KINETIC PAINTING

HIGH-TECH KINETIC FINE ART

A FIELD PROJECT

Presented to the Graduate Division

College of Arts & Sciences

New Mexico Highlands University

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

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by

D. Moiré Thom

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DEDICATION

This field project is dedicated in loving memory to my mother. She was, and still remains, the only person that has ever believed in me.

ACKNOWLEDGMENTS

I would like to thank Dr. Bingham, for allowing me to develop this kinetic art form as my field project. Ulrich Niemeyer, creator of Visual Communication (formerly Design Foundation), has been instrumental in my early development in the media arts and in providing mentorship. Roger Salles, Instructional Technology Coordinator, has unselfishly shared his knowledge in video production and in providing mentorship toward the end completion of my field project. Margaret Franke, my former technical writing instructor, has been very helpful in checking my field project paper, and in providing me with reference books.

ABSTRACT

The purpose of this field project is to develop a kinetic art form. It is a kinetic art form in the realm of kinetic painting. The three types of kinetic painting are traditional-kinetic painting (hand painted by the artist), traditional-high-tech kinetic painting (a combination of hand painted and technology painted), and high-tech kinetic painting (technology painted). The type of kinetic painting that I am creating is traditional-high-tech kinetic painting. In order to give a concise explanation of traditional-high-tech kinetic painting, it must first be put into context of Kinetic Fine Art. There are three areas of Kinetic Fine Art, which is defined by the major evolving advances of technology within our modern times: machine, light, and computer. In order to separate these three areas of technology from the multitude of kinetic art forms that presently exist, these three areas of Kinetic Fine Art will be described as Machine Aesthetic, Light Aesthetic, and Computer Aesthetic.

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CHAPTER I: INTRODUCTION

In 1998, I wrote my first paper on the kinetic arts in a technical writing class. Before writing this field project paper, I read that former paper. It did not make any sense to me. Apparently, I had memorized and not internalized the research done previously. For this paper, I made a point to use my own words, and that required creating my own terminology. I ended up developing a whole new theory on the history of Kinetic Fine Art.

The background chapter is devoted to the history of Kinetic Fine Art. The objective for writing this history is to simplify the explanation of kinetic art. Kinetic art is often included in a discussion of technology art. This creates a blurring of lines between kinetic art and technology art. Not all kinetic art is technology art, and not all technology art is kinetic art. It is my intention to simplify kinetic art by separating some of the technology art from kinetic art, and by defining the categories of kinetic art. The first thing to do is to elevate the name kinetic art to Kinetic Fine Art. This elevation of terminology signifies that it pertains only to some form of motion: actual, virtual, or spectator. All other forms of motion fall under these three types of motion.

The elevation of terminology also signifies three categories under Kinetic Fine Art. The categories are Machine Aesthetic, Light Aesthetic, and Computer Aesthetic. Once in context, I describe the three types of kinetic painting. Thomas Wilfred the inventor of kinetic painting and Frank Malina the greatest kinetic painter of all time are both discussed. Illustrations are shown of their work and how they were built. Then I go into a complete description of the method I used to develop my type of kinetic painting. In the following chapters, I explain the results of my work, and a discussion of the implications with a conclusion.

The first time I heard of Frank Malina was in 1993. I had applied for a patent, at the end of 1992, for the “Kinetic Visual Display”, which eventually became “Santuario”. I had gambled away all my savings by applying for the patent. The lawyer said that with only one prior cited by the patent examiner, I still had a good chance for the patent. But all my money was spent. So I abandoned the patent. In 1993, I had moved from Maryland to New Mexico. I’m not sure if it was due to the disappointment of not getting the patent, or the new cultural surroundings, but I pulled the patched screens off the “Kinetic Visual Display”, reapplied new patches of screen, and then painted the “Santuario”. Since that time, I’ve been on a quest to upgrade my ability as a kinetic painter. All my work as a kinetic painter stopped until I could learn to use the computer and incorporate it into my work. The transition has taken ten years. This field project has given me a new enthusiasm to create and be a high-tech kinetic painter.

CHAPTER II: BACKGROUND

As a graduate student at Highlands University in Las Vegas, New Mexico, and majoring in Media Arts and Computer Science, I often wonder why so few people know of kinetic painting. What is it? They often say, or what is kinetic? By now everyone has at least seen, even if they don't know it, a kinetic sculpture. Usually it is in front of an important building and is driven by a motor, or it is wind driven, or it gives the impression of movement due to the shape and or reflective properties of the materials used in the art form. This is the presently accepted form of Kinetic Fine Art by the private business sectors, the government, and the general public. The Kinetic Fine Art form that this Field Project is concerned with is kinetic painting. In order to give a concise explanation of this art form, it must first be put into context. Although there are a multitude of kinetic art forms, there are only three categories of Kinetic Fine Art, and they all coincide with the major technological advances of our modern times.

The three major technological areas of advances are within the realms of machine, light and computer. These realms of technology also constitute the three categories in Kinetic Fine Art: Machine Aesthetic, Light Aesthetic, and Computer Aesthetic. These terms do not replace machine art, light art, or computer art, or even kinetic art, but are a necessary elevation of terms in order to give a concise explanation of Kinetic Fine Art. Without these categories it becomes impossible to distinguish between such terms as kinetic art, machine art, laser art, communication art, light art, computer art, and the list is much larger and growing.

The first major category that evolved also created the Industrial Revolution and it is the machine. Keep in mind that the development of Kinetic Fine Art was not linear. I explain it in linear terms for the sake of order and simplicity. Let us also keep in mind that each category of development of Kinetic Fine Art had an incubation period before it actually became recognized as an art movement. Machine Aesthetic had its incubation period with the constructivist. In the words of my former Design Foundation instructor, Ulrich Niemeyer who is an artist and considers himself a constructivist, "Constructionism is a post-cubist movement which deals in part with sculpture by way of the machine originated aesthetic. In other words, the sculptures are not carved or modeled. They are constructed from wood, metal, paper, glass, or modern industrial materials such as steel, aluminum, or plastic, and then assembled." It is through the experiments of the constructivist that Machine Aesthetic was born. With that in mind let us start with "the Germans during the Industrial Revolution" (Popper, Origins and Development of Kinetic Art 95) who "adopted the term 'kinetic arts' for the arts of gesture." In this atmosphere of arts of gesture and expanding mechanical technology within the German culture, the Bauhaus was formed. Mainly thought of as an Art Design Institution, Bauhaus had many fine art artists as well. One of these artists had a major impact on the United States, "Lazlo Moholy Nagy, an instructor at the Bauhaus, established an American branch years later, in Chicago (Popper, Art of the Electronic Age11)." He was a constructivist and his work evolved into kinetic art. "Moholy Nagy, although his output in sculpture was small, is ranked very high among the constructivist" (Greenhill 364). Naum Gabo also started as a constructivist. Then after becoming an instructor at the Bauhaus, he soon became a kinetic artist. But his early focus was with kinetic sculptures that implied, or had a virtual motion. The use of some type of motion and the machine aesthetics employed by the

Bauhaus, used in reference to Kinetic Fine Art, was clearly brought into the physical realm by the constructivist experimenting with motion.

But the constructivists were not only in Germany. They were in many European countries and in the United States as well. Pevsner, Marcel Duchamp, Thomas Wilfred, Alexander Calder and several others were also very active. “It was in 1920 that the word ‘kinetic’ was first used in connection with the plastic arts” through Gabo and Pevsner in their Realist Manifesto (Popper, Origins and Development of Kinetic Art 95). There were many artists from many different places that were developing Machine Aesthetic.

Machine Aesthetic had an even earlier incubation period than the constructivists’ experiments. The hydro-clock during the time of Ancient Greece is an ancient start of this incubation period. During the middle Ages elaborate clocks were developed with a sequence of events unfolding. “In the seventeenth century we see the development of a new phenomenon, the human or animal automation which imitates lifelike appearances,” which had an even earlier appearance in 1350 at the Cathedral of Strasbourg with an animated wooden crow (Popper, Origins and Development of Kinetic Art 122). So, although Kinetic Fine Art has been around for many years, it is in 1920 that most scholars agree that Kinetic Fine Art was born as a movement in the arts. It was Machine Aesthetic as the focus of this movement.

The second major technology to evolve and influence Kinetic Fine Art is the evolving technology of light. As machine technology was in full bloom, light technology was being born. In 1905, Thomas Wilfred began to explore kinetic painting. “His components were no more than a cigar-box, a small incandescent lamp and a few pieces of colored glass,” while rejecting the use of music in his art (Popper, Origins and Development of Kinetic Art 161). Later in 1919, Thomas Wilfred developed, the Clavilux, a color organ that was not only Machine Aesthetic, but Light Aesthetic as well. The Clavilux consisted of a keyboard that controlled a projection of light onto a translucent screen. Although Thomas Wilfred was an early pioneer in the incubation period for Light Aesthetic, he is a prime example of how Kinetic Fine Art did not develop in linear terms. The three forms of Kinetic Fine Art did not occur in a clearly linear fashion but looped and overlapped in their development in time.

Moholy Nagy’s light machine, or Lichtrequisit, is a prime example of Light Aesthetic in the incubation period, which occurred in the same time period (1923-30) as Thomas Wilfred’s Clavilux. Popper explains that this machine was a moving sculpture made of polished metal, which reflected light (Origins and Development of Kinetic Art125). Reflected light is one of the many different ways to express the Light Aesthetic. But it wasn’t until 1956 that Light Aesthetic as a recognized movement in the visual arts began overtaking Machine Aesthetic. At this point Kinetic Fine Art became well known.

The color organ began the incubation period for Light Aesthetic. Father Louis Bertrand Castel, a Jesuit philosopher, is credited for inventing the first color organ in 1734 (Roukes107). “Father Castel was working towards a new art of light”…Bainbridge Bishop developed a color organ in 1880 that projected lights onto a screen…Frederick Kastner developed a gas organ called the “Pyrophone” in 1869-73” (Popper, Origins and Development of Kinetic Art 156-157). The

intricacies, in Kinetic Fine Art, are almost impossible to follow. The art form called light art is another source of confusion in Kinetic Fine Art. In order to be a Kinetic Fine Art the art form must have some type of motion. Early neon light art forms had no motion implied, virtual or actual.

The South American Gyula Kosice introduced the Light Art there. Popper points out that by 1910 George Claude invented the vapor-tube filled with neon gas…. In the 1930's a few artists used neon tubes for decorative purposes (Art of the Electronic Age 17). "Credit for the earliest attempt to use neon light as a principal material of sculpture is usually given to Gyula Kosice, who produced his Luminous Structures in Buenos Aires in 1946" (Popper, Art of the Electronic Age 17). Gyula Kosice was a great experimenter with different art forms. He was also a kinetic artist. But, his Luminous Structures have no implied, virtual, or actual motion. So it is not Light Aesthetic. Light Aesthetic pertains to some form of motion. This illustration of light art is a contributing factor to some of the confusion surrounding kinetic art. This one of many reasons to elevate the term Kinetic Art to Kinetic Fine Art, as not all technological art pertains to motion.

In 1955, the experiments of scientist and artist Frank Malina heralded a remarkable renewal in the art of moving light (Popper, Origins and Development of Kinetic Art 165). This is when Light Aesthetic really took off. During this period Frank Malina incorporated virtual motion, spectator motion, actual motion, moiré effects, and artificial light into his work. Frank Malina's kinetic work called "Lighted Animated and Ever-changing Picture Arrangement" incorporates two categories: Machine Aesthetic and Light Aesthetic combined with the moiré effect. Then in his next stage of development as an artist Frank Malina incorporates the entire three categories of Kinetic Fine Art into one art form: Machine Aesthetic, Light Aesthetic, and arguably an early form of Computer Aesthetic in his Lumidyne system series. This series of artwork is actually the start of the incubation period for Computer Aesthetic. Frank Malina used electronics and regulators extensively to control the movement of motors and light patterns in his kinetic paintings, and that constitutes early cybernetics. Cybernetic art is merely an attempt to control light effects with mathematical programming, electronics, and or a microchip. Through the experiments of Frank Malina, we can vividly illustrate the phenomena of Light Aesthetic growing out of Machine Aesthetic, along with an early beginning of Computer Aesthetic.

The computer is the third major advance in technology within our modern times to influence Kinetic Fine Art. Computer art is often thought of as static digital images on a computer screen. For example, any digital image created in Photoshop is thought to be computer art. This is another reason to elevate the term computer art to Computer Aesthetic when in reference to Kinetic Fine Art. Computer Aesthetic as a movement in Kinetic Fine Art began in an attempt to control the light effects in Light Aesthetic. As Light Aesthetic continued to grow, it developed through many forms of Kinetic Fine Art: reflected light, laser light, holography, and interactive environments. It was a natural form of progression to employ mathematical programming to control the effect, which gave birth to cybernetic art. "The word is derived from the ancient Greek 'kybernetike' meaning, roughly, 'steersmanship'" (Malina, Kinetic Art: Theory and Practice176). It is a term used in reference to control. An early form of control over the effects of light was through electronics. Before the microchip, even before the transistor, there was electronics. This use of cybernetics is the actual beginning of Computer Aesthetic. Some examples of this period of transformation are Jean-Pierre Yvarol "Interference", Nicholas

Schoffer “Cybernetic Light Tower”, Piotr Kowalski’s “Field of Interaction, and Nam June Paik's Video Synthesizer. Nam June Paik' Video Synthesizer may actually mark the start of the Computer Aesthetic.

I find Kowalski’s experimentation with Light Aesthetic to be an excellent example of this transformation. His artwork evolved from pure Light Aesthetic to Computer Aesthetic. Kowalski began with neon light and then his art evolved into installations using an early form of cybernetics in the form of electronics, and that evolved into environmental light shows. “Kowalski has also created such environmental works as Field of Interaction (1983) in which the physical interactions of the spectators modify the structure of luminous elements in a simulation of urban space (Popper, Art of the Electronic Age 21). He is just one of many pioneers for the creation of the Computer Aesthetic. Computer Aesthetic, to put it simply, is the use of some form of mathematical programming, electronics, or a software program (such as an animation or video editing program) to control, or to create the art form. But for it to be Kinetic Fine Art, it must have some element of motion: actual, virtual, or spectator.

Now that I have explained the progression of Kinetic Fine Art through the major technological advances of our modern time, it would be appropriate to briefly explain the different types of motion employed in Kinetic Fine Art: actual, virtual, and spectator motion. Motor, wind, and water are some examples of actual motion. Virtual motion is an illusion of movement that is nonexistent in physical terms (Roukes13). Op art is an example of virtual motion. An early form of virtual motion was an implied motion in sculpture used by the constructivist. Spectator motion can utilize virtual motion by use of the moving moiré pattern, or reflective materials. As the spectator moves from side to side, lines of motion are created through over-lapping screens, or any shaped reflective material that can reflect the surrounding area. Also, an early form of spectator motion was used in minimal art. As the viewer moved from side to side the shadows in the art form would also move.

CHAPTER III: KINETIC PAINTING

In 1905, Thomas Wilfred possibly made the first acknowledged kinetic painting. Later, in1919, he built the Clavilux. The Clavilux was composed of a translucent screen with a picture painted onto it, with reflectors and filters behind the picture, with mechanical mechanism and a light source. He called it the Lumia system. It was his color organ as mentioned earlier. Then in 1956, Frank Malina painted a picture onto a transparent object ("plate" as he called it). He also painted onto a rotating disc (rotor). A light source would shine through the rotor and plate. The plate (also called a "diffusor") would combine the light, color, and movement. The Cosmos is a good example of how he put his work together. Both of these examples would be considered low-tech kinetic paintings by today's standards. The microchip had not yet infiltrated our society. But in their time, the technology was high-tech. Both artists used the high-tech of their time to incorporate motion with a hand painted picture. This is traditional-high-tech kinetic painting.

My first several kinetic paintings, in 1986, were very similar to the two examples just mentioned. They consisted of a screen painting, done by hand, with a large wheel that turned slowly behind the screen painting. The wheel was powered by a dc power supply that I built. I used ambient light, and the wheel also had a screen painting. The screen canvas on the wheel and the picture were of patched screens. In other words, they were about one inch square patches of screen attached together and made to look as one complete screen canvas. The position of the lines in the patches from the front layer (the picture) to the back layer (wheel) would determine the direction of the moiré pattern movement. This moving moiré pattern mixed with the painted screen to create the total effect. I named the artwork "Santuario."

A moiré pattern is simply a pattern seen by the eye but it doesn't actually exist. When placing a screen over another screen, if you move either screen at some point you'll see a pattern emerge. This pattern is created by the line interference of the two screens and does not actually exist, but is seen by the eye as a pattern.

The Santuario (formerly the 'Kinetic Visual Display') was my version of a traditional-high-tech kinetic painting. The stream looked as though it was flowing, and the trees swayed in the wind. The moving moiré pattern was created by the rotating wheel, which had a layer of screen in relation to the screen in the front. This information is only to allow you to see some of the progression that my kinetic painting has taken. This Field Project is a transition from low-tech (electronics) to high-tech (microchip) fine art.

Now, I am ready to describe the details of how my Field project was built. First using some hand drawings and the graphic program called Photoshop, I developed some pictures of patterns. These images were just plain black and white pictures. Then I brought these patterns into another program called After Effects. In After Effects, I put an alpha channel onto the white areas of the picture that was on the top track. This made the white areas transparent. Then I animated the picture on the top track to move over the other picture on the lower track. Due to the white area being transparent on the top track, the lower layer, or track was seen through these areas. The interference of lines from the two layers, or tracks created a moving moiré pattern. I would like to add that this is not how I normally made moiré animations in the past. Normally, I would make them in an animation program. But, I found the combination of Photoshop and After

Effects to work easier, especially when it came time for rendering. A great deal of experimenting took place before I finally found this combination of programs to work for me. I still use a regular animation program, such as 3D Max or Lightwave, for some effects, but for the most part the video animation of After Effects has much more flexibility and control.

Also with the flat panel plasmatron monitor that I use as part of the kinetic painting, I can see the results instantly in the areas desired. Before starting this process of experimentation, I had a picture in my mind for a screen painting. So the movement had to be in certain areas to create the desired effects in the finished kinetic painting. Once I had the animated effects, in close proximity to the vision in my head, it was time to start the hand painted screen painting. This was actually the easiest part of the whole process, especially since I had been painting, in Maryland, on screens for many years previously. But in order to paint a screen painting for the plasmatron monitor, I had to build a stretcher to fit onto the monitor.

Normally for a screen painting, I would stretch the screen the same as I would stretch a canvas in preparation to do a painting. The normal way to stretch a canvas, or screen is to use a canvas stretcher, then apply gesso to the canvas. But in this case, I had to see how the screen painting would look, on the plasmatron monitor, as the painting was in progress. So a stretcher had to be custom built onto the plasmatron monitor to allow me to play the video animation during the progress of the painting. The stretcher was built using galvanized steel. The galvanized steel was welded together using oxygen and acetylene compressed gas cylinders. Once the stretcher was built and fitted for the plasmatron monitor, the screen was attached to the stretcher. The attaching of the screen to the stretcher was a little tricky. It was a lot different from attaching a canvas, or screen canvas, to a canvas stretcher. It is important to stretch a canvas or screen canvas so that it doesn't sag as you are painting. Normally wedges are used at the inner corners of a stretcher. They are lightly tapped with a hammer at each corner until the canvas has the desired tightness, or stretch. But with this custom built steel stretcher, I had to first attach the screen canvas to one side, then hold the screen canvas tight on the other end of the steel stretcher, and attach the screen canvas to that side. The screen canvas was attached to the steel stretcher using strands of wire taken from the screen canvas. Also, the steel stretcher was built, with an additional strand of flexible wire, so that it could be used for final tension adjustment to the stretch of the screen canvas.

Once the screen canvas was attached to the custom built steel stretcher, I was ready to apply the gesso to the screen canvas. Gesso has to be applied to the screen canvas in order to preserve the screen painting from the backside. This seals and protects the screen canvas from oxidation. Of course, the front of the screen painting will be protected by the use of an acrylic varnish. After applying the gesso, I was almost ready for creating the screen painting. But before applying any paint to the screen canvas, a design had to be sketched out on scratch paper. After making many sketches, I finally found something that was an approximation to what I envisioned. The light patterns of the video animation showing through the screen painting will eventually change the overall look of the design. So consideration had to be made for final adjustment of the animation and final touches of the screen painting for the eventual combined effect, after completing the rough design, I placed the design on a large flat table. Then I placed the prepared screen canvas on top of the design, and using the design as a guide, sketched an outline drawing on to the gesso

surface. The sketch on the gesso has no detail and is only needed to approximate the composition for the screen painting.

Now the actual hand painting can be painted. The steel stretcher was then attached to the plasmatron monitor. This was done mainly so I could visualize in my mind the picture that I was about to paint. The plasmatron monitor has a wide groove on all sides of the monitor, which was already part of the design of the monitor. So the steel stretcher that I built fitted onto this groove. This stretcher could be easily removed and re-attached at my discretion. The first thing a painter does when painting a picture is to lay down paint. Since I didn't want any paint to get onto the monitor, I painted using an easel. In other words, the screen canvas while attached to the steel stretcher was placed onto an easel. At intervals of the painting, I would attach the screen painting, which was attached to the steel stretcher, to the monitor to see the progress. At times I would play the animation to see the combined effect of the animation with the screen painting.

As a reminder, it is the combined effect of the hand painting on screen, and in this particular case, the video animation that constitutes the kinetic painting. Once the screen painting was near completion and most of the paint has been applied, I was ready to make a temporary attachment of the screen painting to a picture frame. The picture frame was eventually fitted on to the plasmatron monitor. In this case the picture frame was a custom-built picture frame, made by a professional frame maker, not me. The screen painting was actually attached to a Plexiglas, which was then attached to the picture frame. Then, I was ready to make adjustments to the video animation. The adjustments to the video animation were actually a very long process due to a low-end workstation, and each change had to be rendered. Also since the kinetic painting is a combination of screen painting and video animation, each change, or adjustment had to be viewed with the screen painting attached to the monitor as the video animation was running. Also, since the screen painting obstructed my view of the video animation while editing, the screen painting had to be taken off the plasmatron monitor and replaced many times. Then the screen painting was eventually reattached to see the combined affect. This was my difficult learning process of creating this type of kinetic painting. The majority of the testing at this point was due to my adding some actual video to the animation, which I had previously taped. I had some video shots that I took of a Flamenco performance. But, before this explanation of my method continues, this might be a good time to explain the result that I was aiming toward.

The actual screen painting is of a mother buffalo and its calf. They are surrounded by storm clouds, with painted moiré patterns going through the clouds and the buffalos. This is the actual screen painting, which is attached to the picture frame. Another screen painting is actually attached to the plasmatron monitor. This second screen painting is just a black and white pattern. Together these two screen paintings constitute the hand painted portion of the kinetic painting. Also, a portion of the first screen painting is of sunrays. These sunrays are actually going through the mother buffalo. Both screen paintings are painted with acrylic paint. The video animation has two different moiré animations showing through the screen paintings. One is for the cloud area. The other is for the mother buffalo and its calf. These two moiré animations are separated with a bezier mask created in After Effects. They are blended together with a feather, which is also created in After Effects. The Flamenco video shots are composited with an alpha channel, and then they are composited with the moiré animations. Then to blend the video animation with the screen painting, I composited an altered southwest still into the video animation along with the

Flamenco dancer, combining effect flamenco dancing with moving moiré patterns, within a southwest scene that has a buffalo and calf, with sunrays going through the buffalo.

Now, I will pick up the process with the video animation near done, and the picture frame with screen paintings attached to the plasmatron monitor. I also left the screen painting near done, purposely. So now, I could now put the finishing touches to the screen painting. Also while making final adjustments to the screen painting, the final adjustment was then added to the video animation. Once this process was completed, the kinetic painting was finished.

There was one more twist to the creation of this kinetic painting. A small computer had to be attached to the plasmatron monitor wall-mount. This was done so that the kinetic painting could be hung, on a museum wall, as one complete unit. I did not want the computer (CPU unit) that is running the video animation to be external from the kinetic painting. So I found a small computer on the Internet that could fit behind the plasmatron monitor as it hung from the wall. Before attaching this computer to the wall-mount, I had to test the computer. I was fairly sure with the specifications of the computer that it would run the animation, but I wasn't sure if it would run continually for a long period of time. Once satisfied, I attached the small computer to the monitor's wall mount bracket.

The wall mount unit was not designed for this type of an attachment, so by using two wall-mounts, I was able to redesign the wall-mount to accommodate the small computer. Also, the keyboard and mouse had to be attached to the wall-mount. This was needed in case of a power outage and then the small computer could be restarted. So with the kinetic painting completed, the video animation completed, and the computer components attached to the wall-mount, this was the completion of the Field Project.

CHAPTER IV: OBSERVATIONS OF RESULTS

The foremost important observation of results to me is that as a result of this Field Project, I have transformed my kinetic painting ability. No longer do I see myself as a low-tech kinetic painter. I have personally transformed into a high-tech kinetic painter, and my artwork has transformed from Machine Aesthetic into Computer Aesthetic. But, there are many other results as well.

Another result is that a bridge between traditional art and high-tech art has been built. This is a bridge between the traditional (hand-made) paintings: to art being made by the technology. Many of the traditional artists working with their hands do not see high-tech art as real art. This is mostly because the use of eye and hand working together to create the art form is not visually apparent in most high-tech art. Looking at this same problem from the high-tech artist viewpoint, many of these high-tech artists of today reject the notion that art has to be hand-made to be art. My version of kinetic painting has the potential for bringing these two opposite views together. This version of kinetic painting that I have created uses both eye-hand coordination of the artist, and high technology to create art form.

A few of the observations were totally unexpected. The main one is the use of ambient light. While I have always considered ambient light in my artwork and was aware of this important property. I have never seen the potential that I am presently going to explain. First I'll have to state that I have skylights in my studio. Of course, as the light changes outside this affects the ambient light in my studio. One day as I was making a change to the video animation, and was playing the animation to view the results, a cloud passed over and obstructed the sun. At first, just before this happened, I was thinking to myself that the change I had just made to the video animation worked well in combination with the screen painting. Then as the cloud passed over, the change to the video animation that I though worked, suddenly didn't work. I had been under the assumption that the light patterns coming from the video animation would take the precedence over any changes in ambient light. This was a false assumption. At this point a decision had to be made. There were many questions going through my mind. Should I wait for the sun to come back out? Should I adjust the animation for cloudy days? But then on sunny days it wouldn't have the effect desired. Since I had no way of controlling the ambient light in the daytime, I decided to work only at night. But as I continued, I realized that some of the changing affects created when the sun was out were better. Also, some of the affects created by a cloudy day were more effective. Then it occurred to me, why not incorporate changing ambient light into the artwork. So this is what I attempted to do. This way of working has added a great deal of more complications to the development of this artwork. But I think the result is worth the extra work because of the added potential to the effect.

I'll try at this point to give you an idea of the drastic change ambient light has had on this kinetic art form. When the ambient light is bright, the screen painting is prominent in the overall look of the artwork. In other words, the video animation isn't even seen by the viewer depending on the brightness, or it may be partially seen in varying degrees. It also works the opposite way for no ambient light. When there is no ambient light, total darkness, the screen painting isn't seen at all. Only the video animation is seen. But as you increase the ambient light slightly the screen painting begins to appear. It seems so obvious now, that this changing ambient light would have this affect on the overall look of the kinetic painting, but until I actually saw these changes taking

affect, I really didn't understand the power of control that existed. The middle ground is to create the video animation so as to be effective in a large range of ambient light. The brightness of the video animation combined with the contrast was helpful in creating an optimal viewing experience.

Another unexpected observation that affected the results was the Plexiglas protection. There was an option to use regular clear glass, but glass is very brittle and could break. Whereas Plexiglas is just as clear as glass, but it doesn't break as easily as glass. I may change my mind later, but I am now using a Plexiglas protection for the screen painting. This is mostly to protect it from people touching the screen painting. The screen painting could easily have a hole poked by a viewer pressing on the picture with their finger. Art patrons are very curious and often want to touch the artwork. But, the main problem with using this protection is once again the ambient light. It can leave a reflection on the Plexiglas and obscure the view. So careful attention has to be paid to the relationship of the screen painting, in relation to the positioning of the source of the ambient light, as another option is to eliminate the Plexiglas and hope for the best.

One other technical problem that wasn't anticipated was the small computer that was attached to the wall-mount bracket. This small computer was not difficult to attach to the wall-mount bracket, but the keyboard and the mouse also had to be attached as well. Keep in mind the plasmatron monitor was not designed to have a small computer attached to it in this way. The mouse and the keyboard also had to be attached, since they could not be disconnected from the central processing unit without possibly interfering with the smooth running of the video animation. But, the mouse and the keyboard had to be attached in a way that they could be removed from the wall-mount easily. In case the video animation stopped for any reason (such as a power outage), and then the mouse could be used for restarting. These problems were not anticipated. The net result is that if you look behind the plasmatron monitor, it may appear to look a little clunky within the wall-mount bracket. But since plasmatron monitors are not made with computers built in, I had little choice if it were to be as one unit.

CHAPTER V: DISCUSSION OF IMPLICATIONS

The moving moiré patterns are an integral part of the visual experience. It is presently used in the aesthetic effect of the visual experience. It is my belief that there is more here, in the moiré pattern, than meets the eye. The use of the moiré pattern has been used in scientific experiments for over a hundred years. Lord Raleigh was the first to use moiré, over a hundred years ago, in order to check the accuracy of diffraction gratings (Roukes 21). But even more recently, it has been shown that by using graphite crystals and x-rays, a diffraction pattern of line interference can be formed from any object. It has been shown that even DNA has a diffraction pattern of line interference, or what I would call a moiré pattern. Where is this concept of line interference being used today? The lines of magnetism interfering with each other create electricity as one magnetic field is moved through another magnetic field. Also, two separate lights of laser beams interfering with each other, and recorded onto a plate, create a hologram. The two separate lines of magnetic frequencies of capacitance and inductance can create resonance. Resonance is essential in transmitting and receiving radio and television waves.

Kinetic painting is a potential tool for visualizing the unknown world of line interference of magnetic frequencies. It is my theory that these magnetic frequencies of line interference create a moiré pattern that is the fabric of our existence. Art as a whole has gone through a long period of self-destruction. This destruction was necessary for everyone to discover the artist in each and every one of us. It is now time to reconstruct art and discover the core fabric of life, line interference.

GLOSSARY

Automation	Mechanized method to describe complex task that are similar to human senses
Color Organ	A device that projects color by means of a keyboard.
Communication Art	An art form that is developed in separate locations and combined by a satellite connection
Computer	An information processing and storage device with inputs and outputs that are processed digitally through the control unit
Computer Art	An art form that is computer graphic
Computer Aesthetic	The third category of Kinetic Fine Art, which corresponds to the third major technological advance of our modern times: the computer, which utilizes mathematical programming, and or electronics, and or microchip to control or create the art form, and pertains to motion
Computer Graphic	Static or dynamic image output of a computer
Cybernetics	The use of mathematical programming, and or electronics, to control and or create an art form
Electronics	The use and manipulation of electrons
Hardware	Physical components
Interference Lines	Physical, and or non-physical lines that obstruct other physical, and or non-physical lines
Kinetic Art	Any art form that has actual, virtual, and or spectator motion
Kinetic Fine Art	An elevated term used to simplify and describe the chaotic progression of kinetic art by creating three major categories: Machine Aesthetic, Light Aesthetic, and Computer Aesthetic
Kinetic Painting	A kinetic art form that is either, hand painted, technology painted, or a combination of hand and technology painted

Laser Art	Produced electronically and usually controlled by a computer
Light Art	Any art form dealing with light
Light Aesthetic	The second category of Kinetic Fine Art which corresponds to the second major technological advance of our modern times: light, and pertaining to motion
Machine Art	Any art form dealing with the machine
Machine Aesthetic	The first category of Kinetic Fine Art which corresponds to the first major technological advance of our modern times: machine, pertaining to motion
Plasma	Ionized gas whose electrical properties determine the dynamic properties
Plasmatron Monitor	A display device utilizing plasma
Plexiglas	A plastic material usually in clear sheet form
Program	Sequence of machine instructions

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