

Reviewer: Wendy Combs

Project: Live It!

Date: 4-22-94

Author: Gedeon Maheux & Talos Tsui

Target Audience: between teenage and 35

Please circle the numbers which most appropriately reflect your impressions about using this computer system.
Not Applicable = NA. There is room on the last page for your written comments.

Part 1 Overall User Reactions

1.1 How familiar are you with computers

not at all
1 2 3 4 5 6 7 **(8)** 9 NA

1.2 Do you play computer/video games

never
(1) 2 3 4 5 6 7 8 9 NA

1.3 Overall reactions to the system

terrible
1 2 3 4 5 6 7 8 **(9)** NA

1.4

frustrating
1 2 3 4 5 6 7 **(8)** 9 NA

1.5

dull
1 2 3 4 5 6 7 8 **(9)** NA

1.6

difficult
1 2 3 4 5 6 **(7)** 8 9 NA

Part 2 Screen

2.1 Characters on the computer screen

hard to read
1 2 3 4 5 6 **(7)** 8 9 NA

2.2 Image of characters

fuzzy
1 2 3 4 5 6 7 8 **(9)** NA

2.3 Character shapes (fonts)

barly legible
1 2 3 4 5 6 **(7)** 8 9 NA

2.4 Was the highlighting on the screen helpful?

not at all
1 2 3 4 5 6 7 8 **(9)** NA

2.5 Were the screen layouts helpful?

never
1 2 3 4 5 6 7 8 **(9)** NA

2.6 Amount of information that can be displayed on screen

inadequate
1 2 3 4 5 6 7 8 9 NA

2.7 Arrangement of information on screen

illogical 1 2 3 4 5 6 7 8 (9) NA logical

2.8 Sequence of screens

confusing 1 2 3 4 5 6 (7) 8 9 NA clear

2.9 Next screen in a sequence

unpredictable 1 2 3 (4) 5 6 7 8 9 NA predictable

2.91 Going back to the previous screen

impossible 1 2 3 4 5 6 7 8 (9) NA easy

2.92 Beginning, middle and end of tasks

confusing 1 2 3 4 5 (6) 7 8 9 NA clearly marked

Part 3 Terminology and System Information

3.1 Use of terms throughout system

inconsistent 1 2 3 4 5 6 7 (8) 9 NA consistent

3.2 Task terms

inconsistent 1 2 3 4 5 6 7 (8) 9 NA consistent

3.3 Computer terms

inconsistent 1 2 3 4 5 6 7 (8) 9 NA consistent

3.4 Does the terminology relate well to the work you are doing

unrelated 1 2 3 4 5 6 7 (8) 9 NA well related

3.5 Computer terminology is used

too frequently 1 2 3 4 5 (6) 7 8 9 NA appropriately

3.6 Terms on the screen

ambiguous 1 2 3 4 5 (6) 7 8 9 NA precise

3.7 Messages which appear on screen

inconsistent 1 2 3 4 5 6 7 8 (9) NA consistent

3.8 Position of instructions on the screen

inconsistent 1 2 3 4 5 6 7 8 (9) NA consistent

3.9 Messages which appear on screen

confusing 1 2 3 4 5 (6) 7 8 9 NA clear

3.91 Instructions for commands or choices

confusing 1 2 3 4 5 6 7 8 (9) NA clear

3.92 Instructions for correcting errors

confusing 1 2 3 (4) 5 6 7 8 9 NA clear

Part 4 Learning

- | | | |
|---|--|-------------------|
| 4.1 Learning to operate the system | difficult
1 2 3 4 5 6 7 8 9 | easy
NA |
| 4.2 Getting started | difficult
1 2 3 4 5 6 7 8 9 | easy
NA |
| 4.3 Learning advanced features | difficult
1 2 3 4 5 6 7 8 9 | easy
NA |
| 4.4 Time to learn to use the system | slow
1 2 3 4 5 6 7 8 9 | fast
NA |
| 4.5 Exploration of features by trial and error | discouraging
1 2 3 4 5 6 7 8 9 | encouraging
NA |
| 4.6 Exploration of features | risky
1 2 3 4 5 6 7 8 9 | safe
NA |
| 4.7 Discovering new features | difficult
1 2 3 4 5 6 7 8 9 | easy
NA |
| 4.8 Is the 3D imagery helpful to understand the environment | not at all
1 2 3 4 5 6 7 8 9 | yes
NA |
| 4.9 Animations sequence easy to understand | difficult
1 2 3 4 5 6 7 8 9 | easy
NA |
| 4.91 Is sound effects helpful | never
1 2 3 4 5 6 7 8 9 | always
NA |
| 4.92 Is action accompany with sound helpful | confusing
1 2 3 4 5 6 7 8 9 | clear
NA |

Part 5 Systems

- | | | |
|--|---|--------------|
| 5.1 Are the needs of both experienced and inexperienced users are taken into consideration | never
1 2 3 4 5 6 7 8 9 | always
NA |
| 5.2 Novices can accomplish tasks knowing only a few commands | with difficulty
1 2 3 4 5 6 7 8 9 | easily
NA |
| 5.3 Experts can use features / shortcuts | with difficulty
1 2 3 4 5 6 7 8 9 | easily
NA |
| 5.4 The speed/paste of the game
<i>price</i> | slow
1 2 3 4 5 6 7 8 9 | fast
NA |

Part 6 User's Comments

6.1 Comments on Introduction Animation

They were great.

6.2 Comments on sound effects and musics

Sound effects + music added
to the overall intrigue to the game.

6.3 Comments on game play

I was confused at first as to the object
or where the game was supposed to go.
But the more I played the more ~~intro~~
intrigued + understood the object of the game.

6.4 Comments on graphics

Maybe a little more of an introduction
to the game - just to let viewers know
everything is an important clue.

Reviewer: Gary LaBrecx

Date: 4-22

Target Audience: between teenage and 35

Part 1 Overall User Reactions

not at all		very							
1	2	3	4	5	6	7	8	9	NA

never 1 2 3 4 5 6 7 8 9 always
NA

terrible		wonderful
1 2 3 4 5 6 7 8 9		NA

frustrating		satisfying
1 2 3 4 5 6 7 8 9		NA

dull stimulating

1 2 3 4 5 6 7 8 9 NA

difficult easy

1 2 3 4 5 6 7 8 9 NA

hard to read easy to read

1 2 3 4 5 6 7 8 9 NA

fuzzy										sharp
	1	2	3	4	5	6	(7)	8	9	NA

barly legible										very legible									
1	2	3	4	5	6	7	8	9		1	2	3	4	5	6	7	8	9	NA

not at all		very much							
1	2	3	4	5	6	7	8	9	NA

never always

1 2 3 4 5 6 7 8 9 NA

inadequate		adequate
1	2 3 4 5 6 7 8 9	NA

2.7 Arrangement of information on screen

illogical 1 2 3 4 5 6 7 8 9 logical
NA

2.8 Sequence of screens

confusing 1 2 3 4 5 6 7 8 9 clear
NA

2.9 Next screen in a sequence

unpredictable 1 2 3 4 5 6 7 8 9 predictable
NA

2.91 Going back to the previous screen

impossible 1 2 3 4 5 6 7 8 9 easy
NA

2.92 Beginning, middle and end of tasks

confusing 1 2 3 4 5 6 7 8 9 clearly marked
NA

Part 3 Terminology and System Information

3.1 Use of terms throughout system

inconsistent 1 2 3 4 5 6 7 8 9 consistent
NA

3.2 Task terms

inconsistent 1 2 3 4 5 6 7 8 9 consistent
NA

3.3 Computer terms

inconsistent 1 2 3 4 5 6 7 8 9 consistent
NA

3.4 Does the terminology relate well to the work you are doing

unrelated 1 2 3 4 5 6 7 8 9 well related
NA

3.5 Computer terminology is used

too frequently 1 2 3 4 5 6 7 8 9 appropriately
NA

3.6 Terms on the screen

ambiguous 1 2 3 4 5 6 7 8 9 precise
NA

3.7 Messages which appear on screen

inconsistent 1 2 3 4 5 6 7 8 9 consistent
NA

3.8 Position of instructions on the screen

inconsistent 1 2 3 4 5 6 7 8 9 consistent
NA

3.9 Messages which appear on screen

confusing 1 2 3 4 5 6 7 8 9 clear
NA

3.91 Instructions for commands or choices

confusing 1 2 3 4 5 6 7 8 9 clear
NA

3.92 Instructions for correcting errors

confusing 1 2 3 4 5 6 7 8 9 clear
NA

Part 4 Learning

- 4.1 Learning to operate the system difficult easy
1 2 3 4 5 6 7 8 9 NA
- 4.2 Getting started difficult easy
1 2 3 4 5 6 7 8 9 NA
- 4.3 Learning advanced features difficult easy
1 2 3 4 5 6 7 8 9 NA
- 4.4 Time to learn to use the system slow fast
1 2 3 4 5 6 7 8 9 NA
- 4.5 Exploration of features by trial and error discouraging encouraging
1 2 3 4 5 6 7 8 9 NA
- 4.6 Exploration of features risky safe
1 2 3 4 5 6 7 8 9 NA
- 4.7 Discovering new features difficult easy
1 2 3 4 5 6 7 8 9 NA
- 4.8 Is the 3D imagery helpful to understand the environment not at all yes
1 2 3 4 5 6 7 8 9 NA
- 4.9 Animations sequence easy to understand difficult easy
1 2 3 4 5 6 7 8 9 NA
- 4.91 Is sound effects helpful never always
1 2 3 4 5 6 7 8 9 NA
- 4.92 Is action accompany with sound helpful confusing clear
1 2 3 4 5 6 7 8 9 NA

Part 5 Systems

- 5.1 Are the needs of both experienced and inexperienced users are taken into consideration never always
1 2 3 4 5 6 7 8 9 NA
- 5.2 Novices can accomplish tasks knowing only a few commands with difficulty easily
1 2 3 4 5 6 7 8 9 NA
- 5.3 Experts can use features / shortcuts with difficulty easily
1 2 3 4 5 6 7 8 9 NA
- 5.4 The speed/paste of the game slow fast
2 3 4 5 6 7 8 9 NA

Part 6 User's Comments

6.1 Comments on Introduction Animation

~~Very quickly and it's a little bit long and slow and not as much as I would like to see.~~
~~See the intro. Some more from the intro because it's not as much as I would like to see.~~
~~at the end of the intro~~ Nice music, but would like to see more dramatic lighting and more experimental views (like the cartoon ad the world). ~~for~~ Nice music and sound effects. Would like to see the little a little more integrated into the beginning.

6.2 Comments on sound effects and musics

More of them is needed. It helps to hold you interest. Appropriate mysterious quality. The little keep when you can't do something is too heavy (would like to hear a deeper sound). Focus/magnification sound is really nice.

6.3 Comments on game play

Seems very static right now (although I think it is appropriate for a beginning / sub-hack section). The focus / wipe / pan, shifty obscures bits a little annoying (unless it's to see less variables). Although the focus is the most interesting, I would not use it as often (maybe when you approach a object like a complete screen or the character). Also the game seems very slow (maybe it's just the way it is) and no instructions (maybe some video might help overcome this).
 Would like to see regional expansion to go down there.

6.4 Comments on graphics

Very nice use of 3-D rendering. Lightly remain consistent, and certainly set in a certain appropriate mood. Looking at the character is very uncomfortable for me (experimentally, they are sketchy and too long period of time. (I don't right hand corner could be more comfortable). Some of the 'glances' seem a little cheesy. Camera display is really nice. Would like to see a different, I suppose, camera.

David Bunnell (editor), *New Media Magazine: Vol. 3, Issue 8*, HyperMedia Communications, Inc., San Mateo, CA, Aug 1993

David Bunnell (editor), *New Media Magazine: Vol. 4, Issue 6*, HyperMedia Communications, Inc., San Mateo, CA, June 1994

Lance Elko (editor), *CD-ROM Today: Vol. 1, Issue 2*, GP Publications, Inc., Fair Lawn, NJ April 1993

Lance Elko (editor), *CD-ROM Today: Vol. 1, Issue 3*, GP Publications, Inc., Fair Lawn, NJ June 1993

Philip Elmer-Dewitt, *Time Magazine*, Time Inc., New York, NY 1994

Quantel Incorporated, *Pre Press Definitions: An Introduction to Electronics In Print*, Quantel Inc., New York, NY 1993

Mike Saenz, *Reactor Chat*, America On-Line, Roanoke, VA 1994

Sanjay Sakhuja, *Digital Color Prepress: Vol One*, AGFA Corporation, Mt. Prospect, IL, 1993

Sanjay Sakhuja, *Digital Color Prepress: Vol Two*, AGFA Corporation, Mt. Prospect, IL, 1994

Gina Smith (editor), *Electronic Entertainment: Vol2, Issue 4*, Infotainment World, Inc. San Mateo, CA 1993

Johnny Wilson (editor), *Computer Gaming World: Vol.10*, Golden Empire Publications, Anaheim Hills, CA, July 1992

Ron Woodland, *Strata StudioPro User Manual*, Strata Incorporated, St. George, Utah, 1993

AIFF	(Audio Interchange File Format) A standard Macintosh sound format for different applications.
Alpha channel	An 8-bit channel reserved by some image-processing applications for masking or additional color information.
Anit-Aliasing	The rendering of hard-edged objects so they blend smoothly into the background.
AV	Audio Visual; describes audio and video technology that has been implemented into computer hardware.
Beta test	Final testing of software/hardware by the end user.
Blue screen	A background of a single color, that when viewed by the computer can be removed and replaced easily.
Bump map	A flat representation of an uneven surface which manipulates the interaction of light with a surface.
Castmember	The term that Macromedia uses to describe a single graphic element, sound, movie or animation within Macromedia Director.
CD-ROM	A compact disc containing read-only digital information that can be read by the computer as a form of storage and playback.
CLUT	(Color Look Up Table) A color indexing system used by some computers to reference colors if their systems do not support a high enough bit-depth to represent all colors.
Color depths	The capability of a computers display device such as 8-bit, 24-bit and 32-bit monitors.
Compression	Decreasing the size of an image file for storage with little or no distortion of the image data and quality.
CPU	(Central Processing Unit) The part of the computer that extracts instructions from memory and executes them. Including calculations and comparisons.
Digitize	The process of entering information into the computer from analog to digital format.
Dithering	The process of specifying color to adjacent pixels in order to simulate a third color in a bit mapped image. This technique is used when a full range of colors is not available.
DRAM	(Dynamic Random Access Memory) A modern computer memory device offering very high data packing density and data rates.
EPS	(Encapsulated PostScript) A file format used to transfer PostScript image information from one program to another.
Extruded	The process of "pushing" an object through a mold or template to define a surface along its main axis.
Film stripe	A file format used by Adobe Systems Inc. to transfer QuickTime movies to PICT file format from PhotoShop to Premiere and vice versa.
Filters	Processing effects used to manipulate photographic images to control color, or contrast or to add special effects.
Flat bed scanner	A device used to translate analog image information to digital format that can be understood by the computer.
FPS	(Frames Per Second) The number of images (frames) that can be displayed by the computer within a single second.
Frame	A single cell in Macromedia Director which contains all the castmembers present on the stage at any given moment.

Glossary

Games	An activity that is engaged in for diversion or amusement.
Global/Directional Light	Directional lights shine "toward" the model from a direction outside the model space. It is intended to simulate sunlight striking the earth.
Global variables	A "string" of characters that can be preset and transferred from one Macromedia Director movie to another for the process of calculation and instruction.
Gouraud	Method of rendering a 3-D object which does not take into account factors such as transparency, shadows or bump maps.
GUI	(Graphical User Interface) The way which users relate to the equipment they operate.
Hard Disk	A fixed magnetic storage medium in which the data holding element cannot be removed. They enable data to be rapidly accessed and manipulated.
Hardware	The physical elements of an electronic system.
Heads-up Display	Information that is displayed directly in front of the user. In this way, the user need not change his/her viewing angle to gain the needed data.
Hue	The wavelength of light of a color in its purest state (without the addition of white or black).
Human factors	Elements of human physical nature that are taken into consideration when designing for the end user.
Index Color	A color system that uses information from a file or software as a pointer to a lookup table of colors rather than specifying a color directly.
Lathing	The process of revolving 2-D objects through space to create 3-D objects.
Lingo	Name given by Macromedia to Director's scripting environment or language.
Mapping	The process of applying image files onto a 3-D object in order to simulate a surface or texture of the object.
MPEG	(Motion Picture Expert Group) A compression method for digitize video.
Multi-media	Any form of communication through the use of multiple components such as sound, movies, animations, graphics or interactivity.
Optimization	The process of streamlining a computer application in order to run at its most efficient level.
PC	(Personal Computer) Term given to small computer workstations which usually consists of a monitor, CPU and a keyboard.
Phong	A rendering algorithm that has the ability to calculate each surface pixel's color and allows Phong to include surface and environmental mapping in its rendering effects.
PICT	File format used for defining bit mapped or object-oriented images.
Pixel	The smallest distinct unit of a bit mapped image displayed on the screen.
Point light	A light source that shines outward in all directions from the source in 3-D models.
Postscript	A scripting language developed by Adobe Systems in the 1980's.
PPI	(Pixels Per Inch) A measure of the amount of scanned information. The finer the optics of the scanner, the high the scan resolution.
Quicktime	An animation format that is compiled by a series of PICTS and audio developed by Apple Computer Inc.

Radioicity	Rendering that calculates the light intensity of each surface in a scene as a function of the intensity of all other surfaces.
RAM	(Random Access Memory) The memory a computer uses to store the information it is processing at any given moment. This is short term memory and is lost when the power is turned off.
Raytracing	Rendering that traces rays of light backward through a model to determine how the image should appear from the chosen viewing position.
Real Time Processing	A computer's ability to handle data so fast that the user perceives no delay between giving an instruction and seeing the result.
Rendering	The process of resolving mathematical or data files into graphic images through the placement of pixels.
Resolution	The measure of how detailed and fine an image is.
Retouching	The changing of the amount or value of color in a part of an image. To add or delete elements to/from an image.
RGB	(Red, Green, Blue) The additive primary colors used for computer monitor displays.
ROM	(Read Only Memory) Usually permanent data storage that contains key instructions for the computer to start up and operate.
Saturation	A measure of the amount of gray in a color. The higher the gray content, the lower the saturation.
Scripting	The process of programming a set of instructions for the computer to carry out.
SCSI	(Small Computer System Interface) A type of connector used to attach peripherals such as an external hard drive or scanner to a computer.
Simulations	The representation of one system or process by means of the functioning of another such as a computer or industrial process.
Skinned	Creating 3-D objects by connecting or "skinning" a series of 2-D outlines or ribs to form a complete model.
Spot light	Simulates a real spot light using cone angle, distance from the model and intensity to light a scene.
Stage	The area (the screen) the castmembers were put into action in Macromedia Direction.
Stylus	An alternative to the mouse as a control for electronic devices. It resembles a pen and it is usually pressure sensitive.
System palette	The default Color Look Up Table for the Macintosh operating system.
TIFF	(Tagged Image File Format) A file format used to represent black-and-white, grayscale, or color bitmapped images, particularly those produced by scanners.
Transitions	The effects used to changing the screen smoothly from one frame to another in Macromedia Director.
Virtual Memory	A means of using storage memory on a disk to simulate RAM. This allows a computer to process much larger files and to perform much more complicated processing.

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