THE CYBERSPACE WORKPLACE

AN ARGUMENT AND DESIGN
FOR THE VIRTUAL OFFICE

by
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ABSTRACT

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The Virtual Office has become a viable solution to the need for a changing workplace.   Technology, design, and a redefinition of work have combined to create something entirely new. An office not of walls and doors but of electronic peripherals, networks, and global digital communication.   This concept allows workers to be free from their physical surrounding to conduct work from   remote locations or in some instances in a totally electronic world commonly referred to as Cyberspace. Through research, interviews, and problem solving the virtual office concept presented will redefine the use of space as we know it. These concepts will allow Architect's to be instrumental in the creation of these new virtual worlds while business and corporate America realize the benefits of this new form of workplace.

This thesis is dedicated to
late father Ronald C. Jones

ACKNOWLEDGMENT

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CHAPTER 1

INTRODUCTION
LESS IS MORE

When Mies van der Rohe made that statement it was in
regard to the architectural style being explored during
that   time period.   Steel and glass skyscrapers such as
the Seagram Building in New York City were giving new
meaning to the term "minimalism".   These structures that
so dominant the skylines of cities around the world were a
product of Corporate America. Today, Corporate America is
again taking a cue from Mies van der Rohe declaring less
in more in regards to corporate offices and space.   The
reasons for this reinterpretation of the office are many.
Rising rental costs for space, coupled with a worldwide
corporate down-sizing,   have left many of today's
business's with an abundance of high-priced, underutilized
real estate which accounts for a high percentage of a
corporations bottom line.   Offices are shrinking and the
way in which they are being designed is changing. Most
professionals today no longer need a place to work from 9
to 5. Hence a new office is upon us and it comes complete
with its own vocabulary   technology, and outlook for an
improved future.   The concept is known as the "Virtual
Office"   born from the idea of   tele-commuting it is
rapidly becoming mainstream and as such creating an
exciting opportunity for architects and designers to

to explore new avenues of design. The technology and advances made in the area of personal computers has allowed the virtual office or V.O. to become a viable solution to reducing office space and allowing a work force to be free of its physical surroundings. Tools such as the cellular phone, fax machine, teleconferencing, satellite paging systems, and the personal computer make it possible for individuals to work from remote locations. The personal computer alone will allow business to enter the next century with a new media that will take global communications to unprecedented heights. This new media will perhaps be one of the greatest technological advancements of our time. Today "Virtual Reality" is in its infantile stage. Within a few short years this interactive media will bring the virtual office to a new level. Most business will be conducted in a completely digital virtual space with limitations unknown. This paper will explore the concept of the virtual office, reasons for its creation and evolution, how it is impacted by virtual reality, as well a proposing a V.O. design for a software company in downtown Ft. Lauderdale, Florida. I will also look at a virtual interface for that company. The intent is to make aware to industry professionals this new idea and ways in which it can be utilized.

CHAPTER 2

PAST PARADIGMS

When looking at redefining the corporate office it is important to take a look back at how we arrived at were we are today. Although some people may question the need to break free of the traditional office one must remember that current configurations for space are an outgrowth of the centralized work locations that emerged during the industrial revolution.   During that time large factories created centralized locations for labor and management control which became the model for modern offices as they began to evolve. William Davidow, author of the Virtual Corporation adds,   The companies of today are based on 100 year old technology. They are an extension of the concepts of Frederick Winslow Taylor, inventor of scientific management, and Henry Ford, perfector of mass production.   In the days of Taylor and Ford the best way to produce goods effectively was to build them in rigidly tooled, mass-production facilities." [1] In today's   high-tech society an office modeled after a factory would be quite antiquated. Besides, we are moving toward a more information based society and away from a manufacturing one.   In 1906 Frank LLoyd Wright's Larkin Building (figure 1) became a model for space utilization within a

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I Davidow, William. The Virtual Corporation, Harper Collins Publishers, N.Y.

centralized location. A large interior court housed the secretarial pool on the ground floor while support staff and management occupied the upper balconies and perimeter offices.   Managers felt the need to exert control and the best possible way was to be able to look down upon their workers to monitor productivity.

Figure 1 The Larkin Building Atrium 1906

This is not unlike the office's we find in   most of today's corporations. "To many managers today,   physical presence, punctuality, and the illusion of activity equal productivity." says Dr. James Trent, a business psychologist. "We are stuck in all these traditional ways of measuring and valuing people that are truly anachronistic, It's an industrial model." [2]   This type

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[2]The Construction Specifier, April 1993

of layout has created a class structure within an organization that is evident by **size** and location of **work** space.

Class structure is a problem for most organizations **and** has resulted in a mis-allocation of square footage with lower level employees **receiving** less space and managers getting the surplus. With **regards** to space allocation, in 1971 office space averaged 156 square feet per worker **which** has grown steadily to 278 square feet per person by 1991. This figure takes into account **not** just work areas but corridors, lobbies, conference rooms, etc. With corporate down-sizing **and** consolidation that number has dropped to 200 square feet **today and** real estate **experts expect** the number **to drop back down to** 150 square feet in **the** future. This trend is not **just** about shrinking the office but also includes **an** entirely new way of conceiving the space and **how** it is used.

Location o**f** the entire facility has long been driven by **corporate** image rather than employee access. **During** the great building era's **after** World War II when **land was** relatively inexpensive the **norm** was to **build** as close to **downtown** cities as possible or in large suburban **complexes** This **was** in order to create a high profile image or showpiece for a company **which** at that time **was** thought to be essential. However, at **the** same time **we** saw skilled workers and professionals leaving the cities and areas of high concentration for **more** quiet, better

lifestyle in the underdeveloped suburbs. Hence the era of the automobile and clogged commuter highways. Most areas across the United States today lack the proper infrastructure to support such a trend.

In the early 1970's while corporate America was busy filling the landscape with sealed office towers and sprawling suburban complexes , with little regard for transportation and accessibility, a very different concept for the office was emerging in Europe. Herman Hertzberger, a Dutch Architect, led the way with his design for the Centraal Beheer insurance company headquarters in Holland (figure 2).

FIGURE 2 Central Beheer Headquarters

This complex for over 1,000 employees is woven into an urban fabric, configured with interior streets, office clusters, atriums linked by raised walkways, and common spaces to maximize social interaction.   More than 20 years later it is considered a success by it's employees and offers many benefits relating to communal space within an organization.   What you will see is more emphasis   being placed on common space with the single office model being reserved for only a few executives.

WHO IS THIS NEW WORKER

The changing **work** force **and** the **way** individuals perform **work** is considered **to be** one of the major factors **behind** the push toward the virtual office. The notion of employees as **cogs in** a machine **is being tossed** out the window. Workers have begun to develop a different set of priorities relating to their **work.** We look **back** at the **industrial** model to realize the roots of **the problem.** The wall street journal reported in 1992," Most **U.S.** companies still follow the **precepts** of "scientific management". **In** that structure, **managers** were paid to think, and workers were paid to follow orders as unthinking extensions of a machine. Prof. Thomas **Hughes** of the University of Pennsylvania traces th**e current funk about U.S. work** habits to **manager's inability** to devise a workplace suited **to** liberate, independent-minded **workers.** "The values **have** changed; the **workers** have **changed," he** says." **³** Along **with** a fundamental **change in** the **worker** is the type of work that is being performed. **In many** service **industries,** substantial **numbers** of workers are **found to** be out of their offices a **good deal** of the time. They are either on the **road or** meeting with clients at another location. Those **that work** from home are called tele-commuters. Although **not** a **new phenomenon,** tele-

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"Wall Street Journal, March 1992

commuting *has* been around for the past 10 years but has not gained popular acceptance until only a few years ago. In 1991 there were 5.5 million tele-commuters in this country alone with that number expected to rise to 11 million by 1995. This represents nearly 10 percent of the American workforce. By contrast the nature of some work requires individuals to work in groups or teams in order to complete tasks and projects. This idea of group spaces not only increases productivity among employees but it helps to promote a sense of community within a facility. Fortune magazine describes work groups as, "Teams consisting of between 3 and 30 workers-sometimes blue collar, sometimes white collar, sometimes both. Companies that use them-and they work as well in service or finance businesses as they do in manufacturing-usually see productivity rise dramatically. That's because teams composed of people with different skills, from different parts of the country, can swoop around bureaucratic obstacles and break through the walls separating different functions to get a job done."[4] The layout of 15 autonomous individuals in separate offices being supported by one secretary down the hall is fast becoming replaced by a team of 16 working together in a common area. Of course this common area or group space will be adjacent to single offices or workstations when a more private place is needed. For example, Apple Computer in

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[4]Fortune Magazine, "Who Needs a Boss", May 1990

Cupertino, Ca. hired HOK and interior designers from San Francisco to design a new research and development campus for their engineers. For professions like engineering, and software development the work dictates the space. Engineers work best when given areas to collaborate as a team as well as private space for individual more focused work. The design (figure 3) calls for team space at various locations throughout the facility. This space is loosely arranged with movable furniture so the area can be easily modified for it's intended use, communications devices and floor to ceiling white boards in these areas make them a complete working area.
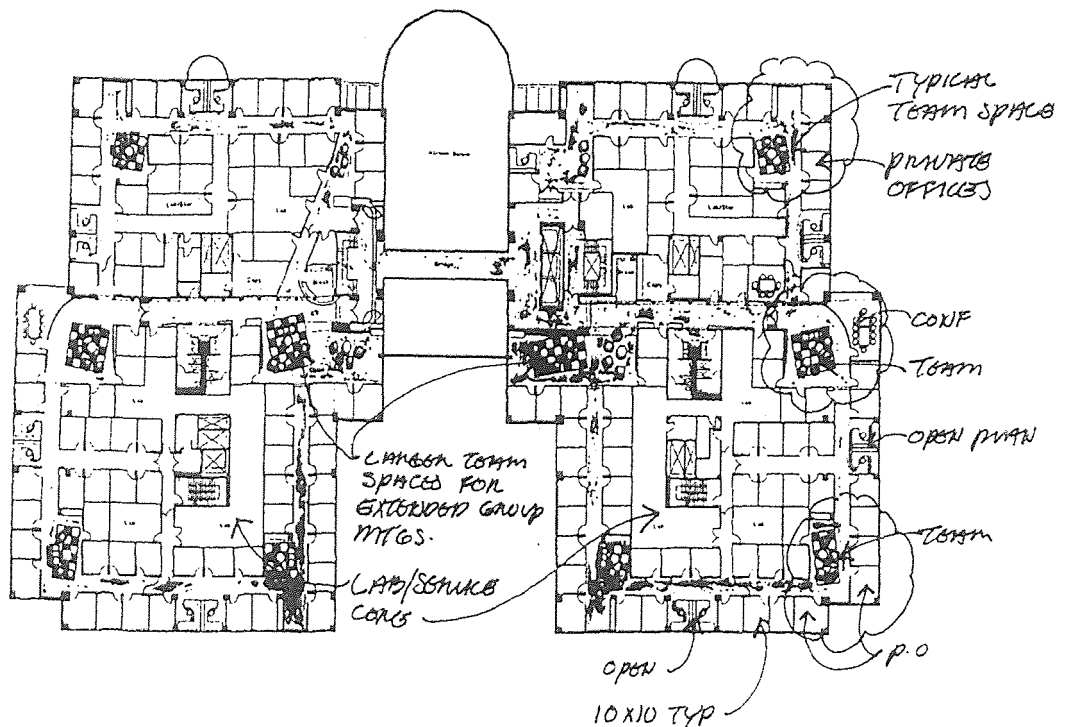
FIGURE 3 Apple headquarters designed by H.O.K.

Private offices are close by so engineers can have the best of both worlds. Still, other types of business require even less physical space. For sales associates, it is not uncommon to arrive at the office in the morning and then leave the office for client meetings all day, not returning to the office until the following morning. With this type of work we find offices being set up mainly as incubator spaces. A phone and desk is all most associates need. The mobile staff can use any of the usually autonomous stations (figure 4) when needed or schedule time for use of a conference room.
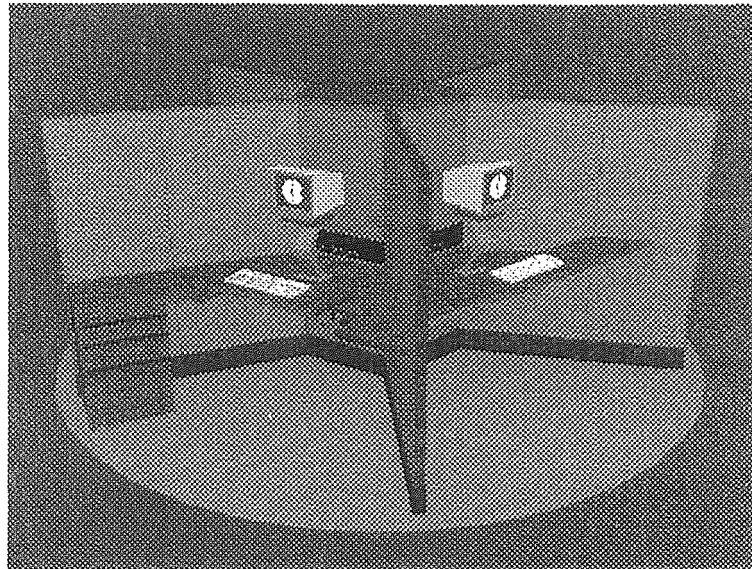
FIGURE 4 An autonomous workstation setup

This type of setup is usually referred to as business hoteling. Typically a ratio is set up usually 3-1 or 5-1 between the number of workstations and the number of employees. This method is also known as group address.

Some types of business are conducted on an as needed basis. Usually this involves consultants that come together for a common project.

This past summer while providing design services for a major furniture manufacturer in N.J. called Center Core I had the privilege of seeing such a business shrink and grow. The company was Systemhouse in New York City, a communications consulting firm that provides turnkey solutions for the integration of electronics and workstations   They were starting a project for New York Police Department to renovate 15,000 square feet of office space for over three hundred 911 call takers. The N.Y.P.D. space was not to be virtual but what I saw at system house was disturbing. My initial visit to their office accompanied by Center Core revealed an office of over 75 empty partitioned workspaces. The staff of less than 10 at Systemhouse mentioned that when they get a project the office is completely filled for a period of time. Projects range in time from a month to months to over a year. Upon completion of the project the offices are again empty.   The nature of work done requires only 20 percent of time for group interaction. This type of business would be prime for the virtual office. They are already in the communications/technology business. Consultants could work in remote locations and the result would be a drastic cut in real-estate costs in a prime location of N.Y.C.

Work force demographics also play into the changing landscape. A vast majority of workers must juggle work, family, social interaction, and a variety of other activities. The single parent who must care for the children perhaps needs a more flexible schedule. Being able to be free of the office and work at will is a liberating experience. This new breed of worker will have an effect not only on office landscape but on the home front as well. In white collar communities with a large portion of their work force not commuting the daytime adult population with increase two to three times. People working from their homes will become more active in their communities. They will do things from watching their children's little league games, to attending town meetings. Not only will they enjoy a better lifestyle but they will be more productive in their jobs do to the relief of commuting stress and their time spend working more focused.

CHAPTER 4

A NEW TYPE OF CORPORATION

The changes in work force will be directly linked to the changes in corporate structure. Over the years personnel in corporations such as IBM, General Motors,   and Sears have grown by the thousands.   With this growth we have seen the increase in unnecessary levels of management and corporate structure that has put a stranglehold on business and being able to stay ahead of change. As a result we see these companies falling victim to their own bureaucracies, as well as to changing business conditions that favored smaller more streamlined organizations. The virtual office concept will help to eliminate such beauracracy since its focus is to analyze a structure before allocating space to it.   This is evident with Chiat/Day Corporation, an advertising agency who recently converted their headquarters in Venice, California to a full blown virtual office. In his campaign against hierarchy,   Jay Chiat, the chairman of the noted firm says,   The private office is more a symbol of success than a practical tool." By eliminating personal workspaces, Chiat not only expects to nullify gradations of power among employees but also to blur the boundaries between employees and clients." [5] It **is** evident that the global recession has played a role in

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5Metropolis, October 1993

the way organizations have been restructured.   Some analysts have proposed flatter more matrix management strategies.   William Davidow and Michael Malone propose creating ad hoc alliances, or virtual corporations composed of talent from numerous companies.   In **his book,** The Ages of Unreason,   Charles **Handy** characterizes the fragmenting and scattering of **organizations by** the **beginning** of the 21st century.   **He predicts** less than half the **work** force will be employed **full time.**   The reason for the shift is the tripartite **shamrock** organization, in which a small core of essential **executives** and full time workers is augmented **by** outside contractors and part-time help.   The contractors will be **like free** agents and will **be** free to roam from project to project.   "This is not a **new** way of organizing **things,"** **handy explains. "What is new is** the growth of this **way o**f organizing in big businesses and in the institutions of the public sector.   All organizations will soon be **shamrock** organizations." Alongside the emerging **shamrock** **organization, Handy** describes the gradual development of the federal organization, **in** which a variety of individual **groups are** allied under a **common** flag **with** some shared **identity. "Federalism** seeks to **make it big by** keeping it small," he writes. "It is the method which **businesses** are slowly, and painfully, evolving for getting the best of **both** worlds, the **size which gives them** clout in the marketplace, as well as the economies

of scale, and the small unit size which gives them the flexibility they need, as well as the sense of community for which individuals increasingly hanker."

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[6]Handy, Charles, "The Age of Unreason"

CHAPTER 5

TECHNOLOGY IS KEY

Technological advances in computers and communications equipment have radically transformed the way people do business. Strides made in this arena have made it possible for all the changes we have previously discussed to take place. The personal computer is an amazing tool. I see an analogy between the shrinking computer and the shrinking office. Computers once as big as rooms now fit into your palm. Eventually they will become background devices indistinguishable to the human eye.   A new interface will be created that eliminates laborious keyboard and mouse commands. As we approach these changes the office will also become background. We will navigate through time and data unlike never before. Today the technology in place gives insight to this future. Software companies such as Picture Tel and Compression Labs, Inc. are busy creating programs that will enhance virtual office technology and have made significant strides in pictures phones and desk top video for the personal computer (figure 5).   By providing access to digitized information, from text to video images, the PC and it's monitor will play a major role in the growth of the virtual workplace.
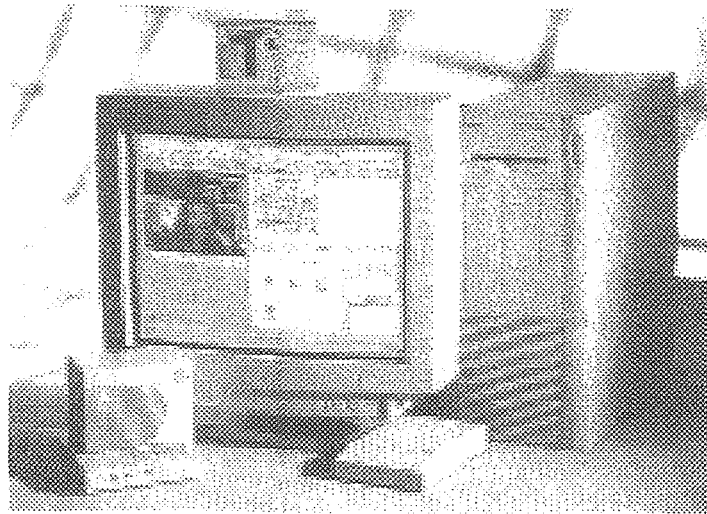
FIGURE 5 A P.C. Window with tele-conferencing

Groupware software, which has allowed the practice of group work and teamwork I spoke of earlier, currently allows remote linkages for work on spread sheets, data-bases, engineering applications and more.   Modems E-Mail, CD-Rom, tele-conferencing, muti-media and services such as America On-line, Prodigy, and the Internet allow individuals to converse with each other even on a real time basis. Smart peripherals will bring us the personnel assistant that will live in our computer and converse with other personnel assistants. These devices will arrange meetings, schedule appointments, and handle other mundane chores. With the advent of the Information SuperHighway we will be able to cross link between various networks (figure 6). This will make it easy to do business around the world, with connection to remote offices in different time zones. Information and the transfer of it is the key here.   In the next century I feel there will two classes of people. The information

haves, and the information have-nots.   The information haves, or knowledge workers,   will have access to a wealth of databases and global information   to use for business, education, and pleasure. Before this can happen there must be a **new** infrastructure in place   that can handle this exchange of on demand **data**. Parts   **of this** country are already being rewired **with**   fiber-optics to handle this capacity.
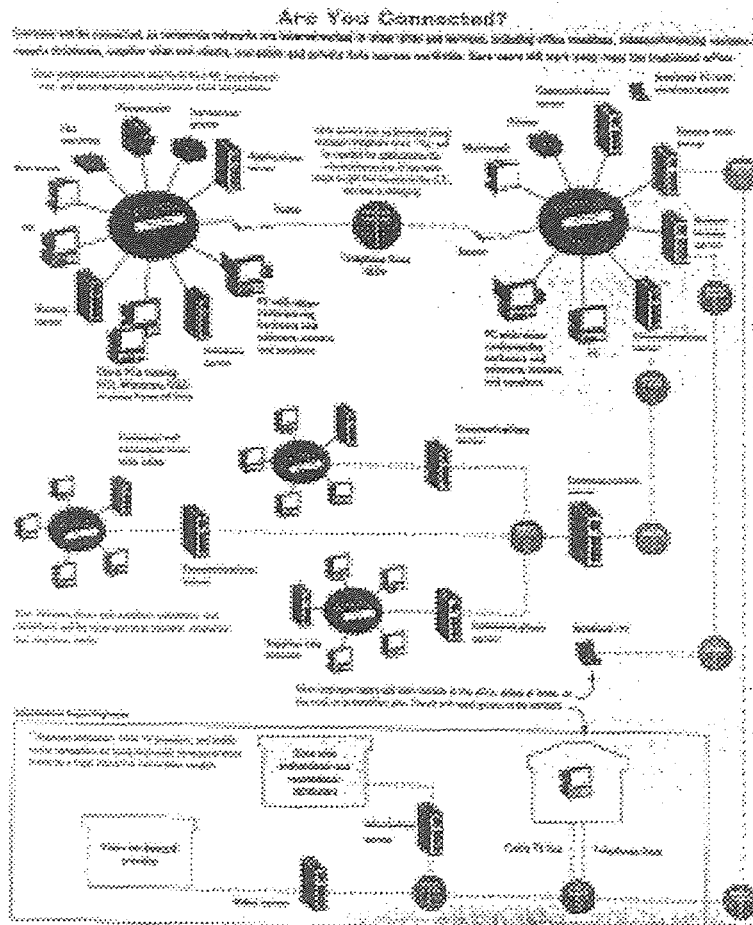

FIGURE 6 Diagram **showing Network Linkages**

Computers, data storage, data transmission, and software must all move to **a new** level in order to support this

trend. There is no reason it won't since we have seen the improvements in the last 10 years. What will the next ten years hold? In business, it is will mean a paper-less office. One that can be flexible and stay ahead of change. It will be on-line and have no boundaries. It will be a virtual office.

With the change in technology comes a fundamental change in the systems that house them. Office furniture systems have come a long way since the simple wooden desk and chair. We have since seen furniture becoming more modular. Partitional systems such as Herman Miller have taken into account wiring and technology with emphasis on ergonomics, lighting, and storage. Steelcase is developing new products to support common workplaces and tele-commuting facilities. We will see an increase not just toward modular but mobile. Mobile pods that act as private workspaces could be moved and arranged as needed within an open space. Usually when configured there juxtaposition will allow for residual space to be used as common area (figure 7). We will see an overall downsizing of units. Even traditional desks will become smaller and more adapted to technology   Computers and systems will become one with the furnishings.

At Center Core they have patented systems that provide fresh air output per each workstation as well as full integration between fiber-optic, phone, fax, cable other devices. Their approach is to make their product

line as flexible as possible in order to stay on top of changes   in the market and provide the customer with the latest innovations.
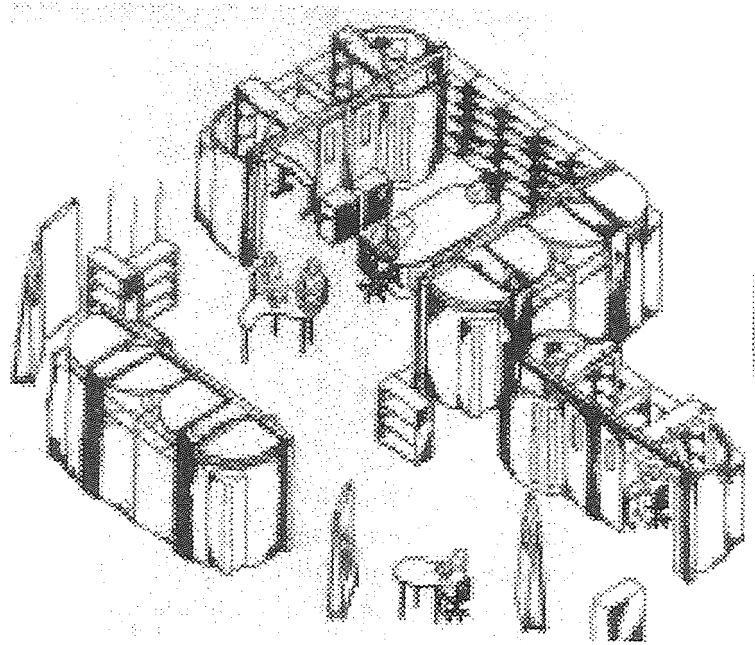
FIGURE 7 Mobile Work Pod Arrangement

CHAPTER 6

LEARNING BY EXAMPLE

Corporate downsizing, work force and corporate structure change, technological advances, and change to a information service based society all have led to the need for a redefinition of the office.   The virtual office is not a place but a non-place.   It can be physical as well as virtual.   One can understand the idea of a virtual environment very simply be working on a personal computer.   Think of your screen as a desktop on which you write notes and letters.   This desktop is littered with files and documents.   You are connected to the outside world through a communications device such as a modem.   Electronic mail is delivered to your office as you take time away from work to enjoy a game of video golf. The scenario described mimics a non electronic traditional office of years ago but is totally virtual and accessed through your personal computer.   With laptop computers, this virtual world is on the go.   It can be accessed from home,   in the car,   at a clients office or on the beach. Wherever you have access to the technology you can access the virtual world. Service industries such as accounting, banks, and law firms are prime movers toward reducing space.   Major corporations as well are aggressively seeking the technology to stay competitive. For this reason AT&T Network systems

contacted Hinrich Oltmann and Associates of Denville, N.J. who has been a pioneer in virtual office technology. My many conversations with Heinrich Oltmann allowed me to become familiar with the process that he created in order to achieve the goals set forth by AT&T.   When AT&T Network Systems realized it's existing 72,000 sq. ft. of office space was under-utilized by its staff, many of which spend 3-4 days a week in the field, they asked Oltmann to design and oversee construction of a totally new kind of office. "Today there is a fine line, if any, between tele-commuting and the virtual office," says Oltmann, but for it to be successful it has to go beyond the account executives. The whole corporate structure must be tied into it. Otlmann says the virtual office also must shed the negative connotations of the   home-based business.   "The idea behind a virtual office is that you are bringing your office to the customer. That whole concept is a reversal of the notion that you are working in your pajamas at home." AT&T's plan was part of many changes to the Networking Systems Division.   The organization wanted to shed the old image of AT&T and it's way of conducting business and become more responsive to the customer, a more streamlined organization, more efficient and therefore more profitable. Oltmann began the project by creating a virtual office program, and then designed the office space around the program.   The firm then held intensive

dialogues with all levels of staff to determine how the office would function, hypothetical space allotments, furniture, color schemes, etc.. The office was designed to support a core staff of 50 and a tele-commuting staff off 100 skilled professionals. The location of the new office was critical and was centered on the transportation hubs of New York City and the commuting patterns of the employees. Through careful analysis, Oltmann was able to reduce the space requirements to 26,500 square feet. If you were to calculate that out with today's cost for square footage in New York you would realize a savings of 1.3 million dollars per year rent. The startup cost are very high considering equipment, moves, new leases, and of course consulting fees, but AT&T Operations Manager Joseph Rubulotta foresees the division breaking even within 2 years. Their virtual office offers extensive conference and meeting rooms equipped with state of the art voice, video, and data systems. The complex is divided into eight functional areas, including a time-sharing area meant to recreate an office bonding environment for the tele-commuters. Since opening the virtual office, AT&T has realized a 60 percent savings in rent and was able to consolidate three older facilities into one. Oltmann sees working electronically as an acquired skill and envisions a use for the glut of office space leftover from the building boom of the eighties. He has joined

with AT&T to propose to owners of empty office buildings to convert them into virtual office commuting centers. These tele-business centers as they are also known are instant offices that can house workers for one to two **days** at a time. He sees this as especially effective for buildings located near major corporations. The idea **is** if some companies are reluctant to convert there space **they** can try out the commuting centers to **see** if this meets their needs. "Corporations must keep the headquarters in the cities for the **banks and global** access. But they can also keep the **work** force remote, especially those who don't require constant supervision." [7] Besides the AT&T projects which he says will **be** expanded to other divisions , he is currently meeting with officials in the Austrian Government to act as a consultant for a virtual reality facility to be built in Austria for medical and biological research.

Another success story has been the accounting firm of Ernst & **Young** in Chicago. **It** reduced its space **by 20** percent **when** it **took away** offices from **500 employees** and consolidated three smaller locations. **By** adopting **this** program the focus is to get the employee out to the customer. **Not** only can a savings be realized **in** real-estate costs but also the benefits of getting **the** employee out to the **customer can most** certainly increase revenue. Savings in real estate costs and customer

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[7]lnterview, Heinrich Oltman Architect

interaction are not the only reasons to consider a switch to a new type of office. This is never more evident than with Chiat/Day. The agency has been testing a pilot program in which 40 of it's employees are taking part in s V.O. program.   The employees are issued laptop computers and cellular phones and are basically pushed out the door of the agency's headquarters.   From there they are mobile.   They are not only removed from the office but are free to work whenever they need to in order to fulfill the requirements of their position. One such employee of Chiat/Day Peggy Roswell describes the experience,   "I have a feeling now that it is no longer my life fitting into my work but my work fitting into my life. The whole virtual-office process is about responsibility, It's like going from high school to college where no one is around to make sure you go to class."   She finds herself working in her car, at home, in the lobby of a clients office.   The physical world of Chiat/Day is a building designed by Frank Gehry in 1991. It is here that the merging of virtual and physical work place takes place.   Two Los Angeles based Architect's Paul Lubowicki and Susan Lanier were commissioned to convert the entire space to accommodate for a full virtual work force of 325 employees. The switch to V.0 was not simply a way to save on rent or space but grew out of a desire by the agency's president to create a forum for creative thinking.   The model Lubowicki and

Lanier chose for the organization of the physical space was that of a college campus or student center. Project rooms were designed like classrooms and a media center was incorporated as a reference library. The facility can be used by the employees when they need to but none of them have a permanent desk or office. Small incubator spaces serve as transient like workstations.
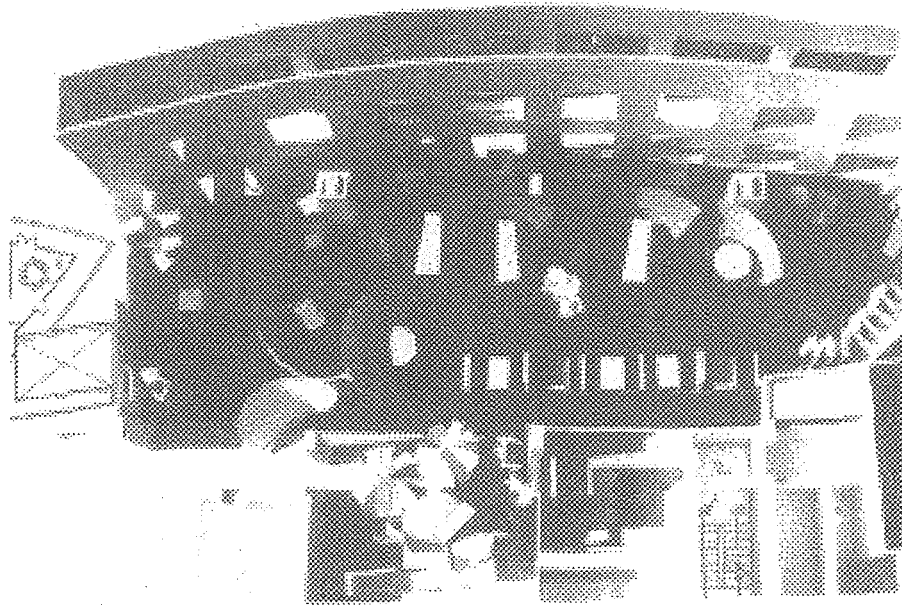

FIGURE 8 Chiat/Day Headquarters Venice, CA

Upon entering the facility Ms. Roswell registers for a workspace and phone. She is not limited to working in just the workspaces however. Unique spaces such as the so called "flop room" (figure 8) where she can work lying down, or the "crow's nest" which resembles a high tech college rathskellar are available at all times. The new

layout, is intended to breakdown the client/employee boundary and to make the work environment more comfortable and conducive to the work force as we approach the **next** century.   The easiest way to form a virtual corporation is by an alliance of current companies. AutoDesk, the industry leader in computer aided design software has started the **Virtual** Corporation Partner Program.   The virtual corporation is **the**   company's global network of partners numbering more than 2,000 third party developers, **4,200** resellers, **and 750** authorized training centers, all leveraging each other's strength's and providing services and support to the 2.5 million users of Autodesk products.   The software   partners provide customers with specialized solutions   that AutoDesk could not profitably develop **and** deliver.   Thus the **corporation has** a broad product range able to ensure custom solutions and services.

CHAPTER 7

WHAT ABOUT DESIGN

Today's virtual workplace has a tremendous impact on
architecture and the way buildings are constructed. New
office space has to take on a totally different character
to respond to the changing type of business. "These
offices must accommodate the much wider variety of space
types needed by vertically integrated and team-based
organizations.   They need offices of course, but
intermixed with spaces for training; laboratories;
workshops; showrooms; media studio's, research and
development; productions.... And to accommodate both
global business hours and extended "normal" hours, people
must have access to late-night food and a range of off-
hours amenity spaces and services... either in-building
or nearby." [8] Most of the design work being done in
this area is in the renovation of existing facilities.
Even on some occasions buildings less than 2 years old
have been gutted and renovated.   Chris McGoff is
president of Group Decision Support Systems, a company
that specializes in designing virtual meeting rooms. He
sees the virtual layout as a fundamental change from the
way architect's think today. He explains, "My company has
to constantly go in and retrofit buildings, Architect's
still see the conference room as a twenty by twenty or

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[8]New York Times, October 1993

thirty by thirty foot room with tables in the middle and chairs.   That metaphor is gone.   What we need now is a better sensitivity to large-screen presentation space and substantial power requirements. Were constantly tearing apart space in brand new buildings because they didn't accommodate the information technology platforms. We are going to have to start designing buildings around what people do with their information technology." [9] The challenge will be for the Architect to create an illusion with the design.   McGoff feels that with the right camera angles and properly constructed furniture if will be possible to have participants across the globe hold a meeting around what is perceived as one round virtual conference table.

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[9]Chicago Tribune, Offices Shrinking to fit needs of the 90's"

CHAPTER 8

BOLDLY GO WHERE

AT&T, Earnst & Young, Chiat/Day, these are all viable examples to the benefits of the virtual office and what it could do for business today. Architects such as Heinrich Oltmann, and Lanier/Lubrowski are innovators in this trend toward a free flowing type of planning and design for the once rigid corporate floor plate. Both Architect's realize however that they are just scratching the surface when it comes to the technology. The next logical step for this idea is the incorporation of Virtual Reality.

AutoDesk has been experimenting with what they call the Virtual Reality Toolkit and is actively developing practical applications for the technology. Skeptics may say that it will be 20 years before Virtual Reality will gain mainstream acceptance into today's business culture, but with the nature of change in the computer industry that number could be slashed in half. Richard Mascitti, director of development for Autodesk's Multimedia Division says the purpose of V.R. is to create a model in a computer and then add simulation to that model, taking it one step beyond a typical CAD drawing. The simulation provides new viewpoints and the ability to view underlying structure of the model that is being created. Mascitti goes on to say that VR will take two

forms when it is implemented in the commercial marketplace. The first will be animated simulations of three-dimensional worlds viewed on a computer monitor. In the second form participants will feel as though they are actually in the space that is being projected around them.   This is thought of mostly as the fictitious holodeck in the star-trek series. It is possible today to enter a virtual world as on the holodeck but the graphics and cumbersome glove and mask interface seem to muddy the experience.

This form of VR was utilized to correct a design flaw before a project was even built.   When the University of North Carolina was building Sitterson Hall, a research facility, scientists became involved with designing their office's and decided to simulate on the computer the experience of living in the building before it existed. The multi-million dollar building was first created electronically from the architect's plans into a full scale 3d-model. When people began to walk through the model many of them experienced that a particular area of the lobby created a cramped feeling in a busy hallway. The architects were skeptical but after experiencing the 3d simulation they agreed to make the change to the design before the building was constructed. It is this form of VR that will have a profound impact on the way spaces are designed and open up possibilities for the creation of new types of spaces. For Architects it will

become an opportunity, an opportunity to explore a whole new world of space relationships, design, and culture. This opportunity **will** be spawned by the creation **of** virtual environments called "Cyberspace".

"Cyberspace is a globally networked, computer-sustained, computer-accessed, and computer generated, multidimensional, artificial, or virtual reality. In this reality in which every computer is a window, seen or heard objects are neither physical nor, necessarily, representations of physical objects but are, in form character and action, made up of data, of pure information. This information derives in part from the operations of the natural, physical world, but for the most part it derives **from** the immense traffic of information that constitute human enterprise in science, art, business, **and** culture." [10] **While Cyberspace will** transform business and communications beyond **2000 it** will profoundly affect the practice of architecture as we know it today. Virtual and physical environments will overlap and the Architect will be **instrumental** in the harmonious combination of the two. Michael **Benedikt,** professor of Architecture at the **University** of Texas at Austin and editor of the **book** Cyberspace First Steps says, " The **door** to cyberspace is open, and I believe that poetically **and scientifically** minded architects can and will step **through it** in significant numbers. For

10Benedikt, Michael. Cyberspace First Steps, The MIT Press, page 225.

cyberspace will require constant planning and organization. The structures proliferating within it will require design, and the people who **design** these structures will be called Cyber-Architects. Theirs will be the task of visualizing **the** intrinsically non physical and giving inhabitable visible form to society's most intricate abstractions, processes, and organisms of **information**. And all the while such designers **will** be realizing in a virtual **world many** vital aspects of the physical **world,** in particular those orderings and pleasures that have always belonged to architecture." 11 One will be able to experience sound, touch , and real-time graphics. The physical world will be **masked** out **and you** be in cyberspace. Cyberspace therefore is about a **space that we** enter and since architecture is fundamentally the art of space it is logical to say that there **is** architecture within cyberspace and it cannot function without it. The architecture **will** be one of freedom. Free from the constraints of modern construction methods. Free from the **undesirable** elements of mother nature. Perhaps realizing an idea from Grooius **back** in 1919, to build in the imagination, unconcerned about **technical** difficulties. William J. Mitchell, dean of the **school** of Architecture at **M.I.T.** has **been** instrumental in the study and advancement of the architecture of cyberspace. He suggests, **The de**

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¹¹Benedikt, page 18.

materialization inherent in this technology extrapolates the dreams of the old modernists far beyond anything that could be achieved with the sparest of steel structures or the most transparent **of** curtain walls. Finally, it is possible to create an architecture of nothing but space and light.   An architecture from which weight and substance have been eliminated entirel   12

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[12]Architecture. B.P.I. Communications, New York, N.Y. page 40.

CHAPTER 9

THE CYBERSPACE CORPORATION

What would it be like to experience such architecture.
Lets take a look at the effects on the corporation with
use of Cyberpsace. The employees utilizing such a tool
could enter a true three dimensional virtual world and be
able to accomplish all of the things they previously did
while working in a row of physical offices while being
free of their surroundings. This could open up fantastic
opportunities to remove the need for even regional
proximity and face to face meetings at all. A team of
software engineers from around the globe could work side
by side in this world created solely for that purpose.
It need not be a pure representations of the former
physical environment but a new form of space. One that
will offer all the tools necessary to make the virtual
world self sufficient. Steve Pruitt and Tom Barrett give
insight into the what they call the Corporate Virtual
Workspace (CVW). They talk about the CVW scenario in
which a 45 year old software engineer name Austin Curry
who works for a worldwide software services corporation,
(lets call it CyberSoft), experiences cyberspace.   It
begins with Austin awakening at 6:00 which I find amusing
since this seams to resemble a normal awakening time to
go to work. He has a morning cup of coffee and lets his
dog out onto the back porch .   He skips the customary

morning shower   to get right to work. For years he has driven each morning to the train station to commute to work but know he walks to hi**s** study to begin his workday. He dons the special equipment needed to enter his personal workspace or (PVW) and links into his CVW via **a** fiber optic line. Austin if very bright and his career has spanned 20 years in which he has worked globally in seven different CVW's. His current environment utilizes the familiar office building paradigm as a model similar to the campus model **we** saw earlier with Chiat/Day. The main difference is that this environment is totally digital, totally **virtual**. Austin has never seen the main corporate (physical office) for this CVW which has over 2000 employees. As he enters the CVW he sees a vast network of interconnected corridors. His office is #16 **in** the **red** hallway which to other users appears as just another incubator space. Although **his** office **may appear** as **that** of a physical corporate office on the outside, on the inside it is much different. From his window he can view down 30 feet into 3 other corridors that all converge upon one another. His corridor contains PVW's **for** software engineers around the globe **with** exemplary backgrounds in CAD/CAM, interface design, and networking. Another **corridor** contains PVW's for consultants around the globe who are available when needed. Meeting can be arranged within a 2 hour time **frame.**   To increase productivity he has screened out all but 20 offices or

PVW's that he needs to interact with thereby eliminating the other users and the distractions that they could bring.   A third corridor is for client space. This corridor can be vast since the corporation deals with hundreds of firms and each is represented along the corridor.   Austin has restricted his view of this corridor to a small group of PVW's from Corporation XYZ. The security **is** tight **and** the clients only have access to their own corridor as well as Austin**'s**.   The corridors contain hypermedia bulletin boards much like traditional corporate bulletin boards which are rendered invisible to clients thus making their image of the **CVW** much smaller than Austins.   Conference rooms are readily available **for** use and are equipped **with** 3 dimensional drawing and painting tools that are used on infinite expanse of wall as **were chalkboards** used in **the** physical office.   The meeting organizer can quickly customize the size and configuration of the conference room as to their requirements.   The last corridor   (by his choosing) **in** Austin's view is one that contains various resource centers containing   **information**   on almost anything **imaginable.** These centers **contain** information which **is** vital to the software engineers.   The data is stored as **mini** cyberspace experiences that the user can enter **and** interact with.   Since all of **this** is taking place in computer form it can be saved and played back whenever necessary. Consider this like the bolo-deck in the Star-

Trek series when a simple "computer save program" phrase freezes the current **3** dimensional virtual world **to** be **experienced** over again or **to** be continued. As you might have guessed Austin has restricted **his** view to only those relating to his project   Back at his PVW Austin checks his virtual mail to see his manager has requested he evaluate the resume of a young software designer who has **expressed** a desire to join the group.   The interface in this particular environment take the form of a control panel at eye **level.**   **It** is here that Austin can **control** the dials and switches to filter out all **but** the most pertinent **external stimuli.**   With another switch he temporarily switches his view to his physical surroundings in order to relocate his misplaced cup **o**f coffee.   He is **now** ready for the resume which unlike the boring hard copy ones we are **familiar with** is a exciting **multi-media** presentation that **takes** full advantage of cyberspace.   **Austin** filters through most **of the data but** is intrigued by the individuals work on object oriented graphics.   **Unable** to resist he enters the **demonstration and** interacts with it **for 15** minutes. After leaving he then sends a favorable recommendation to his manager

The better **part** of his morning is use to interact **with other virtual** colleagues.   He has **never** met them physically since they are from **places like** Japan, Germany, and Brazil.   A meeting is scheduled with Johann Grumman who **has** an office on the red corridor **at # 84.**   Austin is

in a hurry so he gestures for the control panel to appear at eye level and toggles it to read PVW 84.   The control panel disappears and he is briskly moved down the corridor to PVW 84. Upon entering the office he sees a note saying that Johann has left his PVW to retrieve a glass of milk in his physical world and will return shortly. Looking around the office which is less spartan than his own he sees a mural that covers an entire wall. It is a panorama of El Capitan in California.   Johann is an avid mountain climber and the mural is thought to be at first a still image of one of his expeditions.   Upon closer inspection Austin see the leaves on the trees blowing and the group of 6 climbers slowly moving forward.   Gesturing the control panel he blows up the image of the hikers by 50 percent to view them ascending the mountain.   Just then Johann enter the PVW and tells Austin of his desire to join the other climbers after their meeting to alleviate stress and to clear his mind. Not wanting to keep his friend from his venture Austin decides to postpone their meeting to another time.   He returns to his own office and saves the mornings events. He leaves a note on his wall that he will be return in one hour. He intends to return to his physical environment to take a shower and have a little breakfast. As his removes the special apparatus he notices his dog scratching on the back door more than ready to come in from the porch.

The above scenario is obviously a futuristic account of what cyberspace will do for business in the next century. Today however, we see examples of virtual environments being created and tested. For instance, at M.I.T. a project has begun to construct a new architecture and urban planning studio which will serve as a laboratory for the design studio of the future. The project integrates advanced computer and telecommunications support to allow experimentation with new ways of providing access to knowledge, and new approaches to teaching. With the architectural and planning practice becoming more international most of the collaborative work is being done by teams in various geographic locations (figure 9).   With the help of geographically distributed computer networks such as the "internet" it is possible to perform this collaborative work while not being in the same office. The virtual studio will find a home in architectural firms which will be the physical home base where face to face meetings are held and all physical documents are kept. Many more access points are then provided by remote sites via computer modem hookup.

For virtual conferences, participant have a window on their computer workstation providing access to the current project being worked on, for instance, cad drawings or a 3d-model of a building, as well as windows for tele-conferencing with other individuals (figure 10).
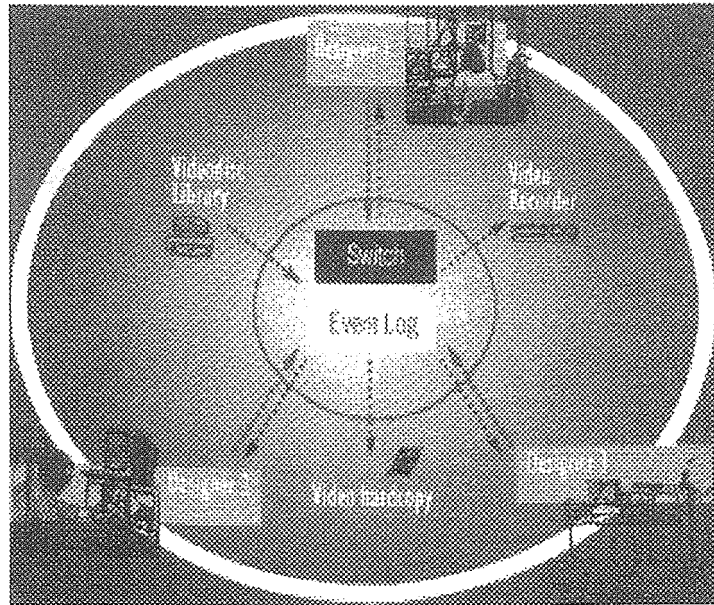
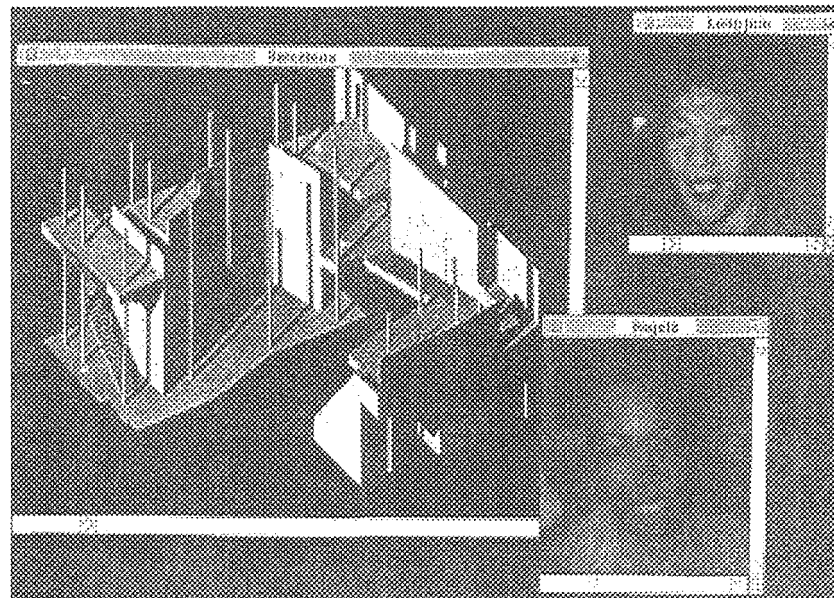FIGURE 9 Diagram for remote work sites

FIGURE 10 On-line virtual conference

The entire process will be electronic therefore
providing a complete record of transactions of the
meeting or a automated secretary that will make a video
record of all discussions and personal interactions of

the members. As far as the applications for teaching, all
of the traditional studio rituals will be on-line. The
desk-crits, pin-ups, model building, research and reviews
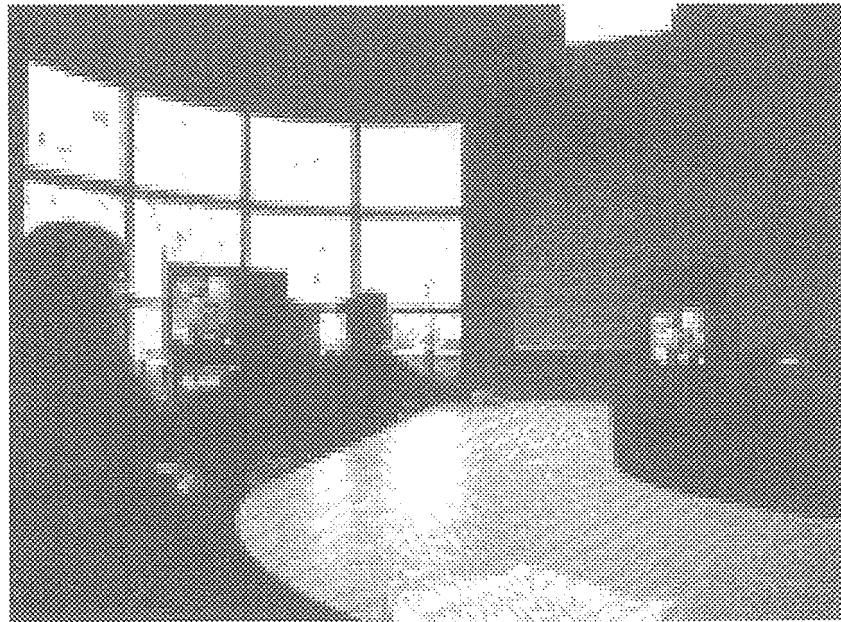will all be done electronically (figure 11).

FIGURE 11 An electronic pin-up review

This will allow for a much broader introduction to the
profession for students and provide them with the
opportunity to receive criticism from esteemed
professionals from around the globe regardless of the
obvious constraints of time location and travel.   Also,
the constraints of the box   or classroom can be
eliminated.   It could be possible to never physically
meet the studio critic or even inhabit a physical studio
space. The idea of site analysis could be discussed
with individuals at the proposed site as well as other

individuals who's disciplines are related to the building type proposed in the studio project. The boundaries set up for traditional private practice will be eliminated. Architects will not only help to design virtual worlds but will do so from within them.

CHAPTER 10

VIRTUAL CROSSROADS

There is no arguing that the virtual environments that I have discussed will minimize to a certain degree the need for designated physical space. Most building types such as libraries, banks, and theaters will eventually become mostly virtual, the challenge will be in the integration of the virtual space with the physical space and the underlying structure and interface of cyberspace.   To acknowledge the overall effects on a large scale we can turn to Mitchell who says,

"Cyberspace and urban space will overlay each other and interconnect in complex ways.   Construction of information superhighways and the cabling of dwellings will raise problems of how to provide equitable access to the new employment, education, information, and entertainment possibilities that result.   As more and more social interactions take place on the net, through bulletin board systems, in on line chat rooms, and in other such places, issues of how to form virtual communities and refashion a public realm will seam increasingly pressing.   At the same time, digital telecommunications and electronically mediated action at a distance will eliminate many of the locational imperatives that have defined architectural programs, urban land use, and transportation patterns of the past.

Cyberspace will re configure the uses of physical spaces and real time slots. It will lead to the disintegration of **many** traditional building types and recombination of the **remaining** pieces with computational devices, telecommunication networks, and software." **13**

The cyberspace interface itself will have much to do with searching and navigating through data. The virtual dimension need not be a replica or simulation of the physical world. The dimensions, **axis** and coordinates that we find **common** in such things **as** street maps and addresses will not necessarily be **the** same. It is easy for an architect to create a cyberspace simulation of **a** project that will be physically built. All **the doors**, windows, stairs, etc. will be in the same place as **will** be the finished product but most simulations will have a structure **geared toward** information and the **quickest way to access** and process this information. The form that **this** structure takes **can be a** project all its own. There may **be** infinite **ways of** getting **around** cyberspace, one can only imagine. An analogy **I** can make for better understanding is that of the so called worm **hole** concept found in **the** Star-Trek series'. On **any** given moment you are immersed in all the stimuli of a space and **time** continuum. By passing through the worm hole **you** have been transformed into another dimension. It **may be** **similar** to the experience's you just observed perhaps in

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13 Architecture. B.P.I. Communications, New York, N.Y. page 42

greater detail or it may be a whole new set of experiences and deeper still a whole new origin or history. These are the types of leaps one could make in cyberspace.

FIGURE 12 Stan George 1989 Urban Grid

The structure of the underlying data which might be called liquid architecture could take the form of an urban grid as visualized by Stan George in 1989 (figure 12). Also one might experience the space as a matrix of data cells as described by Daniel Wise in 1988 (figure 13). He displays what could be considered navigational data made accessible by placement of the crosshairs. The data cell in then opened (figure 14) to display images that one might wish to experience. The third image (figure 15) shows a closer look of the data.

The chain could end there but who says it has to . Each of these close up images could be a separate cyberspace that can be entered or experienced. The virtual office could be thought of as a matrix or a new corporate structure with each data cell containing past experiences or projects. It does not need to be as literal as the CVW we experienced with Austin.
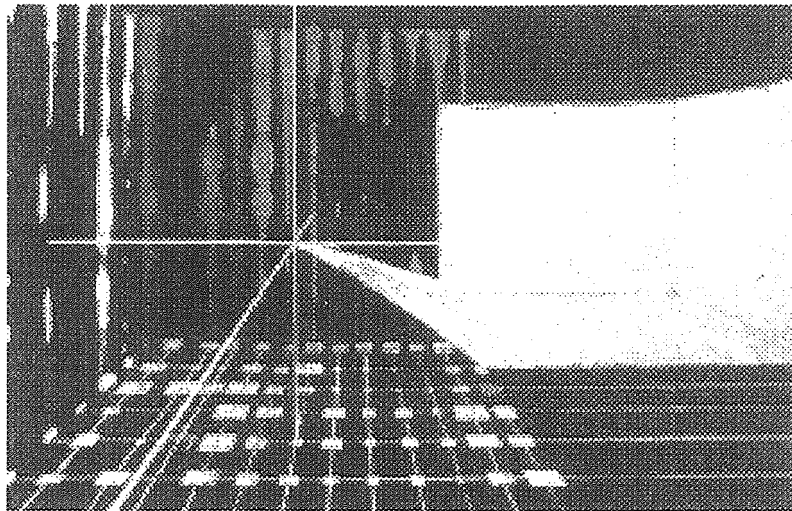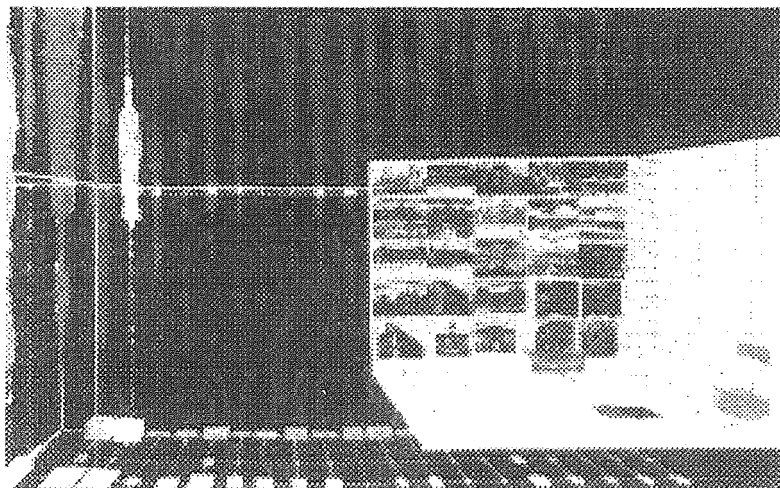

FIGURE 13 Daniel Wise 1988   Data Cell

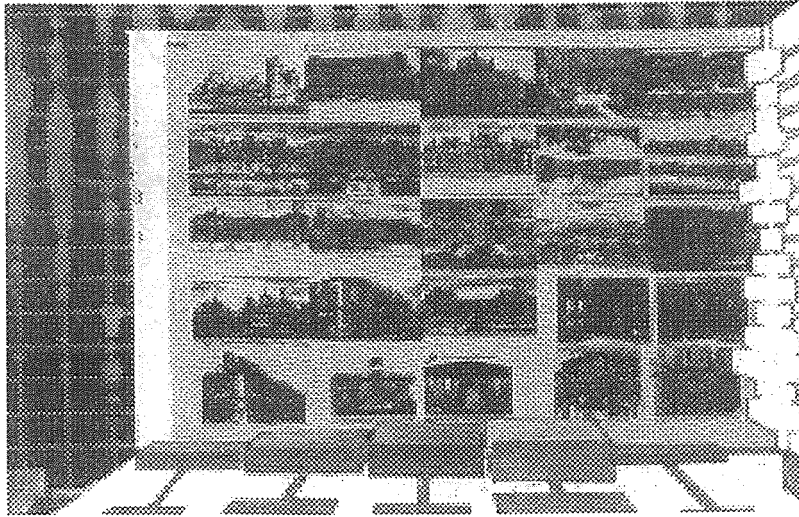FIGURE 14 A closer look at the data cell

FIGURE 15 Revealing the full data cell

The images here are not unlike those in which we dream. One may experience hundreds of dreams in one night but to me they seem to be a hybrid of images and thoughts. It is like you are familiar with what is out there even if what you see is not totally clear. You appear to float above what is happening. This will be the truly great experience of cyberspace for it is not just a physical freedom but your mind that will ultimately be free. To experience a matrix or grid as suggested by George will most certainly have a different meaning to all that experience it. On its onset the virtual office interface most likely will have a control panel (figure 16) that will guide you through select data fields. Related images pertaining to the information will appear in windows. These windows could become bridges to other data fields similar to the concept of the worm-hole.
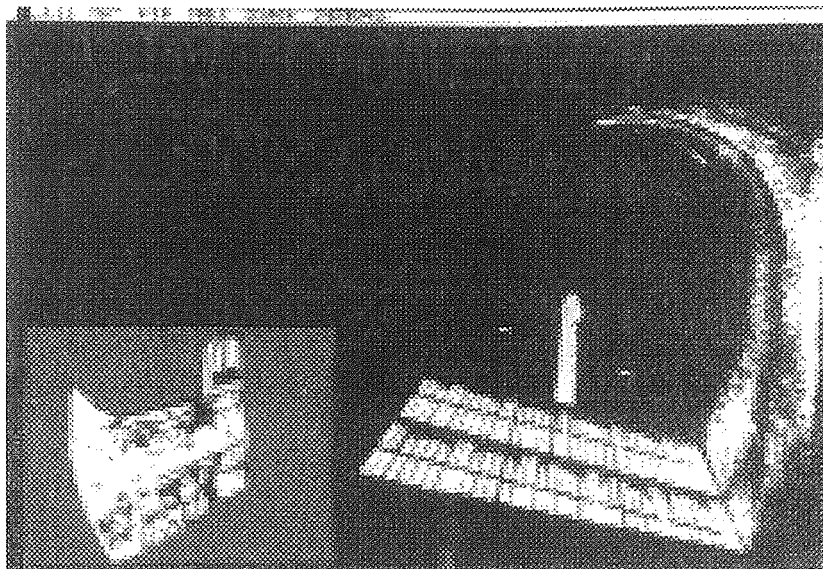
FIGURE 16 A control panel showing Ronchamp

The control panel will most likely work in conjunction with virtual spaces. Many control panels will overlay one another similar to my current computer screen in which I am typing in this text editor while another window displays the time and a third overlays that with graphic images I am using in this text.   A pure data based interface will appeal no doubt to the technical society but the masses will find it a bit cold and intimidating. After all, it will take some time for people to get familiarized with this new toy and that's just the way it needs to be portrayed. Remember computers of say 5 years ago when more than half the population was afraid to turn the darn thing on. The thought of that dreaded C:\> and the infinite darkness of DOS scared people away. Now we see these multi-media user friendly machines that make computing fun.   The masses have become hooked on CD-ROM applications and mentioned the word inter-activity and

they go crazy.   This form of entertainment needs to be incorporated into the virtual interface even if it is used primarily for business applications.   There will undoubtedly be many interfaces that are created just as there are many different styles of architecture and methods of construction. Each interface will be tailored toward the user and the ways in which they wish to utilize this medium.   Regardless, the architecture will be one that realizes no restrictions.

CHAPTER 11

WILL I STILL BE ABLE TO

This architecture of light and impulse will affect both
the employees and corporations as tele-commuting or the
virtual office does today.   For the individual,
cyberspace will allow total freedom from time and space
requirements, this means you will be able to physically
link up as easily as it is to call someone on the
telephone today.   Imagine retrieving messages from your
answering machine and having them be full 3d interactive
experiences.   An employee's PVW will be their greatest
asset.   A multi-media resume of past projects and
performance.   Their will be no sugar-coated resumes in
cyber-space. Cyberspace workers will have tremendous job
mobility and changing jobs will be simple as will the
opportunities for entrepreneurial endeavors.   Through
linkages from virtual educational institutions, access to
education will make our entire society more intelligent.
It is difficult in the current society to try and attend
work and school concurrently. Many have tried it and
have succeeded, but the vast majority can not make the
commitments do to time and area constraints. Once again,
with the freedom from location employees can lead more
relaxed   lifestyles   away   from   congested   cities.
Corporations will also benefit beyond the savings in
real-estate as was the case with tele-commuting and the

virtual office.   Opportunities for a complete cyberspace corporation providing virtual services exist.   These corporations could be formed as projects arise, similar to System House, or exist permanently.   It will be easier to reach clients and markets that were previously unknown. New management and corporate structures will develop beyond those being experimented today with tele-commuting. Management will have a greater ability to oversee a corporations activities. Interactive sessions such as focus groups with customers will allow both to become more familiar with what type of products are needed. Engineers and product developers will get first hand responses that will improve overall quality . These sessions will give customers the ability to experiment with products and services on-line before deciding to purchase. The overall advantages are numerous. As you can see the topic of the paper can easily veer off similar to a cyberspace interface. Can all this really happen and was it started by the need for a new office. Obviously many factors have led us to this point, but to put it into better perspective one must realize that technology, corporate structure, and the nature of work led us to tele-commuting and the virtual office.   A continued outgrowth of those factors can only lead to cyberspace.

With all that I have discussed with regards to the history and future of the office, the question is. Where do we go from here?   There is obviously two avenues we

can pursue.   One being the concentration on the virtual office model today with an emphasis on corporate restructuring, employee satisfaction, and technology, with the other being an office environment in cyberspace such as CyberSoft.   I feel that a harmonious combination of the two is the best direction.   Consider a cyberspace environment that allows employees to enter this digital environment of virtual reality for use by whomever needs it along with a physical/virtual office facility for those whose jobs require more personal contact.   This arrangement is one that can be implemented today and take into account growth into the future. The idea is to stay ahead of change. With this is mind lets look at a design solution for such a corporation.

CHAPTER 12

A VIRTUAL OFFICE DESIGN

I am in a empty conference room. I walk around the podium
and find myself in a crowded chamber. The podium is gone, I
call forth a window, and in the distance see
the conference room leaving....

The Virtual Office extends the boundaries by which we
define architecture and the manipulation of space. The
design calls for a combined physical virtual corporate
headquarters for Smartech Inc. Smartech is a leader in
the design of communications and entertainment based
software products.   They employ over 1500 employees
worldwide with positions ranging from programmers to
salespeople to engineering consultants.   It is their
desire to replace an aging facility with a new state of
the art headquarters for it's 200 employees located in
South Florida.   The new facility will be designed as a
virtual office.   In addition, Smartech wishes to
incorporate a new technology (Cyberspace) into its
structure for use by their programmers and software
engineers.

12.1 SITE

As I have discussed, the site is crucial **when** locating a virtual office. After study of traffic patterns **and** location **of** existing infrastructure I **have** chosen a site on Sunrise **Blvd.** **which** is **on** the outskirts of the downtown commercial district of Ft. Lauderdale (figure 17).
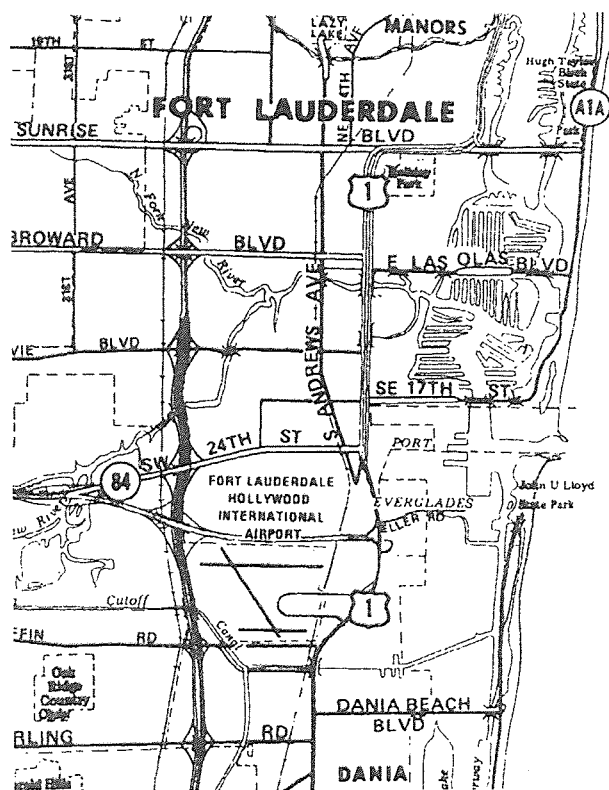

FIGURE 17 Location map of downtown area

This area **enjoys** all of the advantages of **downtown** without the higher cost of **property**. The location **is** strategically located between routes **95** and 1 for reach **by** automobile. Access to **Ft.** Lauderdale International Airport is **a** mere 10 minutes **away**. This ideal location

also has the convenience of being 2 blocks from a major tri-rail station. The tri-rail is a modern lite rail system that runs between Florida's major cities and along the southern coast. For individuals who need to get to the office it is extremely reliable and safe. The site is a corner lot bound on all sides by buildings with on-site parking provided in the rear (figure 18).
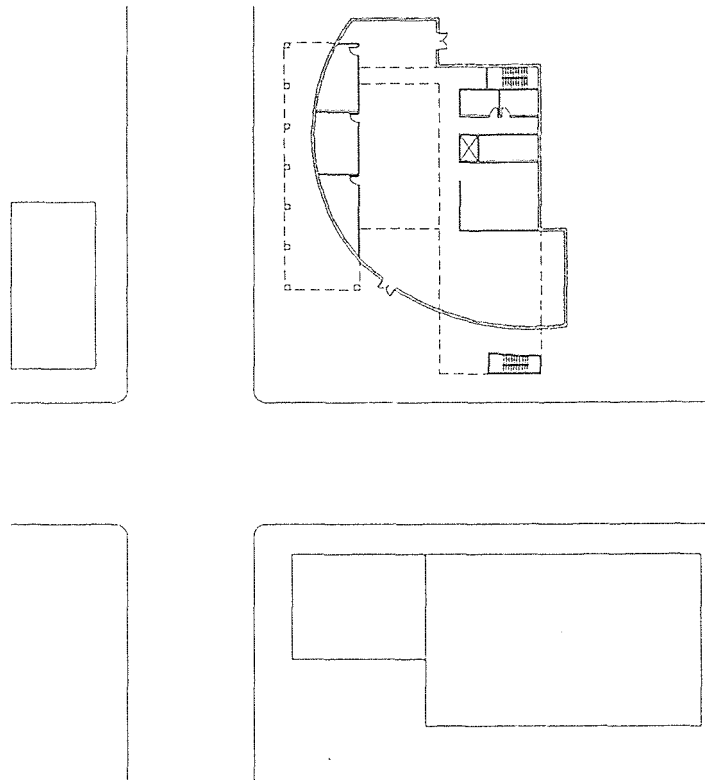
FIGURE 18 Keyplan of site showing location

12.2 DIAGRAMMATIC

The building is divided into three rectangular bays with
the center bay being a void. This void becomes the lobby
but also serves as software demonstration area for the
companies various products. The entire ground floor and
entry area is to be customer related (figure 19). The
reason for this is two-fold. The ground floor lobby area
is the first space seen upon entering the building.
Catering it toward the customer allows them to feel at
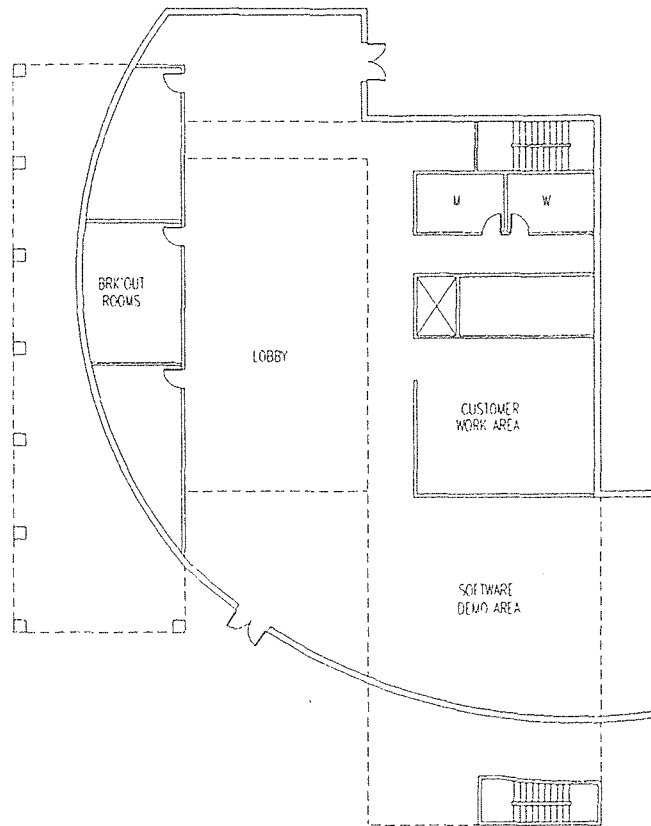home in your environment.

FIGURE 19 Ground level with customer area

Also, utilizing the lobby space as demo area saves
square footage and puts your products right up front in
a prime location. The demo area will be filled with

interactive computer displays that show off particular programs, products, and services that the company **offices**. The three breakout rooms located adjacent to the lobby provide for impromptu meeting **among** client groups **or** direct meeting with marketing and other staff. The **idea is to provide** everything necessary on this floor in a relatively small area to keep focus on **the** customer. **Also** provided on this floor is a customer **work** area. This is filled **with** workstations that are equipped with support for phone, **fax,** and computer modem to allow the customer an area **to** conduct their business while being part of yours. This way it is possible that **time** constraints are not a factor. The longer they stay **in** your building and become familiar with your products the more likely they are to conduct business with you. The sweeping arc forms an **outdoor** court on the corner lot **and** allows for an easy path **for pedestrians passing by.** Pedestrian traffic is just as important since the **demo also** doubles **as** a high tech display **for** individuals **who might be** interesting is seeing what will be available to them in **the** future. The 3 bays represent the structure of the **3 story box** building that **was previously** on the site. **Leaving the center bay open** allows for the transparency of the building from front to rear linking **both entrances and the parking to the** rear.

The **second** floor is primarily for sales and **marketing** personnel. Both floors **on** either side of the

void look down into the demo area. On the North side the
floor is partitioned of as incubator spaces for account
executives who are mostly on the road. There is capacity
for thirty individuals at one time each having an
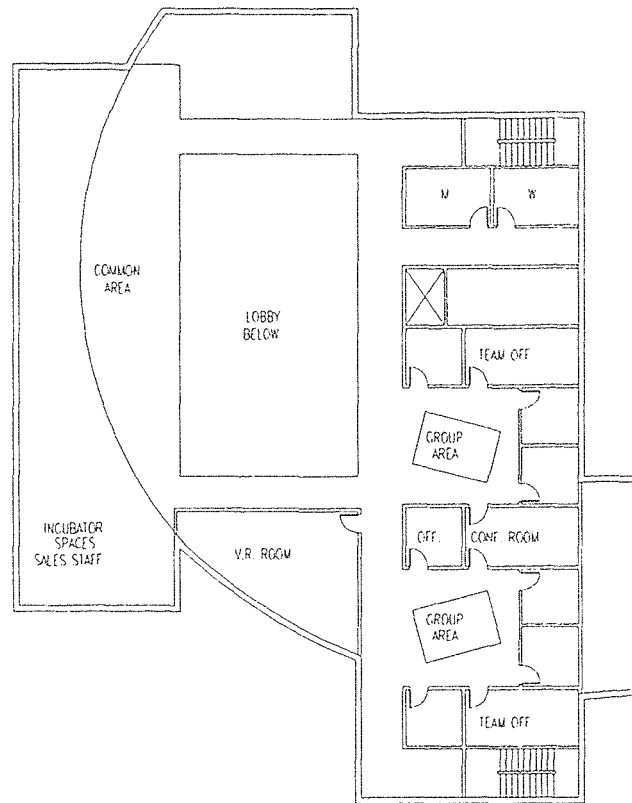autonomous workstation (figure 20).

FIGURE 20 Second level showing common area's

The North Wing also has a common area that takes the
form of the arc below. This common area is equipped with
loosely arranged seating for casual work and
leisure.   Clusters of seats   can be re configured as
needed for meetings and group work.

Communications ports are provided randomly throughout the space for linkages. In the South Wing **which has** connection to the sales area via bridges that cross **over** the lobby **is** the marketing staff. More traditional office space **is** provided along with a shared conference room for the **two** groups of staff that work closely together. A team room allows for multi-occupants working on specific tasks. **Group** areas are also provided to allow for more spontaneous and creative thinking amongst all staff members. This core group address is common throughout the building. Lets take a closer look at its functionality , besides **providing work** space **as** shown the group area can focus **toward** the south wall **where** display boards and other visual tools are displayed. Also, both wings have equal access to the main Virtual Reality Conference Room that takes a prominent location on the front facade. **The** conference room contains all the state of the art communications **and** peripheral devices to immerse **its** **users in** virtual conferences with any location around the globe.

The third level is the administrative and executive level. Contrary to traditional office design where the top brass get the top **floor** this is a more modest approach. Offices are arranged in the **group address** but the **group spaces** are utilized by administrative support

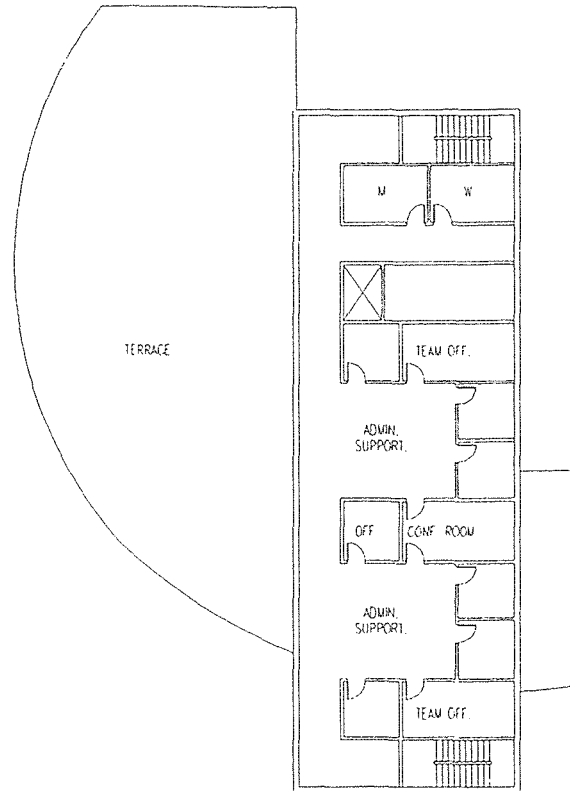personnel (figure 21). This level also has access to the roof terraces above the lobby and the North Wing.

FIGURE 21 Third level plan

The forth and fifth levels are reserved for the programmers and software engineers. The south wing or mini tower begins to poke fun of the downtown area showing a 5 story rectangular box from the outside but something very different on the inside. The creative minds behind there products benefit from individual, team, and group areas as well. The variation on these floors

is that the conference space is part of the group space and the central room functions as the cyber room with comfortable reclining couches for four individuals who need to don the special equipment needed to enter cyberspace (figure 22). The cyberspace devices provide the link between the programmers and other consulting engineers.
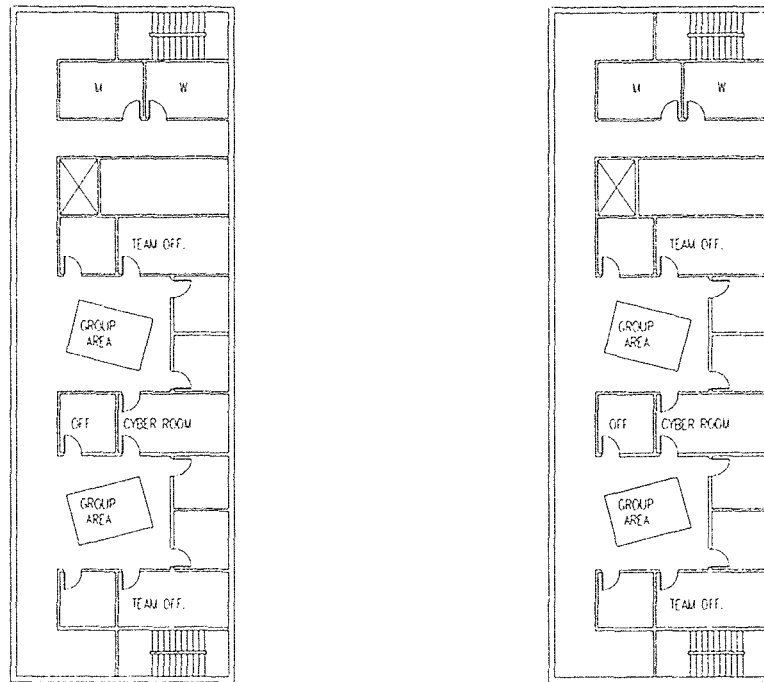
FIGURE 22 Upper level plans with cyber-rooms

12.3 CYBER-INTERFACE

The physical office space provided allows the programmers and other professionals to work both individually as well as in teams. Even so the nature of work at times reaches a point when the physical space is inadequate. The need for staff to communicate and interact with other locations pushes the limits of tele-conferencing. With this in mind a Cyberspace interface is needed in order for the staff to interact via virtual reality. The interface provided must be simple, easy to use, and portray as much data as possible in a clear format. have based this interface on a single architectural unit that in itself and in conjunction with another forms a bridge to another level or experience. This unit is the stair. The stair can portray many things, it can be seen as a path or a link of the past and future. Everyone knows the function of stairs. This makes the interface user friendly and not intimidating. In this cyberspace you will not actually walk the stairs but follow their direction to your intended goal or destination. The interface will appear to you as an overall maze of stairways, inspired by artist M.C. Esher, and cyber rooms (see figure 23 next page). The cyber rooms   are a variety of experiences from software simulations to meeting rooms to individual space. The crosshairs allow you to cursor in on the particular area you wish to experience. Once a desired destination is

chosen the   image in that window or door zooms to full screen. At particular times the bottom portion of the image will contain data displays relating to your project or tele-conference windows that allow you to communicate with   the real world. The data display can be toggled on or   off at will as well as take over the entire image if desired. Other users on the network can be seen as ghost images in different cyber rooms or on the various paths. They are known by their real world name but bear no resemblance to their physical presence. Remember this   is cyberspace and the form an individual takes can be anything.   I have chosen the ghost image because I feel that in cyberspace unlike real space, you should only be judged on your intellect and not your physical   appearance. The interface becomes the front-end to the actual cyber encounters.
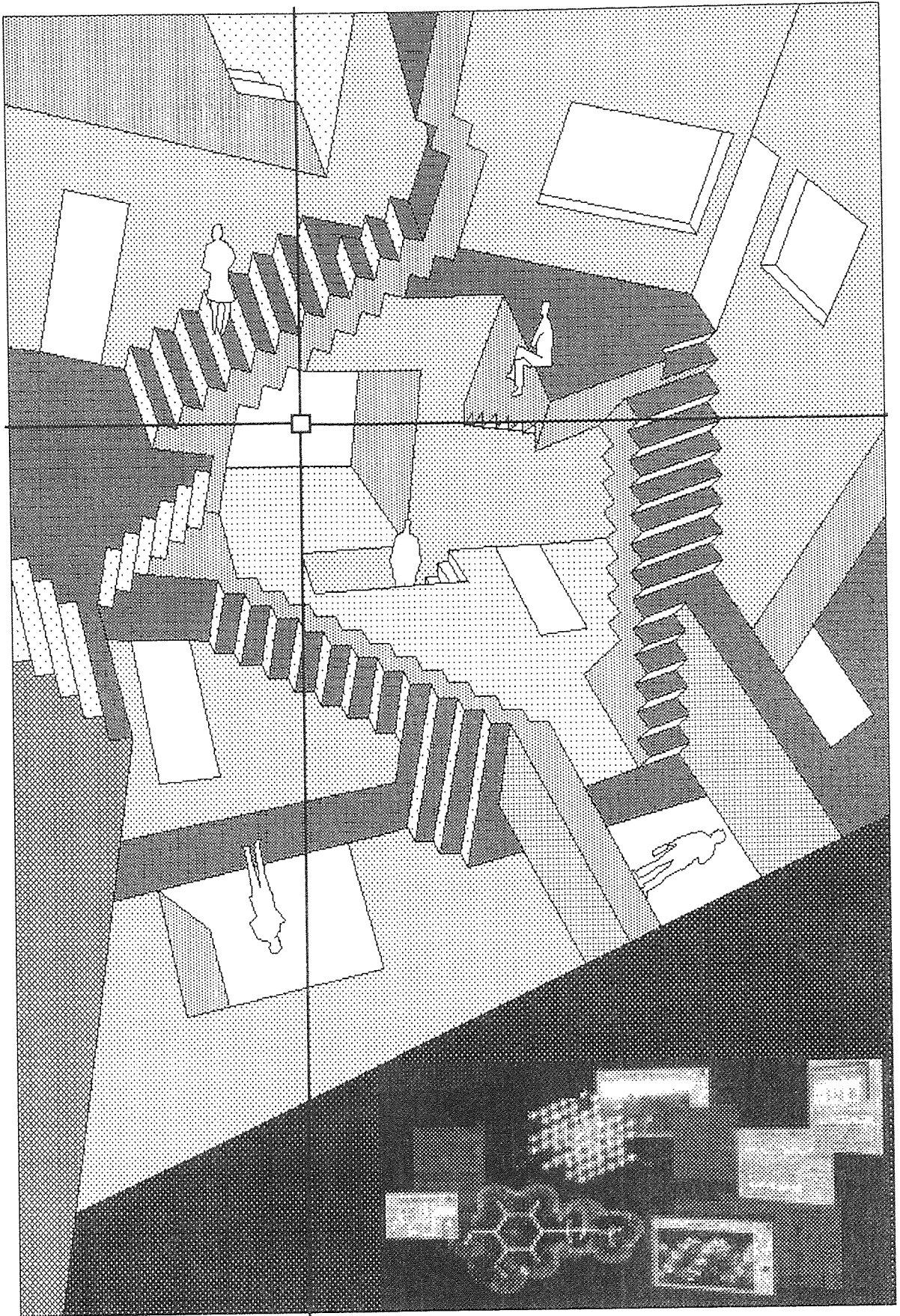
CHAPTER 14

AND FINALLY

"Less is More"   certainly an appropriate beginning and
ending.   With a need for less office space comes a
fundamental need for more advanced thinking, research,
and creativity in regards to virtual office designs and
prototypes. Cyberspace is not just a tool to aid in
visualization as is the cad system, it is much more.
The ability to immerse oneself in a truly digital world
is quite remarkable.   With the high speed growth of
technology making these worlds more realistic who better
to aid in their design than an Architect.

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