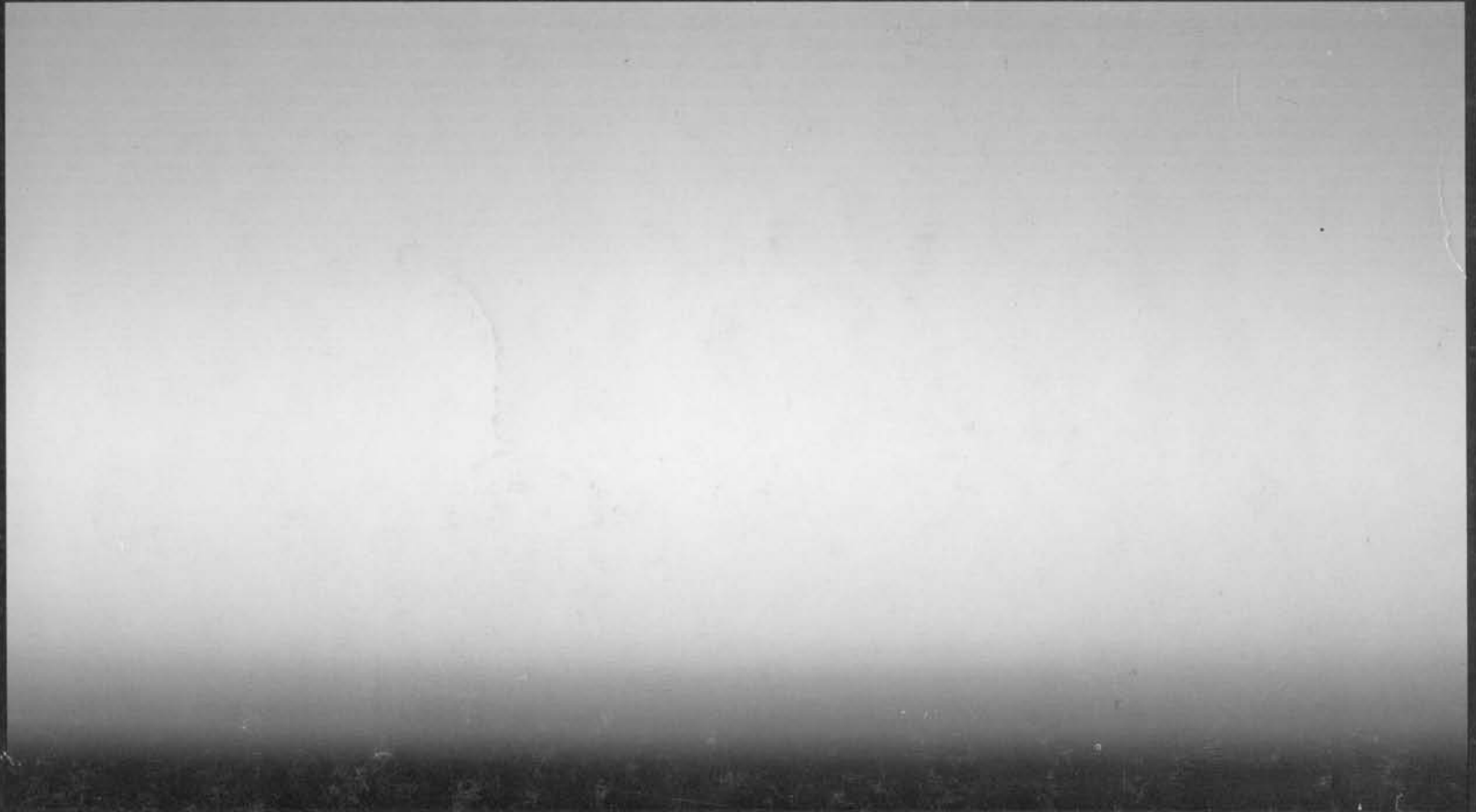


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# The Second Emerging Expression Biennial: The Artist and The Computer



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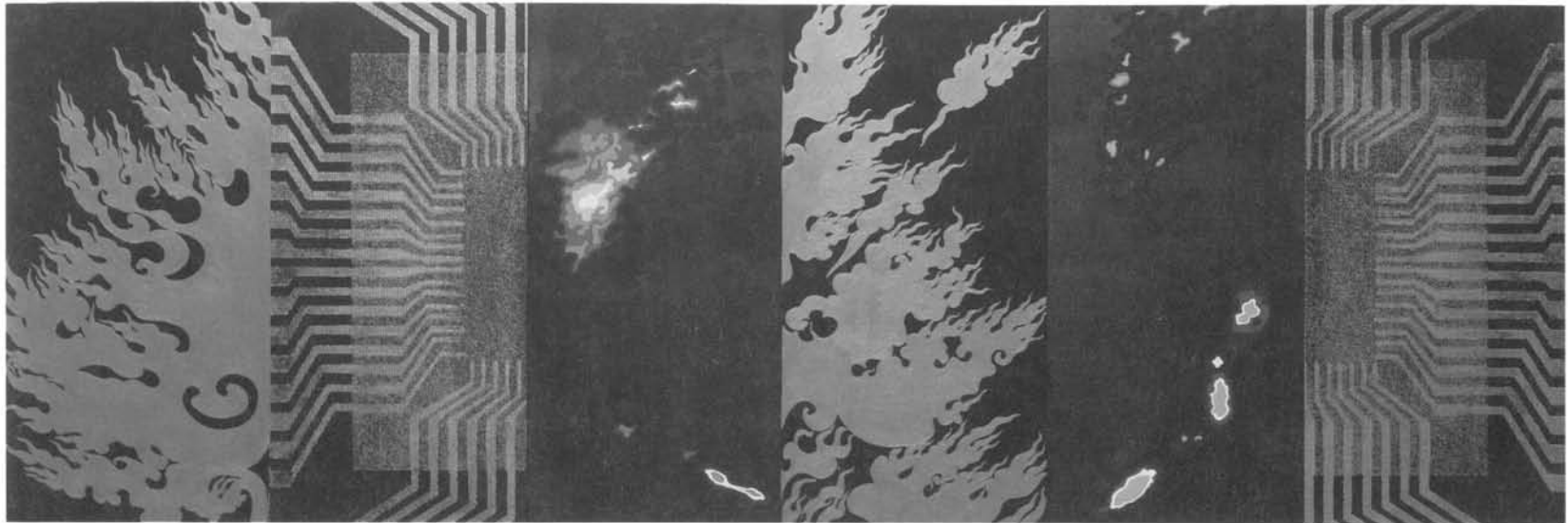
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pg. 28 image should be reversed  
pg. 39 title of the work should read "Square Tonal Drawing 1985"  
pg. 42 photo caption should read "Ilene Goss Schuster, Passages 1985"  
pg. 49 photo caption should read "Christa Schubert, Untitled 1986"  
pg. 59 photo caption should read "Tanya Weinberger, Z. 1986"

# The Second Emerging Expression Biennial: The Artist and The Computer

September 17, 1987 - January 24, 1988



Carter Hodgkin  
A.I. #9. 1986

**The Bronx Museum of the Arts**  
1040 Grand Concourse  
Bronx, New York 10456

Curator  
Luis R. Cancel

Jurors  
Shalom Gorewitz  
Patric Prince

Cover:  
Norman Zammitt  
**Caly-Forny-Ay.** 1987

This exhibition and publication were made possible by grants from AT&T Foundation. Additional support is provided by the National Endowment for the Arts, the New York State Council on the Arts, and the Department of Cultural Affairs of the City of New York with the cooperation from the Office of the Bronx Borough President.



Manfred Mohr  
P-397/A. 1986

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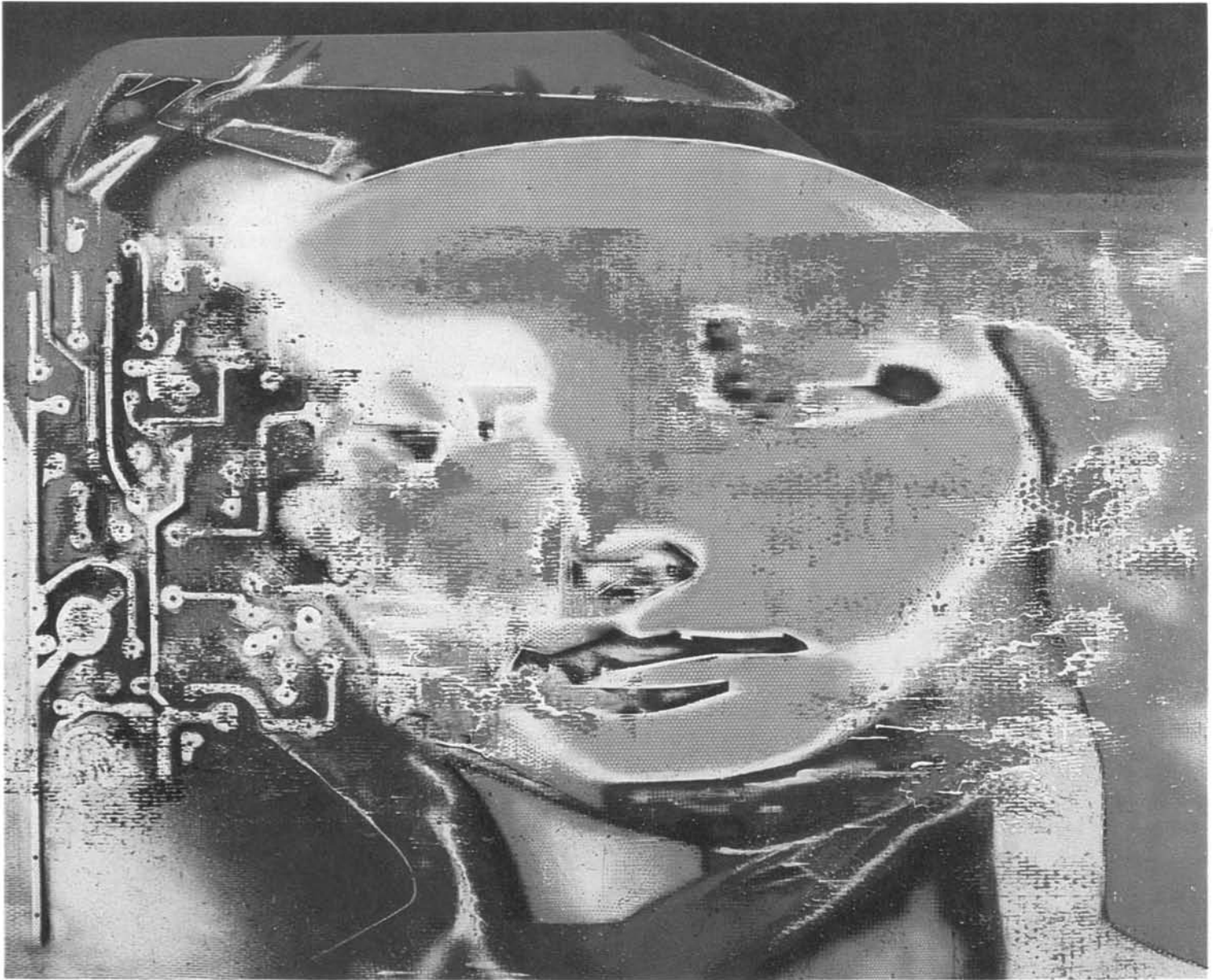
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Jeremy Gardiner  
**Jester.** 1986

## Acknowledgements

I want to thank the sponsors who helped to make this exhibition possible. First, I would like to thank the **Museum Program** of the **National Endowment for the Arts** which for the second time has supported the Bronx Museum's efforts to survey the field and see what artists are up to with computers. The Museum also received important support for the second time from the **Media Program** of the **New York State Council on the Arts**. Both of these agencies dispel the prevailing notion that the government can't be innovative and forward-looking.

I also want to especially thank the **AT&T Foundation**, which has given so generously to support the catalog, which is vital for documentation of this evolving art form. The Museum has worked very closely with **Ms. Esther Novak**, Vice-President of Cultural Programs at the AT&T Foundation and **Ms. Maryann Seduski** and **Ms. Susan C. Dessel**, Public Relations Managers at **AT&T**, the parent corporation, to ensure that the exhibit and its artists receive as much exposure as possible. For that the Museum is deeply grateful.

I want to give special thanks to the two guest jurors who helped me to select and curate this year's exhibition: **Patric Prince** and **Shalom Gorewitz**. Participating in the jury was a particular hardship on Mr. Gorewitz, who is one of the most significant and poetic video artists in the field. Museum ethics precluded us from being able to include his work in the exhibition, but his expertise helped to make the selection process far stronger. Thanks to his efforts, twenty-four video artists representing a diverse group of styles and approaches, are included in this exhibition.

Patric Prince, past chair of the SIGGRAPH Art Show Committee is an assistant professor at California State University in Los Angeles. Based in California and having recently curated a national exhibition for the AMC/SIGGRAPH convention in Dallas, she was in a unique position to advise me in the search for "Fine Art" creators out there.

On the Bronx Museum staff, I want to thank the Museum's Registrar, Margaret Rennie, who painstakingly kept track of the more than 200 submissions that the Museum received. Her attention to detail and organizational skills helped to make the catalog possible and the exhibition a success.

Luis R. Cancel  
Executive Director



Laurence M. Gartel  
Catacomb for a Princess. 1986

## Introduction

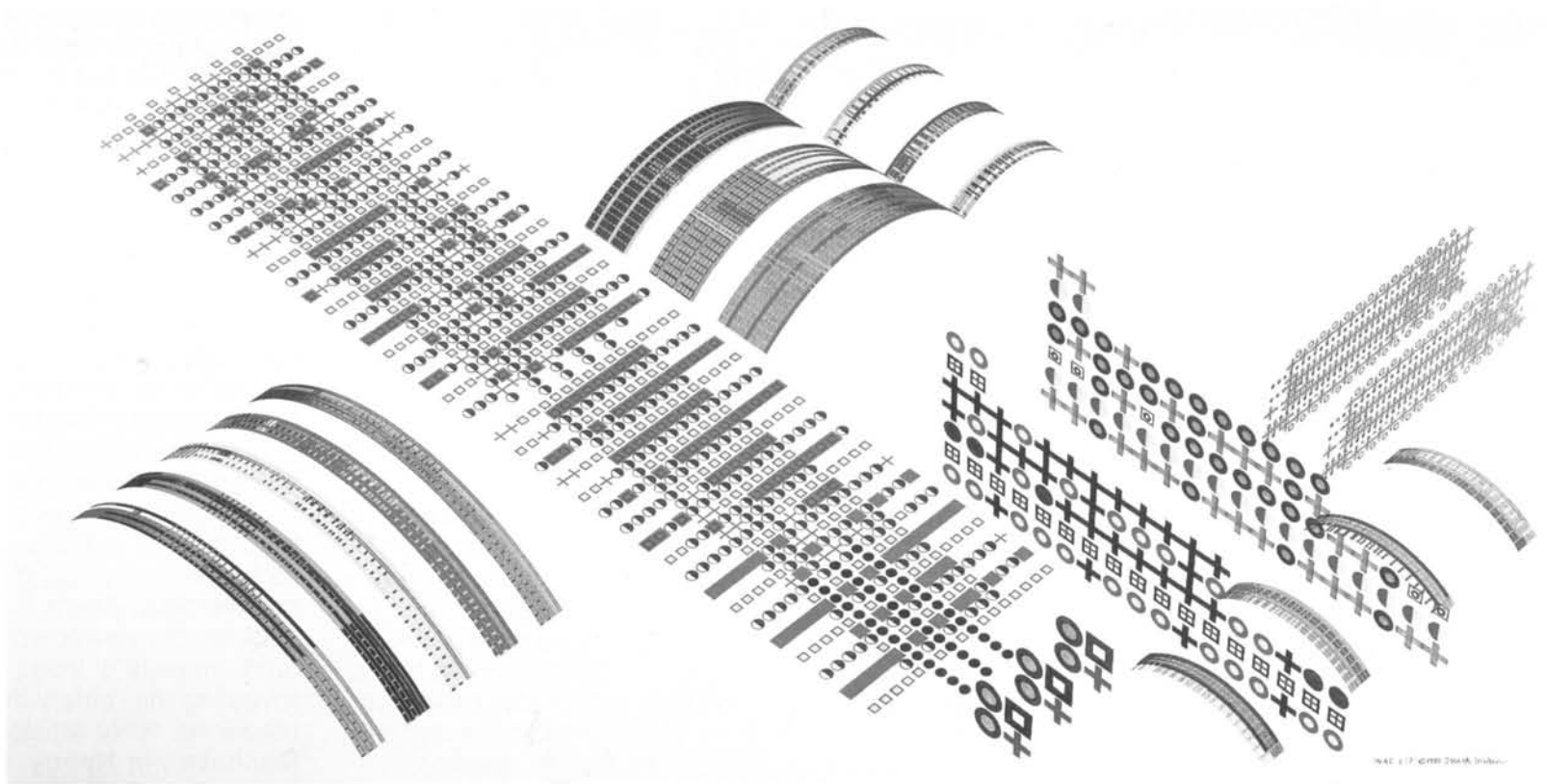
This catalog documents The Bronx Museum of the Arts' second exhibition that seeks to capture the extent to which computers are being utilized as creative tools by visual artists. All of the artists selected for this exhibition employ the computer at some point in the creative process, be it at the moment of conceptualization of the art object, as in the work of Edgar Buonagurio and David Em; as an organizer and drone to help sort out and calculate the complex polygonal forms that comprise the sculpture of Rob Fisher and Raymon Masters; or as the primary tool of creation, as in the case of Manfred Mohr, an artist whose "physical" contact with the final work is minimal. Mohr writes his own software programs and outputs his paintings with a plotter he helped design and build, thus providing for us one of the most unorthodox examples of the introduction of the computer into the traditional process of painting.

The exhibition divides the exploration of these artists into the following groups, each of which share similar interests. There are those artists whose work is created exclusively by the use of computer software and whose output can only be captured photographically, usually in a Cibachrome print, and those who explore the effects of printing their designs on paper or canvas with plotters, like Mark Wilson, Colette and Charles Bangert, and Eudice Feder among others. The patterns and designs of Ms. Feder's work are so subtle that they can only be appreciated by the viewer in person.

As with the monochrome paintings of some of the Minimalists, they resist photomechanical reproduction. The final products of artists like Norman Zammitt, Jeremy Gardiner, Carter Hodgkin, and Mimi Smith more closely resemble traditional painting but their conceptual path has been considerably altered and redefined by the use of a computer. The single largest section of this exhibition, with twenty-four artists represented, illustrates the pervasive presence of the computer in the field of video art. The natural affinity between these two electronic mediums clearly exists, but the range of applications may be surprising for those accustomed to rock videos and soft-drink commercials. Artists like Peer Bode confront the viewer with the fundamentals of video and computers, revealing the "binary innards" of these machines, while artists like Maria Manhattan in **Nancy Reagan Takes The Subway** demonstrates that "high tech" equipment is not always necessary to make a point.

The last group consists of installation artists whose works involve the placement of computers in the gallery. The most ambitious of these pieces is Margot Lovejoy's **Azimuth XX--The Logic Stage**, which she describes as "the struggle to control, represent, and construct meaning in the 'gap between art and life' ."

This exhibition does not attempt to trace the history of some of the early pioneer artists and their adventures in the hallowed halls of science and



technology. Its concern with the most recent years enables the professional and lay public to catch a glimpse of the rapidly changing nature of the interaction between artist and machine. It also draws a line between fine arts and applied or commercial arts. Some of the most technically sophisticated work in computer graphics today is clearly being done by artists working in places like LucasFilms Ltd., Wavefront, and Magi, and their work, seen annually at the national SIGGRAPH convention, is a marvel of the power of commerce to put this new creative tool to work. As, however, The Bronx Museum is not a

science museum, it does not wish to venture too far into the applied aspects of this field. While we do not preclude future exhibitions that may examine the computer graphics field from a design perspective, the goal of **The Second Emerging Expression Biennial** is squarely on the side of aesthetics. Our objectives are to unearth and document the creative ways in which artists are using the computer, and to give critics, curators, art historians, and the artists themselves the opportunity to see what is transpiring across the country.

Some art critics and theorists might

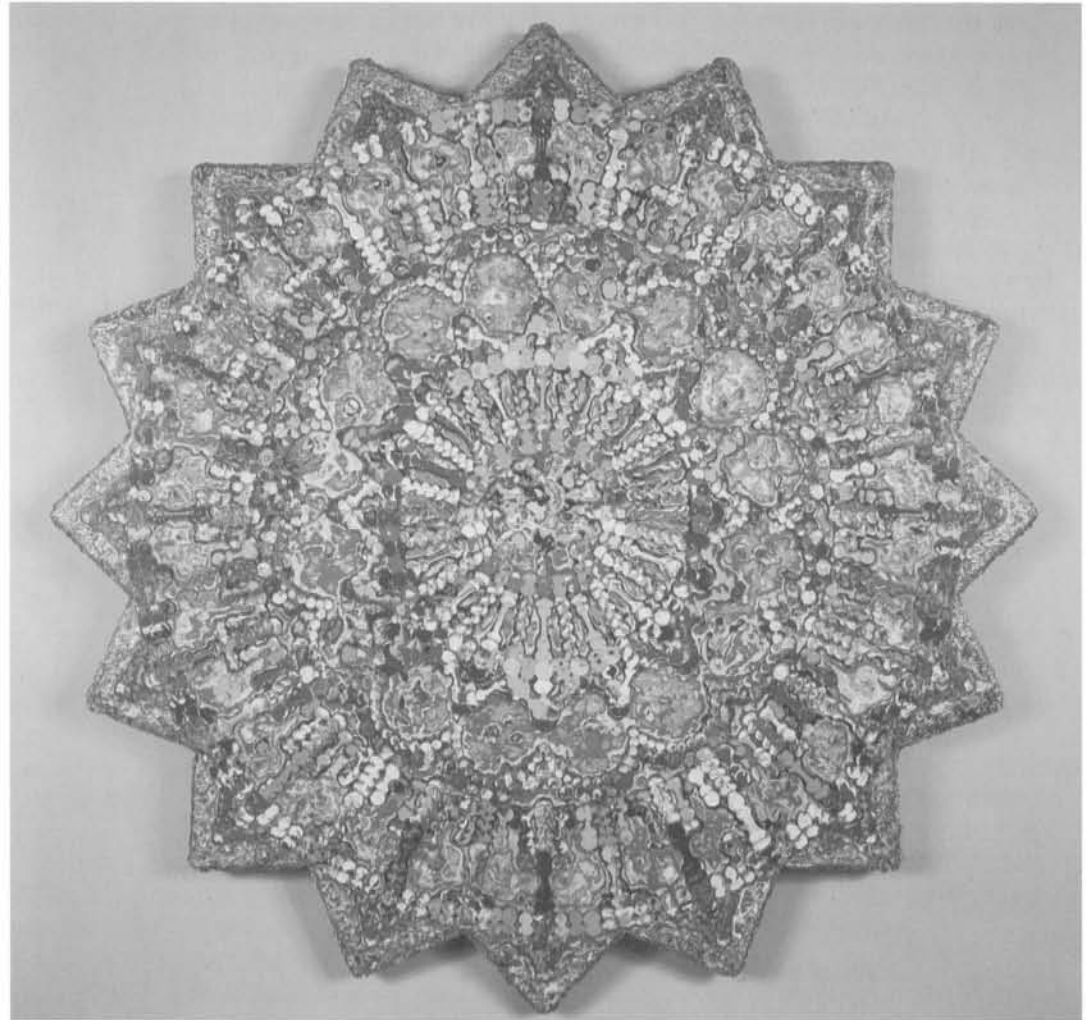
Mark Wilson  
**NAC L17. 1986**

ask questions such as, "Why is it important to document these phenomena? Isn't it a passing fad? Couldn't one just as readily organize an exhibition of all artists who use toaster ovens, or all artists who drive cars?" The answers lie in the fact that the computer is not just a simple machine with only one function. Through significant technological advances over the past three decades it has "evolved" to now have greater capabilities to handle an increasingly complex array of tasks, which vary



with the user. As these task-handling capabilities spilled over into areas which concern visual artists, i.e., the manipulation of color, light, and sound, a natural curiosity developed. The possibility of controlling the fundamental elements of creativity tempt many artists to put the computer and its relentless sequential logic to use in novel and undreamed-of ways. That the computer as a creative tool is worth watching is made evident by the increasing number of artists using them and the diversity of the products they create.

One interesting sidebar to this phenomenon is the development of paint systems; computers which either through software or design allow the user to draw or paint with the computer. The TV screen (or monitor) of such a paint system will typically contain two borders; one with either patterns or color bands that the user can select and another where the user can choose the "tools" for painting the colors or patterns. Usually the tools are electronic symbols for traditional paint tools, i.e., a brush or pen with varying line thicknesses or an airbrush. These icons facilitate the creation of basic shapes like circles, squares, rectangles and polygons. The user communicates with the computer through an electronic tablet with a "pen" or "mouse" attached. The pen or mouse senses the movement of the user's hand and translates it onto the digitized screen where a cursor mimics the movement. Even on the most expensive systems it is not as natural to draw a line with a computer as it is to take pencil to



paper. However, artists have always recognized that every medium has its limitations and strengths and the computer is no different. Discovering the machine's limitations and finding ways around them is half the fun for several of these artists.

Just a few short years ago computer systems capable of providing these paint effects would have cost

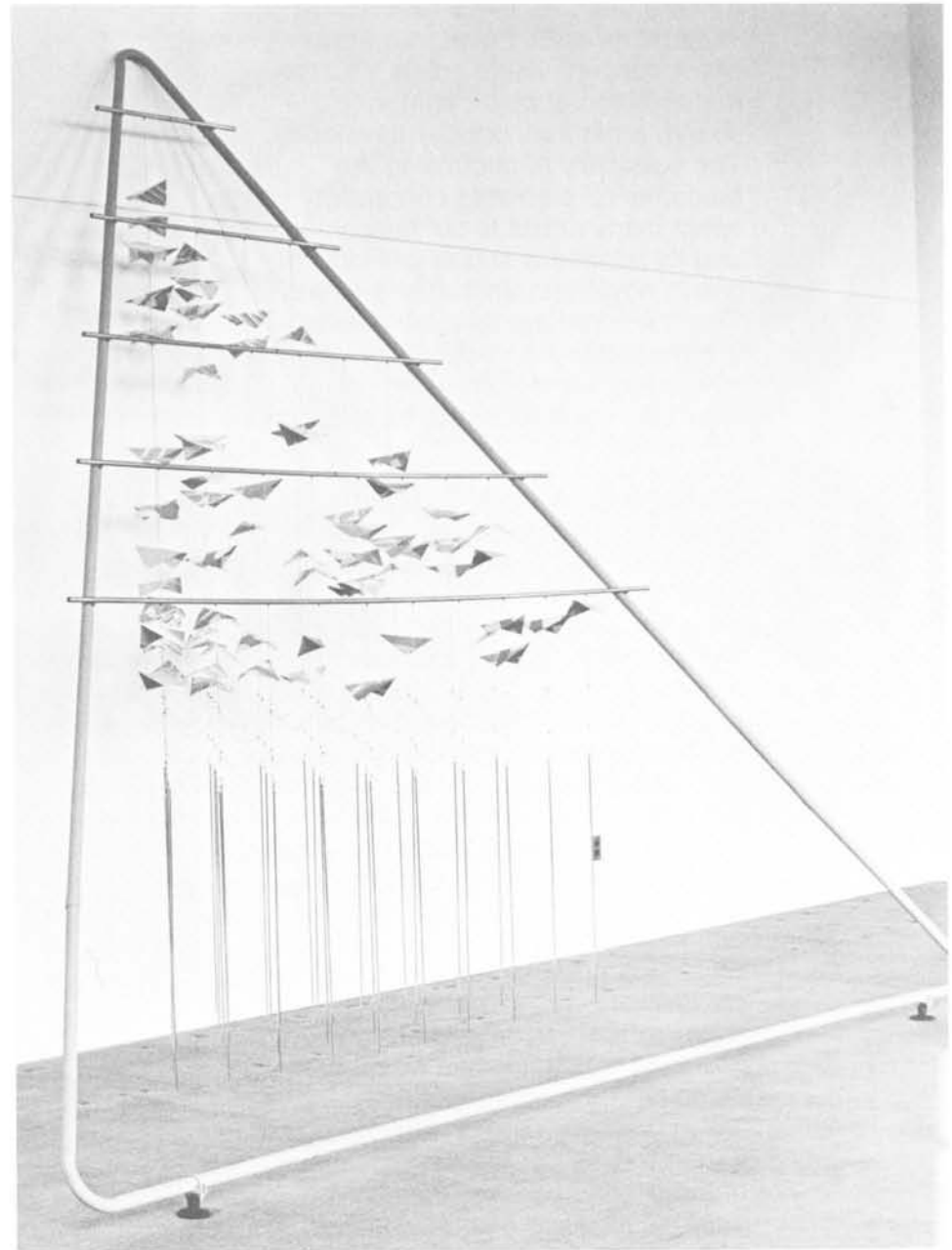
Edgar Buonagurio  
**Corona.** 1986

hundreds of thousands of dollars and would have been totally beyond the reach of most artists (David Em being one of the early exceptions as he was allowed access to the large computers at the Jet Propulsion Laboratories and the Imaging

software of Jim Blinn). Today the cost of this sophisticated technology is tumbling, and it is being adapted to microcomputer systems through a combination of expanding computer memories and specialized software. This allows artists like Laurence Gartell to experiment with paint systems on microcomputers. Gartell's more recent work is especially noteworthy since he transcends one of the limitations of paint systems -- the "signature" of the software. All of the painting programs in commercial use today have particular abilities and limitations, which become apparent if the user/artist stays within the confines of the program. Anyone sufficiently familiar with computer paint systems can very often say, "That was done with a Perkin-Elmer 3220 or a Quantel Paintbox," or, "The artist used software like Time Arts EaselPaint or Mac Paint." The jurors of this exhibition have been guided by the principle that the use of simple computer "tricks" would not be sufficient to warrant inclusion in the exhibition.

All of the artists selected for this exhibition are pushing the boundaries of media, going that extra mile, and helping to establish a path where technology and art can converge in the creation of new tools for human expression. It is The Bronx Museum's hope that biennial exhibitions of this kind here and at other museums will help to encourage that evolution and bring it to the public's attention.

Luis R. Cancel  
Executive Director/Curator



Rob Fisher, with Raymon Masters,  
**Musical Instrument, Skyharp**  
Series. 1986



## Things to Come

Computer art is known as digital art, Nouvelle Image, computer-generated art, synthetic art, computer-aided art, computer-assisted art, technical art, and more. The amount of confusion surrounding the terminology related to this art form is an indication of some of the problems viewers and critics have regarding its place in the domain of fine art. The major mind block apparently concerns associations with the computer as a machine.

Some time around the First World War European society became disenchanted with machines; belief in a mechanical magic wand enlisted in the service of mankind was lost with the realization that technological development could bring war and destruction. The subsequent invention and use of atomic energy not only added to a fear of machines but also shattered hope in a future for mankind.

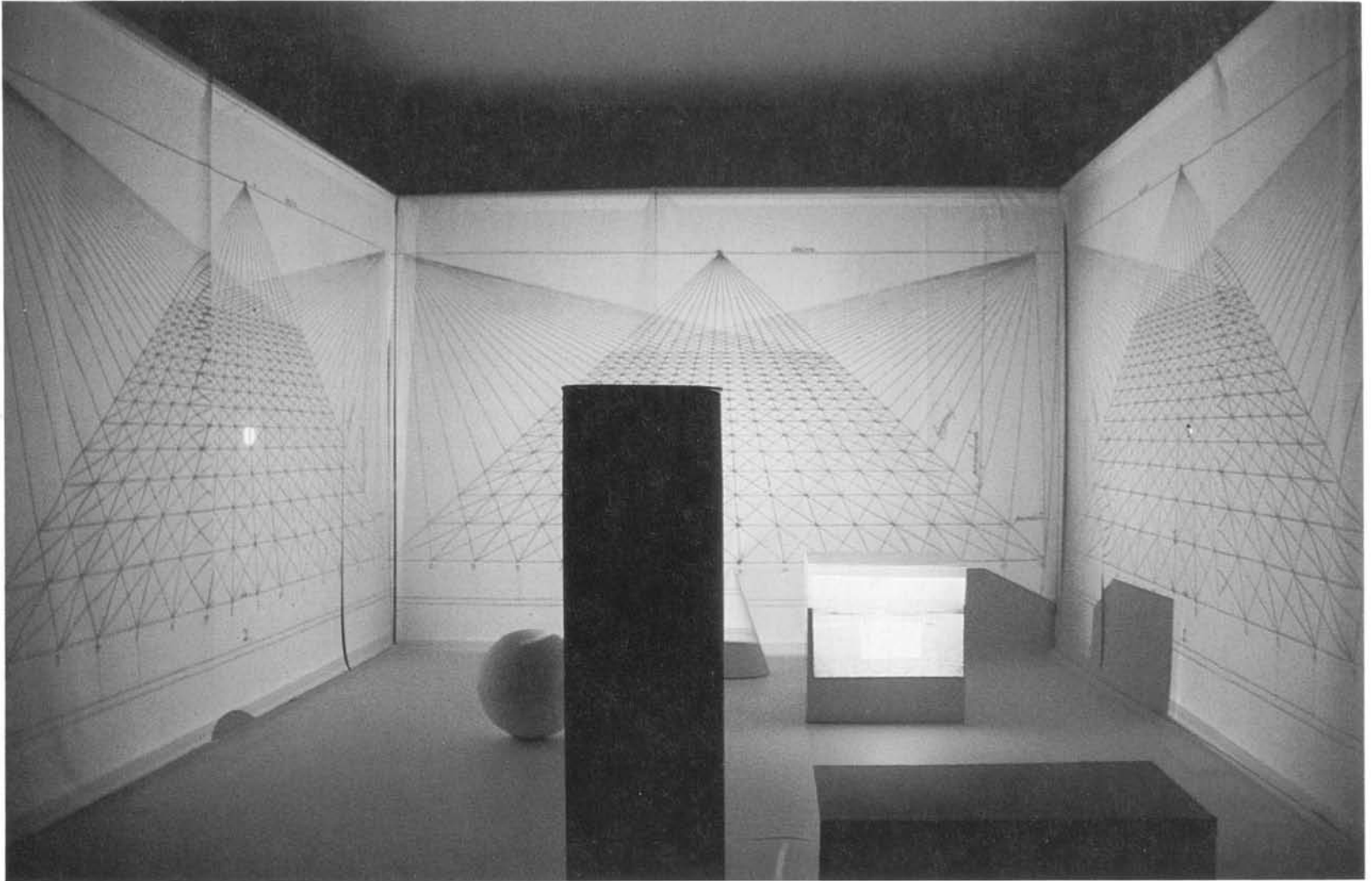
Yet, since the time of the Renaissance, there has been artistic production that combined an interest in science, technology, and artmaking. The artistic use of electronic technology is part of this historical continuum. The use of computers in the creation of artwork is part of a recent futurist revival, or New Futurism.

In the beginning of the Modernist period, early in the twentieth century, a multitude of art styles developed, all of which revolved around either abstraction and denial of the illusion of three dimensions (which is now

being regarded as a search for the spiritual) or personal expression, much of which involved a nihilistic world-view. From Dada, Expressionism, Social Realism, Pop Art, and Environmental art to Neo-Expressionism, didacticism has reigned. All of these movements involve social criticism, especially of the mechanics of consumerism, and a pessimistic approach toward the future of mankind. In her review of the current exhibition of *Avant-Garde in the Eighties* at the Los Angeles County Museum of Art, critic Donna Stein writes:

The exhibition mirrors the confusion of the current art scene; almost nothing is soft, elegant or humorous. This art is agonized, shallow, cliché-ridden, pretentious or downright ugly. Unfortunately, too many of the works seem a product of small-mindedness, going for the slick throwaway or the quick take rather than exploring meaning.<sup>1</sup>

Computer art has been seen publicly since the mid-sixties in technologically advanced countries, where artists saw the computer as a possible source for artmaking. Computer artists are replacing Modernist concepts with new aesthetic qualities that relate to a strong belief in a future. Now that Nihilism has become a cliché, artists are again turning to new technologies in order to express the contemporary experience. Computer art can include



Margot Lovejoy  
**Azimuth XX -- The Logic  
Stage.** 1987

not just three but four dimensions, the fourth dimension being that of time.

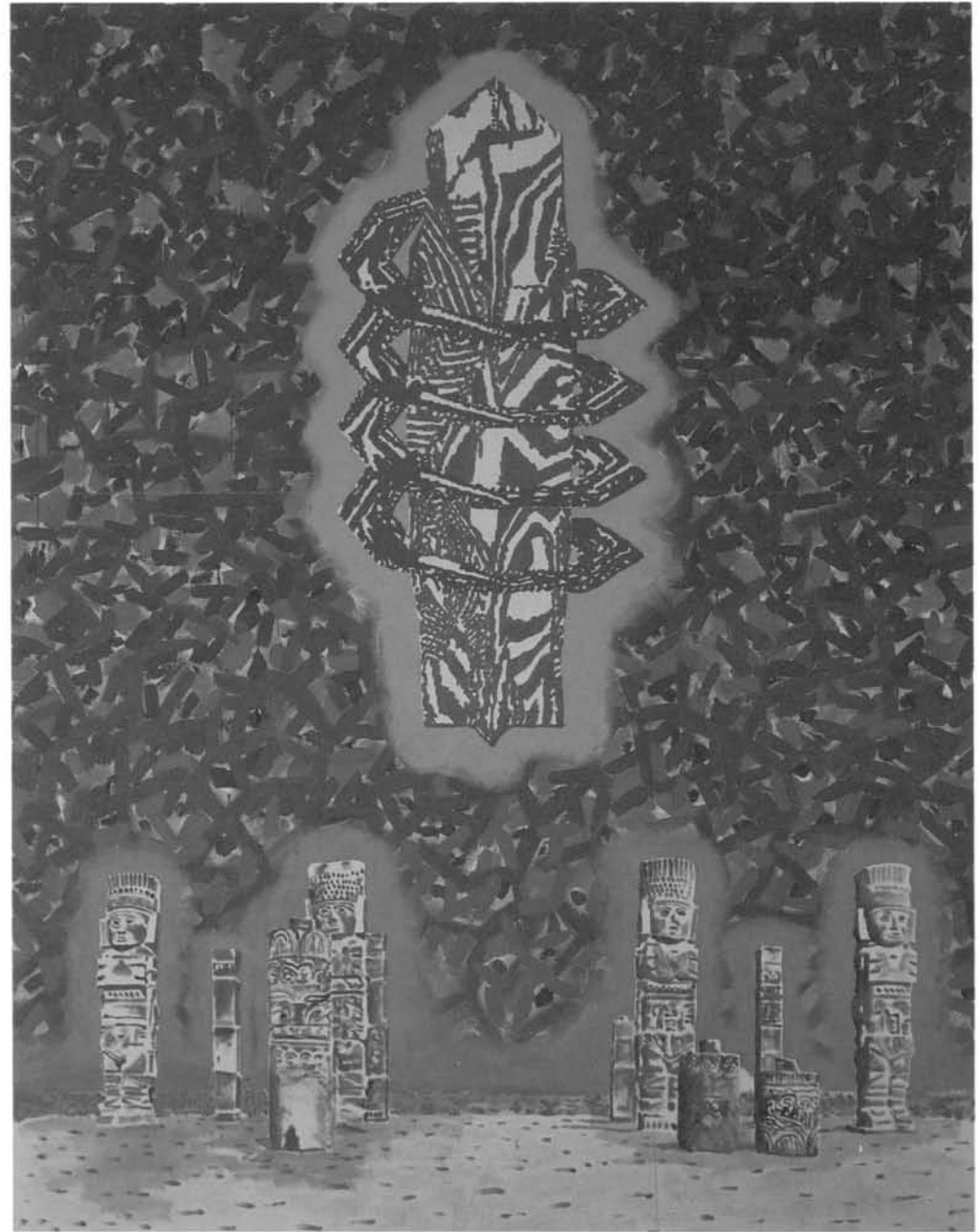
There are three ways in which artists use the computer. First, they use it as a tool, designing sketches, models or complete works of art, which are later transferred to conventional media.

Artists also use the complete computer system as a medium. These artworks are created to be viewed on a monitor and materialize as modeling or painting in light or involve devices driven by the computer, as in interactive artworks or environments.

The third way in which artists use the computer is as subject or inspiration for their visual research. They investigate how technology affects the human condition and how people relate to the computer.

This exhibition, **The Second Emerging Expression Biennial**, contains examples from all three categories of computer art. The distinctions between the categories are not always absolute. Some artists' works involve all three uses: the computer as tool, as medium, and as inspiration.

A number of artists whose works are shown in this exhibition use the computer as a sketching device. They draw and plan their designs with the aid of the computer. Because an image can be held in memory, artists are able to venture into the unknown,



Isaac Victor Kerlow  
**The Big Spiral. 1985-86**

no longer afraid to experiment for fear of ruining a work. Each effort, or state, can be kept as a sketch or as a segment in process. Tony Longson, for example, creates successive layers of patterns which he uses as a personal metaphor in his acrylic constructions. He is able to develop the precise geometric quality of his imagery quickly and fully because of the computer's ability to repeat tasks and is able to explore all of the logical consequences of an idea in a smaller fraction of time than it would take by other means. One of Longson's pieces in the exhibition, **Square Tonal Drawing**, (1986), exemplifies his interest in the logical representation of form and the nature of his visual investigations.

Rob Fisher, sculptor and Raymon Masters, computer scientist, collaborate to produce large-scale sculptural artworks which they plan, organize, and test with the aid of computers. The intricate designs and functional balance requirements are worked out before any production is begun. The site and budget requirements of some of their projects would preclude the quality of design and testing they are able to do with a computer. **Musical Instrument, Skyharp Series**, (1986), a fifteen-foot-high structure with dozens of free-hanging elements, is a diminutive example of their art. The individual elements hang from horizontal bars, moving when air currents fluctuate. Repetition of form is also a strong aesthetic element found in their work. This sculpture reflects light as the

metal units move, creating the appearance of a smooth wave. The wave was one of the earliest mathematical forms to be visualized on the computer and it has been incorporated into computer art since the 1950s.

The English painter Jeremy Gardiner adapts his small computer drawings or sketches based on manipulated images as studies for his larger oil and acrylic works. The focus of Gardiner's work, however, is the affect of technology on our lives. He studied at the Royal Academy in London and began his artistic career by accepting support from, and access to, industrial environments. Recently Gardiner finished a term as artist-in-residence at the Massachusetts Institute of Technology, where he worked at the Visible Language Workshop. In 1985 he created a video entitled **Behind Appearance** and a series of portraits that resemble CAT-scan photography and relate to Pop icons of the 1960s. The titles of his newest series of paintings, in this case **Jester** (1986), refer to the anonymous talking heads seen constantly in news programs on TV screens around the world. Gardiner writes: "The image of the frame buffer exists as transmitted light; the translation of these characteristics to canvas and the world of reflected light remain the fundamental 'technical details' of these works." <sup>2</sup> Gardiner takes advantage of the computer's ability to distort and transform shapes, which relates back to and is important in terms of the

content of his works. He also experiments with the computer to manipulate "colouristic alternatives" for his investigations with paint.

John Pearson also uses the computer to make drawings for his constructions and paintings. In his installation, **Remembrance #3** (1986), Pearson's interest is in color and how it relates to form. Pearson restricts the shape of his forms to allow free access to color expression. He creates hundreds of sketches on the computer following the sequence of logic and of imagination in his search for perfection. He says: "I believe the major difference the computer offers as a tool is that it presents the artist with very accurate alternatives, variations, to the original image while remaining solidly embedded within the parameters of the main concept." <sup>3</sup> His constructions are made up of geometric configurations that seek equilibrium between mass and color, based on the classical proportions of the Golden Section.

Norman Zammitt uses the computer as a tool to help him calculate and track the vast numbers of colors required to create his large-format acrylic paintings. Some years ago, Zammitt wrote computer programs to help him visualize the relationships between hues as they exist in paint. He started using a computer to notate his formulas for mixing pigments, finding that it saved him hours of laborious calculations (as witnessed in his early notebooks), and eventually developed programs that

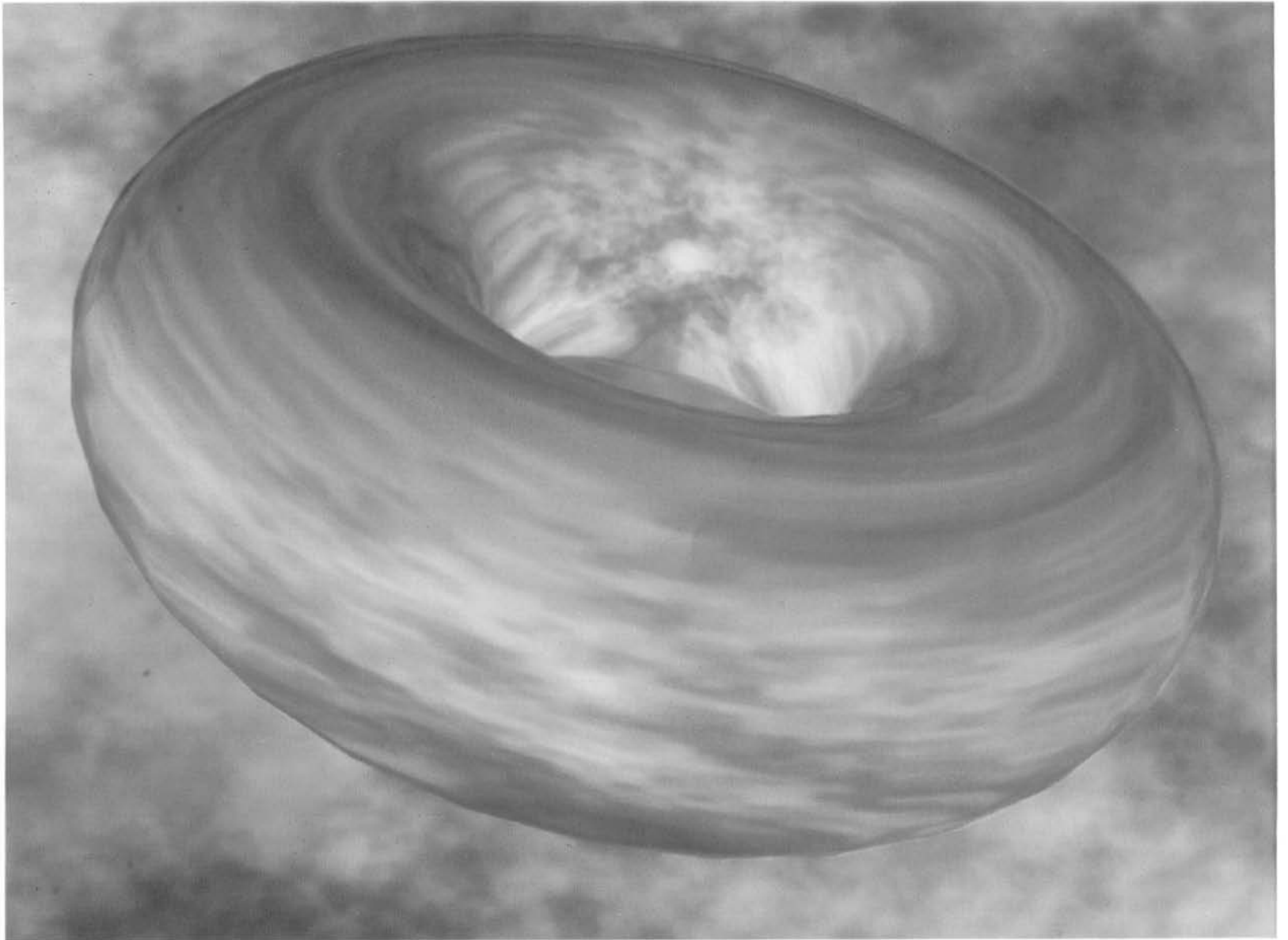


John Pearson  
**Remembrance #3**. 1986

help balance the finite gradations that determine the exact relationships in intensity and hue between a color and its neighboring color. **Caly-Forny-Ay** (1987), is an example of a painting that has several hundred formulas and illustrates Zammitt's interest in color as a means of spiritual expression. An interest in color and color changes is one of the strongest elements found in computer art. Theoretically, sixteen million colors can now be reproduced exactly with a computer system. Colors and color transitions that were once difficult to visualize are now being created easily with color maps by artists using computers. However, Zammitt doesn't need the color map; he is able to capture in paint the luminosity associated with color seen on a monitor without using the screen as a prompter.

Glenn McQueen's **Monet's Breakfast** (1987), and Patricia Search's **Rhapsody in Time** (1986), are examples of artworks that are best viewed on monitors. The complete computer system is used as a medium. The quality of the luminosity and intensity of colors found in this medium is unique. These artists are painting in light. They both use a synthetic form of imagery, created by mathematically modeling three-dimensional forms. McQueen uses various rendering techniques developed at the New York Institute of Technology. Search says that although commercial ready-made paint programs are available, "it is the





Glenn McQueen  
**Monet's Breakfast.** 1987



Patricia Search  
**Rhapsody in Time.** 1986



quintessential complexity of ray tracing that attracts me." <sup>4</sup> This is a technique that gives the illusion of actual forms in space allowing artists to manipulate them to create an artificial reality.

Ilene Schuster's Cibachromes have an otherworldly appearance which, combined with her titles, reflect her interest in New-Futurism. Bursts of high-keyed color radiate from total darkness to illuminate digital patterns in Schuster's artwork. "To work with the computer is to examine that nebulous area beyond and within the monitor which acts as a telescope to reveal the essence of our time and our future,"<sup>5</sup> Schuster says.

**Passages** (1985), is an example of a work that could be appreciated directly on a monitor; however, she transfers the image to the photographic medium to retain the quality of the light for gallery presentation.

**Lovit 2** (1987) is one of David Em's newest computer works, which he originally designed to be viewed on the monitor but has translated to paint. It is a formal composition relating to the nature of tonal gradations that define the modeling of abstracted mathematical shapes. Em's computer artwork has always had a universal, futuristic quality with an approach to form that uses many elements from computer art, including repetition of forms, transformations, texture mapping (the ability of the computer to wrap a "skin" around the surface of an object), representation

of an artificial reality, and intense coloration. This painting reveals Em's long-standing interaction with art and technology. He first began to use a computer in the production of artworks in 1975 and has recently returned to painting, for which he trained at the Pennsylvania Academy of Fine Arts. Em's recent aesthetic experiments with color values have expanded his means of personal expression.

Dan Sandin's career has paralleled the development of modern video technology. He has a strong technical background and his experimental videos have been widely exhibited. The collaborative work, **Apollo** (1986), is part of a series of computer-generated "phscolograms", which utilize a true three-dimensional display medium similar in appearance to holography but using a different technology. These images were created by the (Art)<sup>n</sup> Lab a consortium of artists which includes Sandin, at the Illinois Institute of Technology. A large percentage of computer artists have an interest in creating images that appear three-dimensional, and this movement is part of the rejection of Modernism. Sandin's use of this medium is connected to his involvement with the illusion of reality and optical motion. There is in these digital forms a combination of the qualities of geometric hardness and softness that has been part of a visual vocabulary associated with computer art. Combined with movement or a change of perspective, these works embody the dynamics of the contem-

porary computer-art experience.

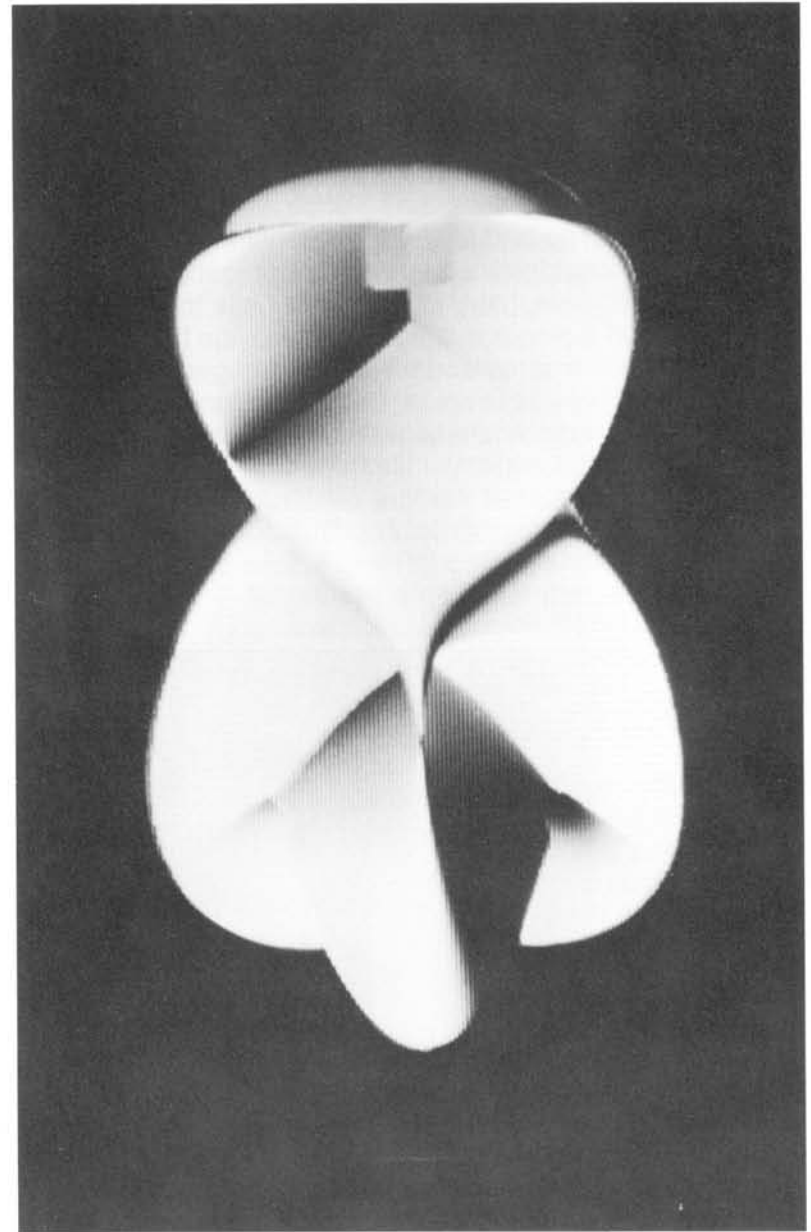
Artists use the computer as inspiration for the content as well as the context of their works. Mark Wilson works with the aesthetic forms associated with the information age. His artworks deal not only with the computer as a source for his formal researches, but also with how the computer affects our lives. Using the complete computer system as medium and the computer as subject, he provides a basis for defining form as it relates to technological tools. Wilson defines problems in terms of programming solutions and creates forms exclusive to the medium. Wilson wrote his programs to enable his plotter drawings to go directly onto canvas. His work, **NAC L17** (1986) is made up of intersecting groups of geometrically based forms and are reminiscent of the Futuristic architectural drawings of Sant 'Elia, or, of gazing down at some urban plan from another reality.

Michael Brakke works with the ScanMural as medium; it is a computer-controlled spray-paint process that produces an image from transparencies on a rubber-vinylized fabric. **I Am Scared** (1984), is large in format, and refers to personal icons as well as to modern technology. "I began work with . . . a readily available 'home computer' because I wanted to avoid the 'Corporate/ Institutional Enterprise Syndrome' of work which engages current technologies," says Brakke. "What software I tried seemed for the most part a rather feeble imitation of the

hand, and to use a computer to imitate the hand drawing process seemed beside the point. . . . I program in Basic and. . .the interactive nature of Basic provides me with the best sense of engaging the machine in a linguistically conceptual manner." <sup>6</sup> His work consists of superimposed icons, figures, and a water tower, all of which were mathematically "written" and relate to the basic picture unit of a computer, the pixel. The tower is defined by graph lines in a three-dimensional image that refers to the programming process dealing with hidden lines.

Most of the artists participating in this exhibition make reference to those form metaphors associated with the computer. Eileen Zegar states, "The utilization of the pixel as the mark within a rigid grid-matrix system cannot be disregarded when creating within this medium."<sup>7</sup> In her drawing, **Human Face** (1986), the print-head skips were "consciously encouraged" and became part of her creative language.

Colette and Charles Bangert have been working with computers since 1967. From their first work titled **Landscape Coils** (1967), to the present selection from the **Katie Series** (1987), they have investigated the nature of form as inherent in computer drawing. "We use a computer to make drawings and to help us understand the drawing process. . .," they explain. "Some artists have to work to generate ideas. For some the images come first, then



(Art)<sup>n</sup> Laboratory  
(Donna Cox, Tom De Fanti, George Francis, Ray Idaszak, Daniel John Sandin, Ellen Sandor)  
**Apollo**. 1987

the ideas."<sup>8</sup> Charles Bangert says that "software is our medium." Their research investigates the nature of visualizing mathematical models and the application of the successful results to their drawings.

Robert Mallery was a well-known sculptor when he first approached computers in 1967. He uses the computer as a tool to provide the impetus and means for images which are built-up as studies in lyrical color combinations with contrasting asymmetry. He frequently creates collages that are constructed photographically. **Suburbia** (1986), is a photoprint from a suite of works that make up a sequential

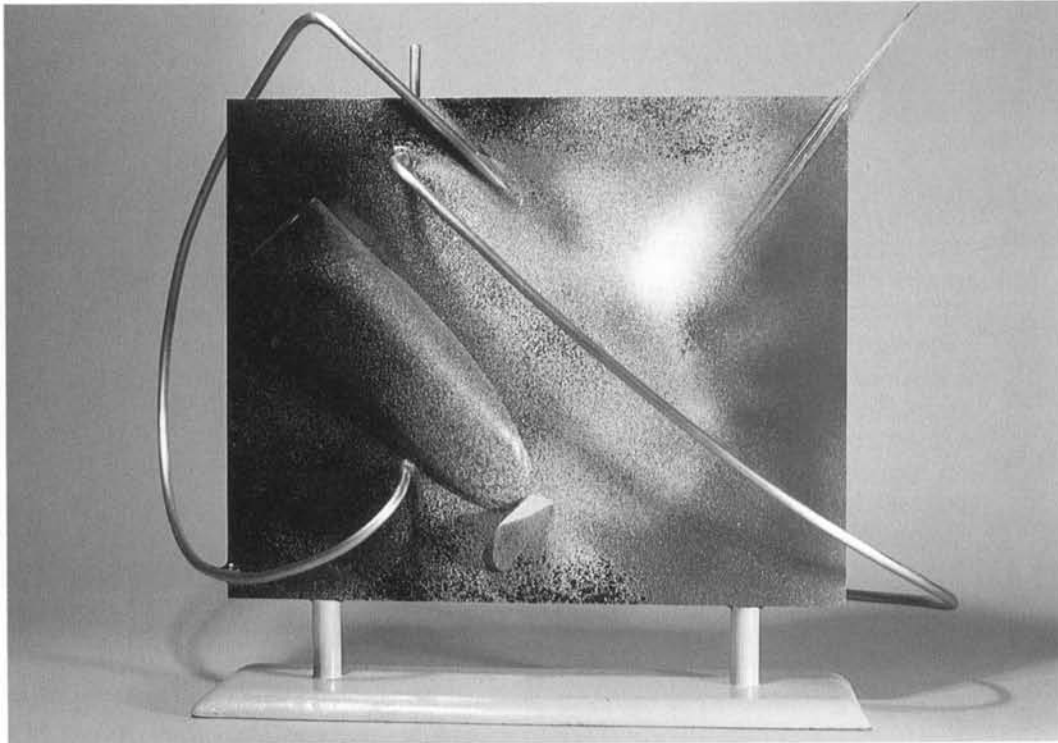
presentation. Mallery favors serial structures in the form and the process of creating his artworks. His art is strong and concrete, reflecting his plastic interests while still demonstrating a digital origin. "As for the distant future," he says, "I remain convinced that computer art is headed toward a 'supermedium,' a fantastically powerful technology. . . This medium-of-the-future will be at once computer-based and illusory-projective, capable of a full gamut of imagery. . . it will allow what we now call mobile sculpture to realize its full potential by liberating it from its fatal over-dependence on physical materials and mechanical contrivances. . ." <sup>9</sup> Mallery believes

that technology should expand our ability to understand and appreciate all art forms, and he refers to this concept as "Total-Art."

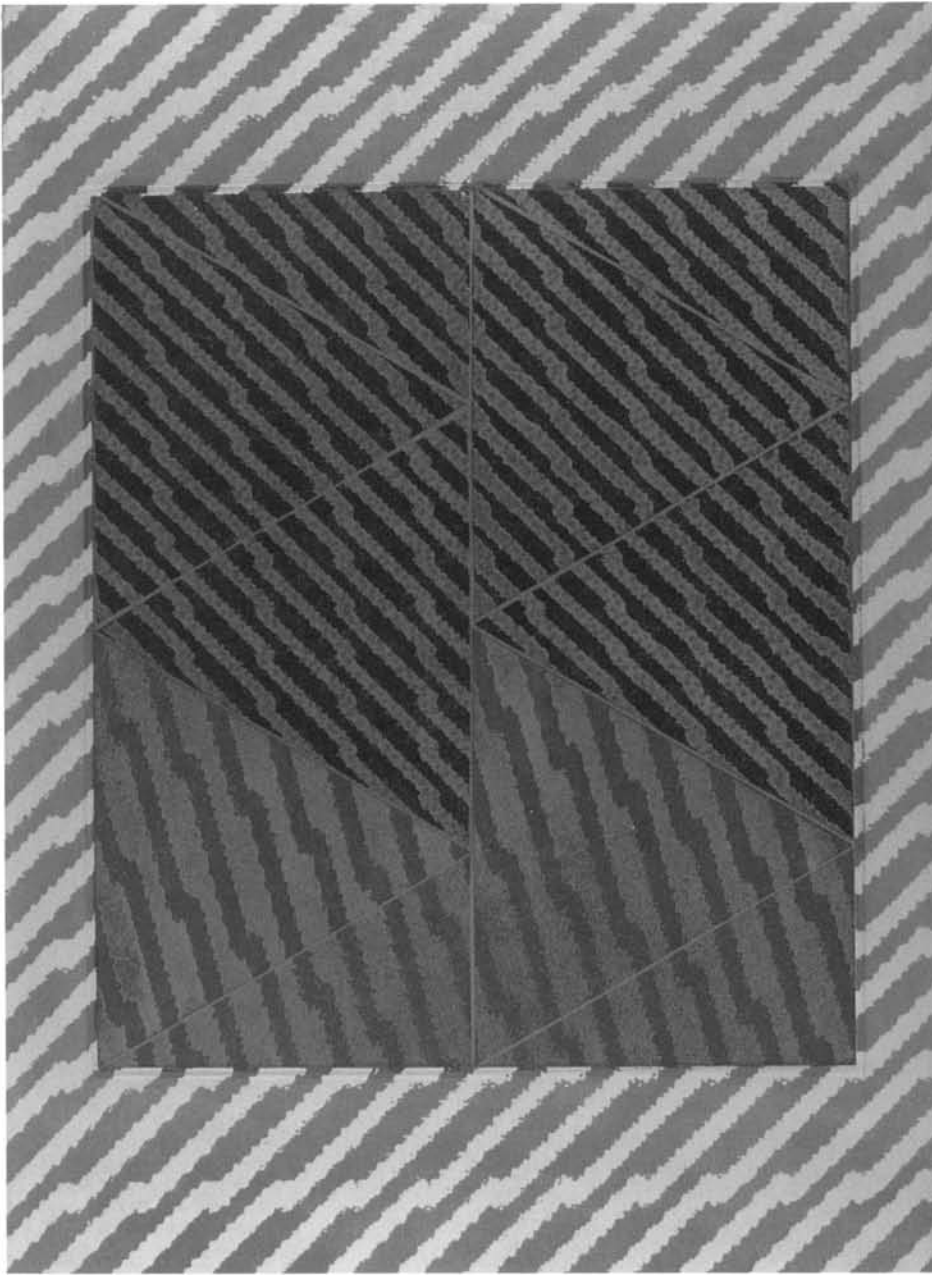
Another work that reflects its digital origin is Donna Cox's **Window I** (1985), a "comulage" of photographic images. The dynamic movement and intense color encompasses synthetic forms in rhythmically charged formations. This futuristic work aligns itself with other worldly images and scientific simulations.

Mel Alexenberg's work is part of the Appropriation Art movement centered in New York. **Digitized Homage to Rembrandt: Jacob's Dream** (1986) was created from a series of digitized and restructured images based on Rembrandt's drawings. The resulting works have been etched with aquatints. Alexenberg feels these expressive transformations "invite us to look for the spiritual within the material worlds of computer labs and supermarkets."<sup>10</sup> Video and computer technology speeds up the process that allows artists to incorporate Old Masters' works into their own artworks.

Both Manfred Mohr's and Jürgen Lit Fischer's purist artworks have a strong philosophical basis and an inclination to follow the logical



J. Michael O'Rourke  
**Images of Ourselves - Diana. 1986**

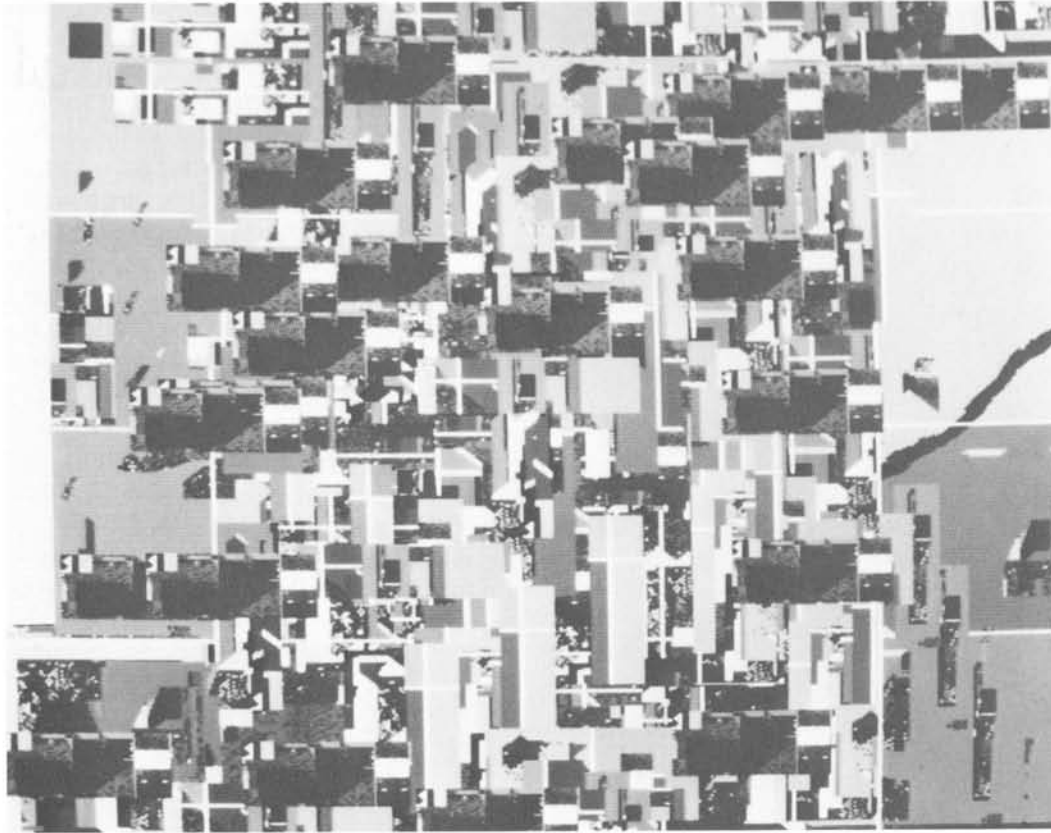


Steven L. Mayes  
**Spotted Harlequin.** 1986

consequences of formal development. Mohr's work, **P-397 A** (1986), is one example from a long series he produced using the cube as a visual source. The flat geometrical shapes are formed as a result of dividing the cube. This large wall structure is made of wood and cardboard. Mohr's meticulous constructions and drawings evolve from an interest in mathematics and in the computer program as a design element. He creates artworks of precise refinement and structural elegance. Jürgen Lit Fischer's painting, **See Piece** (1987), refers to electronic light as it is seen on the monitor. "The central theme of my work is light, with its natural-physical properties and its synthetic analogies,"<sup>11</sup> Fischer says. He composes linear elements in measured oscillations that vibrate optically and expressively.

One of the concepts that binds computer artists together is their approach to artmaking. Twentieth-century artists tend to create by using their experiences as the basis for content or meaning in their art. Each piece of work is a compilation of an artist's life experience and builds upon his most recent work in an ongoing development of style or metaphor. The treatment of form in art (the metaphor) is unique to an artist's experience. When artists work with a computer program, it changes how they approach artmaking. Artists can no longer commence a work with the total composition when using the computer. They are forced to analyze the individual shapes or processes





Robert Mallery  
**Suburbia.** 1986

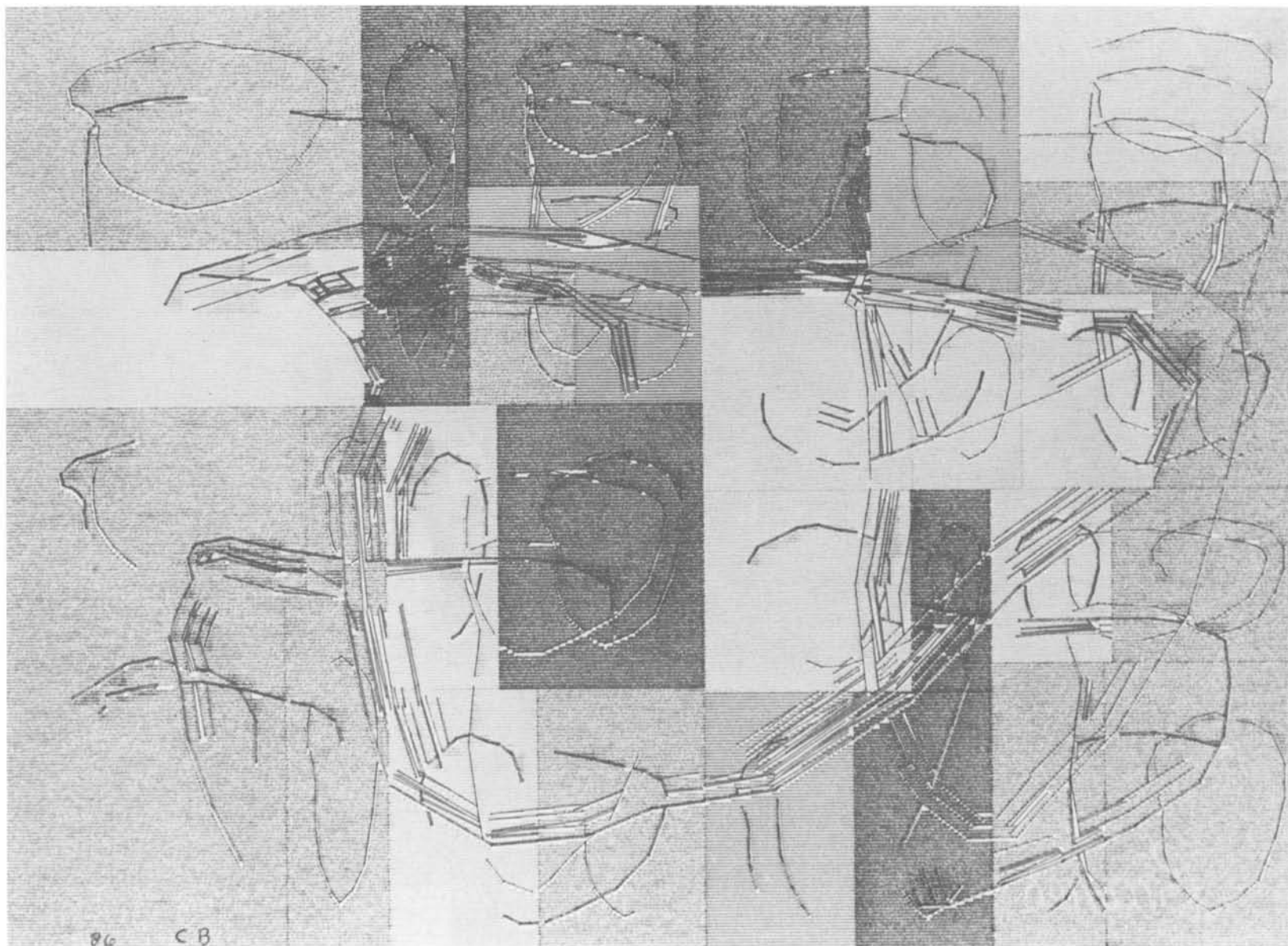
used to create the work first, and only then can the structure evolve. This is similar to the scientific approach to research which can be described as "divide and test"; in other words, areas of knowledge are broken down into provable modules.

In sum, these artists study forms in terms of individual algorithms and create metaphors related to the computer and its impact on civilization.

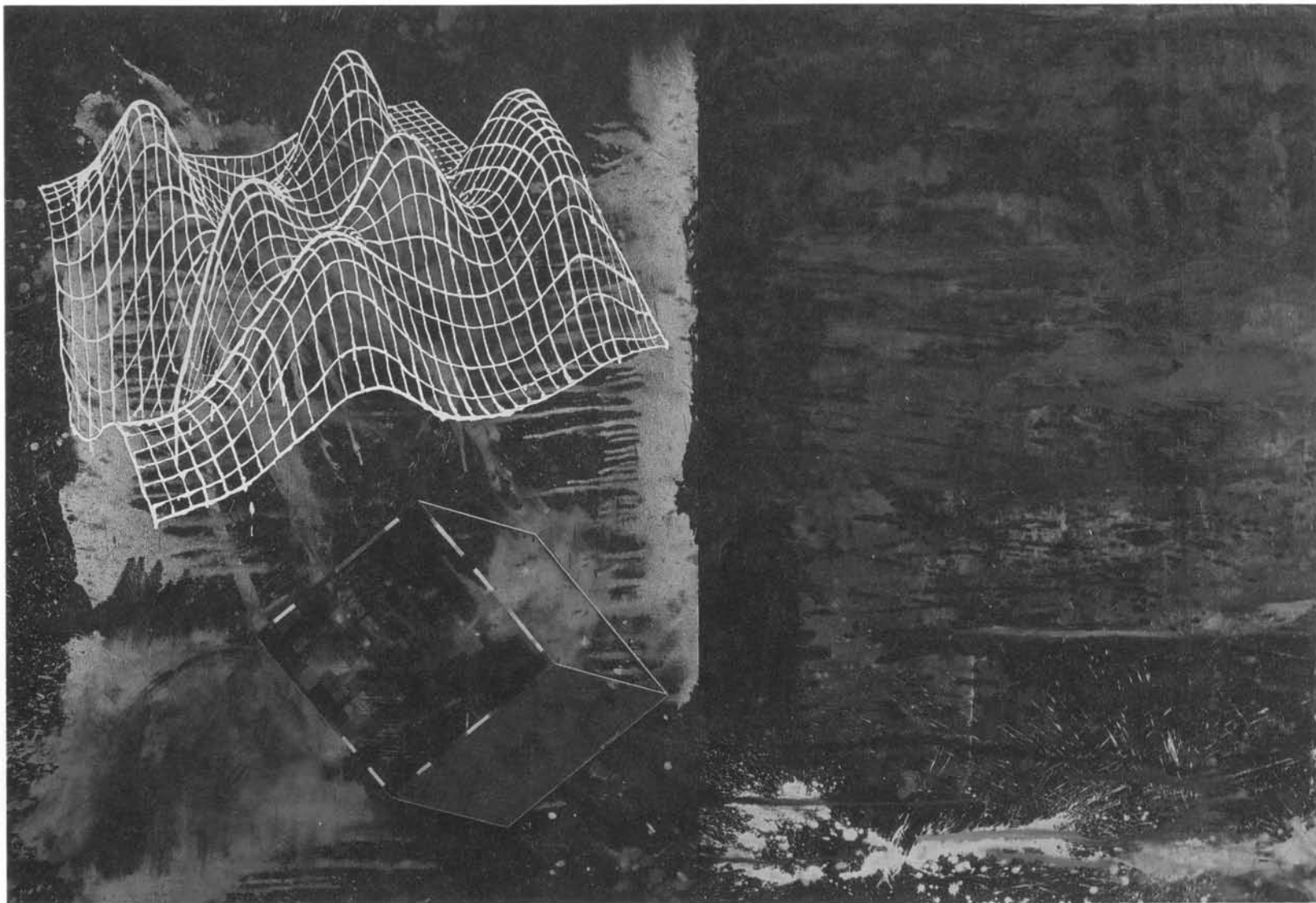
Patric Prince

## Notes

- <sup>1</sup> Donna Stein, "An Avant Garde in the Past Tense," *Artweek*, (June 6, 1987), p.1.
- <sup>2</sup> Jeremy Gardiner, letter to the author, (February, 1986).
- <sup>3</sup> John Pearson, "Artists Comments," *Paintings/Constructions 1985-1986*, (Bertha Udang Gallery, New York, 1986), p. 6.
- <sup>4</sup> Patricia Search, letter to The Bronx Museum of the Arts, (January 5, 1987).
- <sup>5</sup> Ilene Schuster, artist's statement to the The Bronx Museum of the Arts, (January, 1987).
- <sup>6</sup> Michael Brakke, letter to The Bronx Museum of the Arts, (January 25, 1987).
- <sup>7</sup> Eileen Zegar, artist's statement to The Bronx Museum of the Arts, (January 12, 1987).
- <sup>8</sup> Colette and Charles Bangert, "And More Questions and Answers for Our Friends," (unpublished paper, February, 1982), pp. 1-6.
- <sup>9</sup> Robert Mallery, "My Nineteen Years with the Computer: A Summary and a Prediction," *The Visual Computer*, (Springer - Verlag, Berlin, FRG, 1986).
- <sup>10</sup> Mel Alexenberg, artist's statement to The Bronx Museum of the Arts, (December 18, 1986).
- <sup>11</sup> Jürgen Lit Fischer, "Artist's Statement," *Artware, Kunst und Elektronik*, (Eine Ausstellung de Siemens AG, Hannover, FRG, 1987).

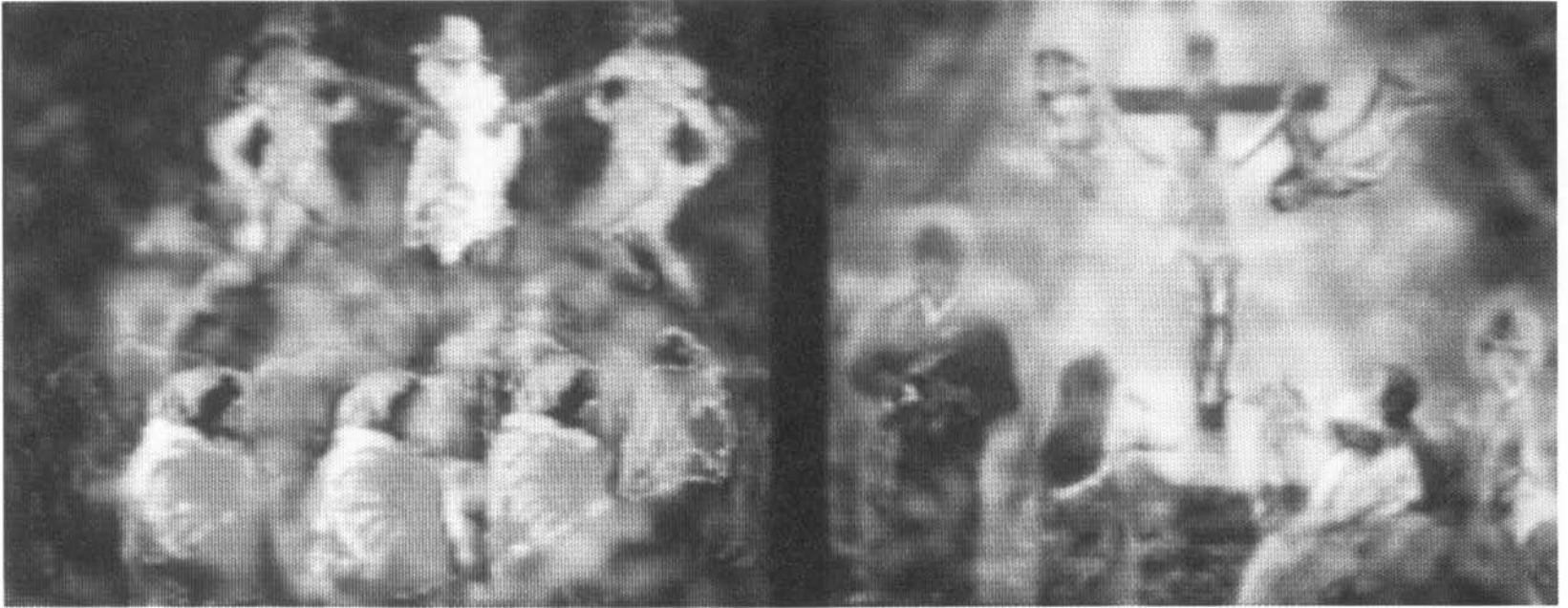


Colette and Charles Bangert  
**Katie Series: Field**  
Greyed. 1986



Steve Miller  
**Erased Permanently in an  
Instant.** 1986





Carlos Arguello  
**Androgyny Audience,**  
**Crucifixion.** 1986

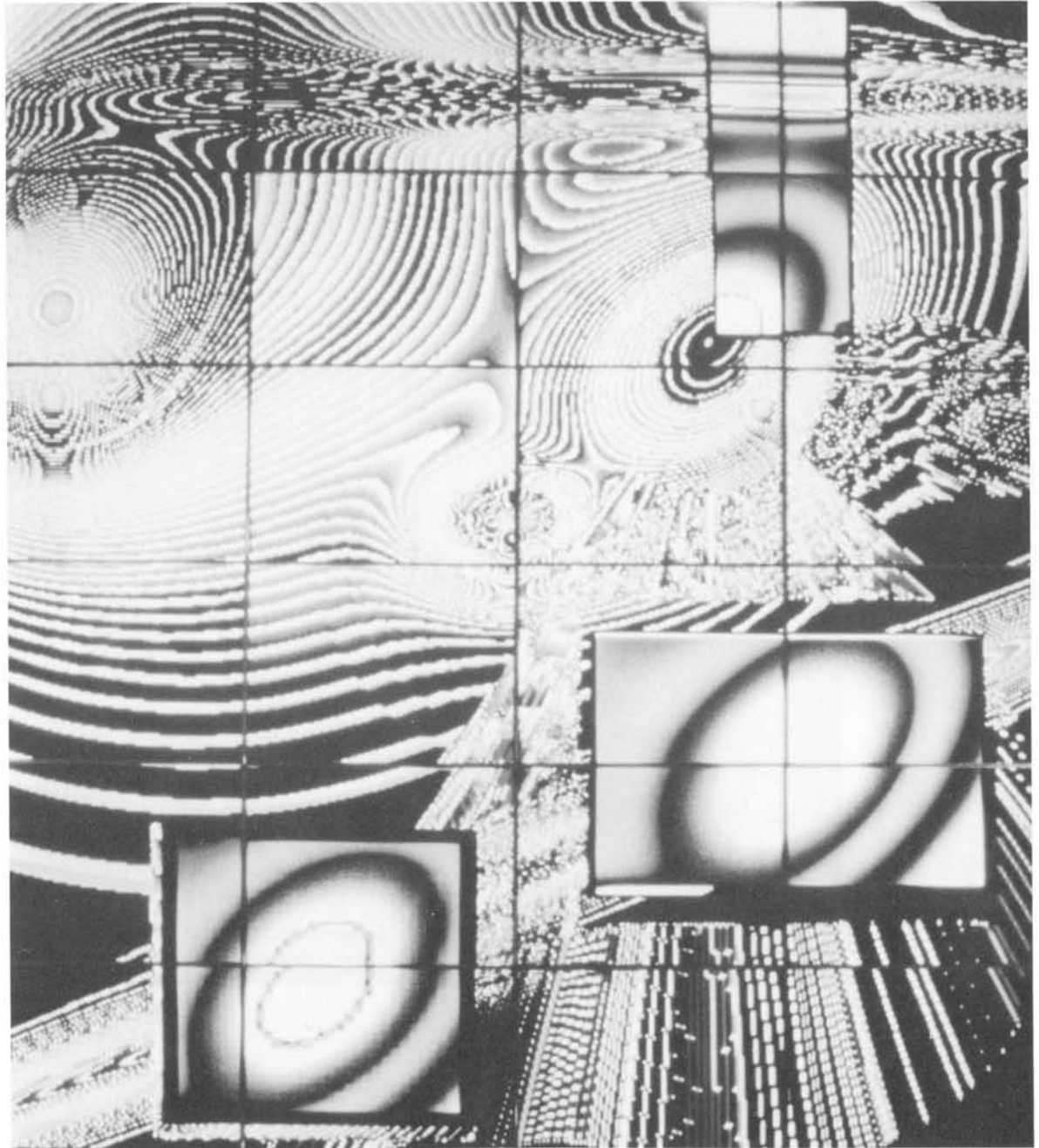


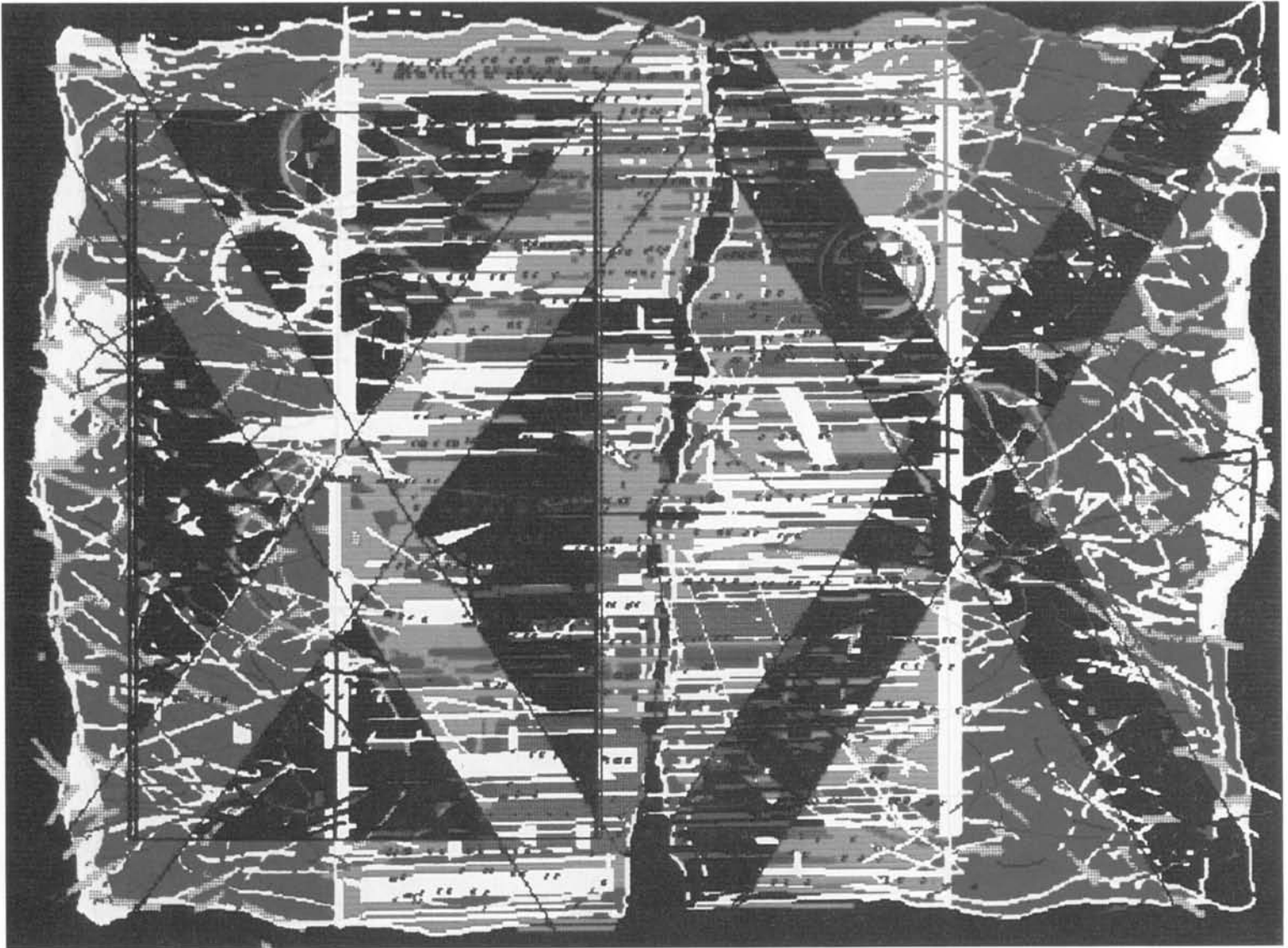
Robert Martin  
**Tinat #4.** 1985



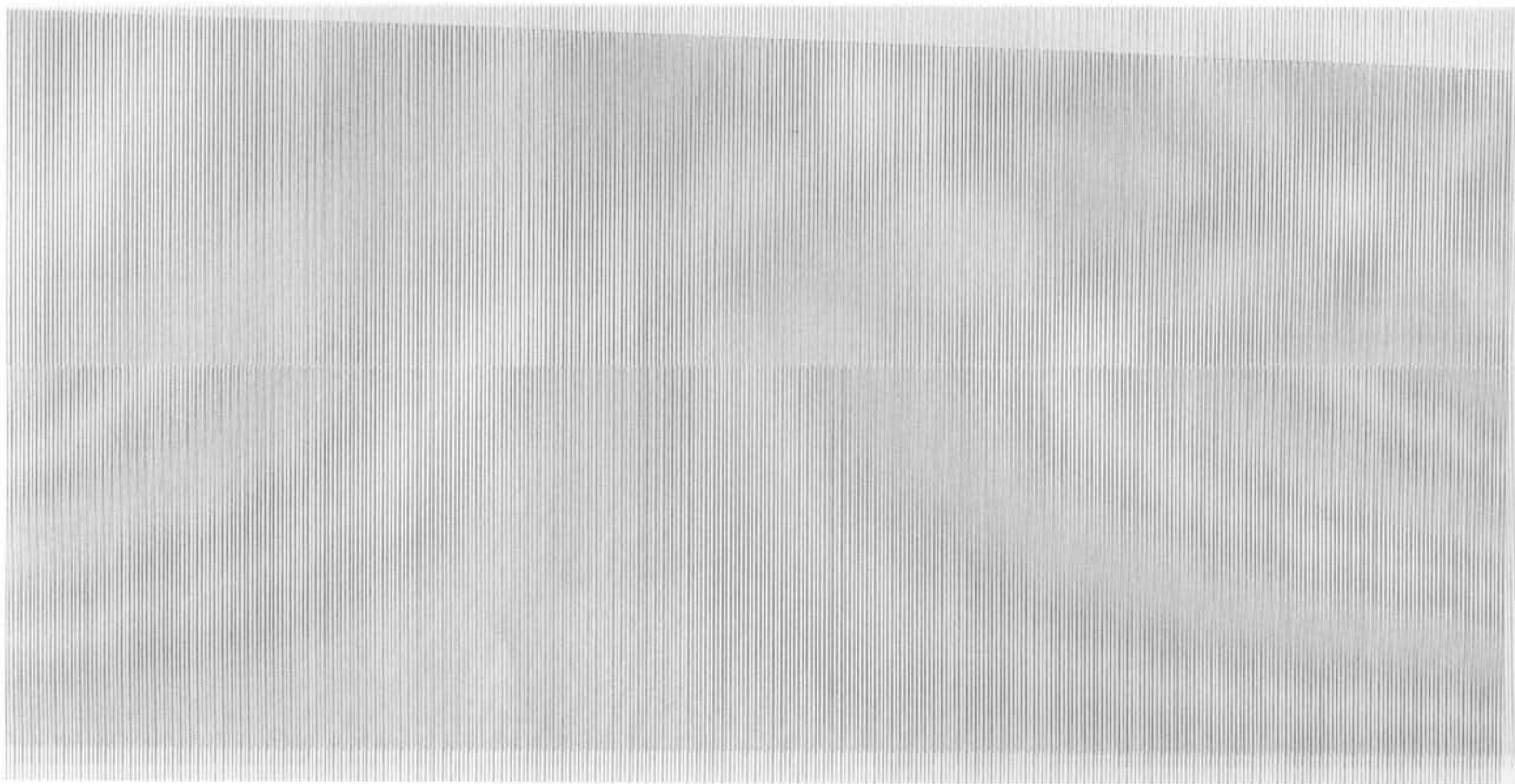
Mel Alexenberg  
**Digitized Homage to  
Rembrandt: Jacob's Dream.**  
1986

Donna J. Cox  
Windows I. 1986





Karen Guzak  
**Ibis 18.** 1986

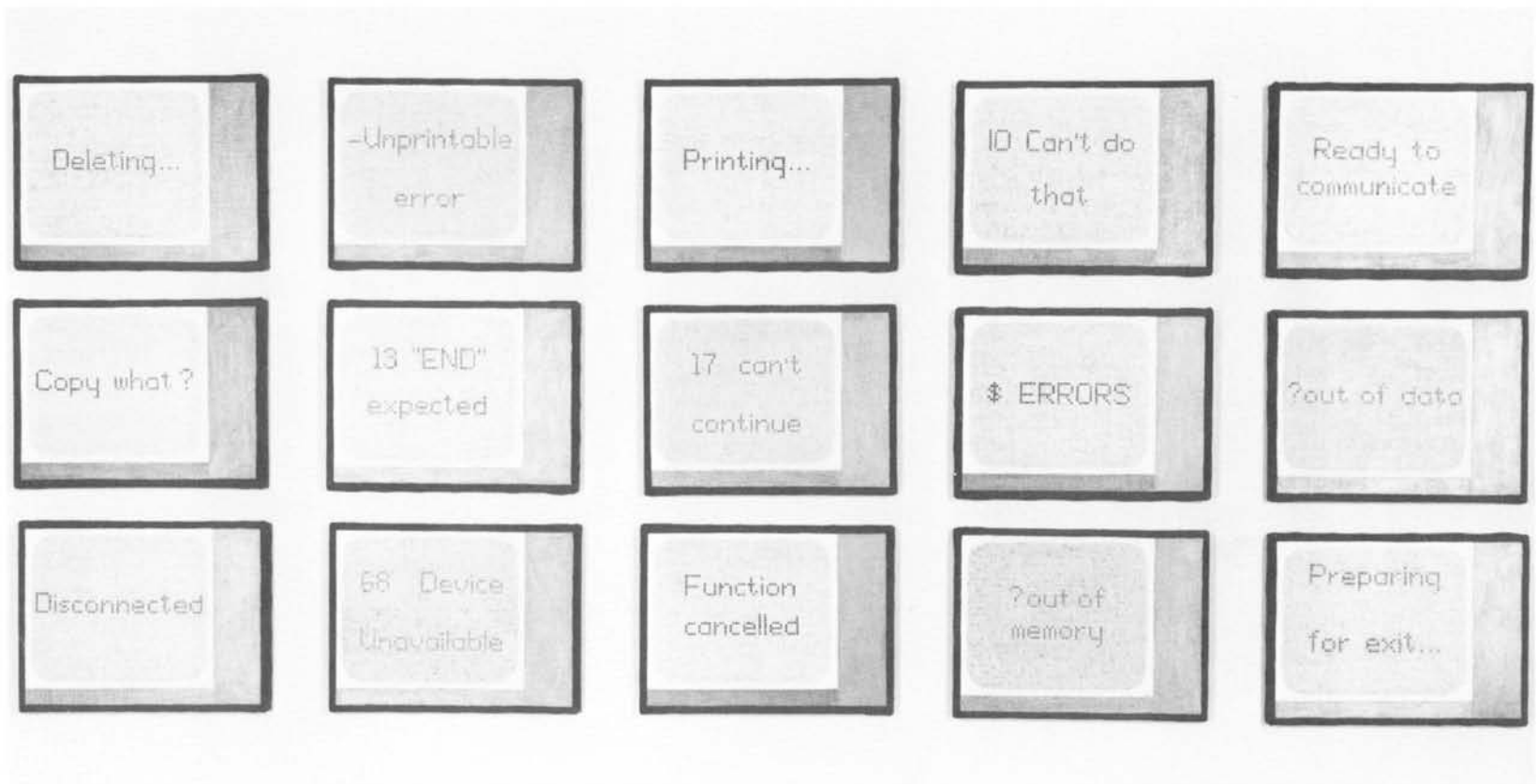


Eudice Feder  
**Arctic Flame.** 1986



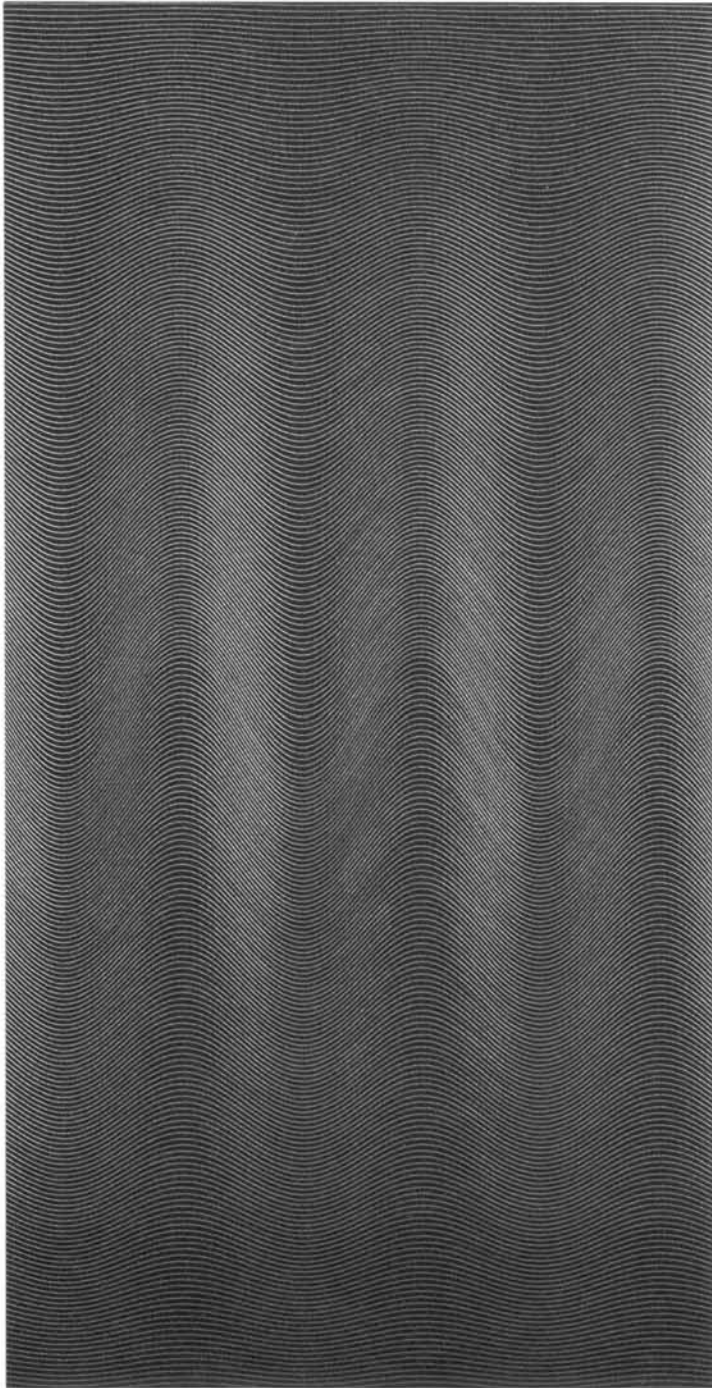
Rachel Gellman  
**A Woman of Stature.** 1986



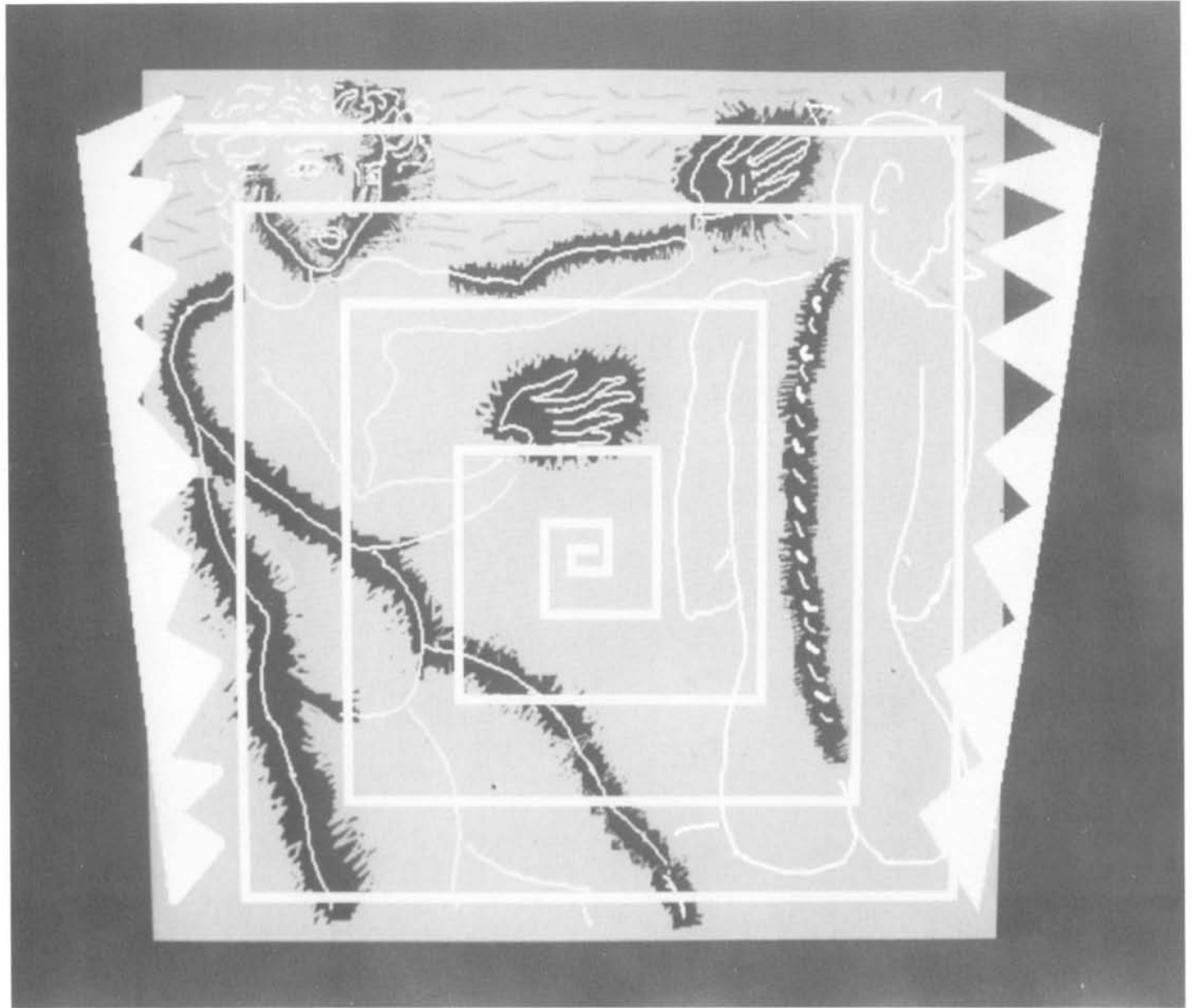


Mimi Smith  
**Error Messages.** 1986-87

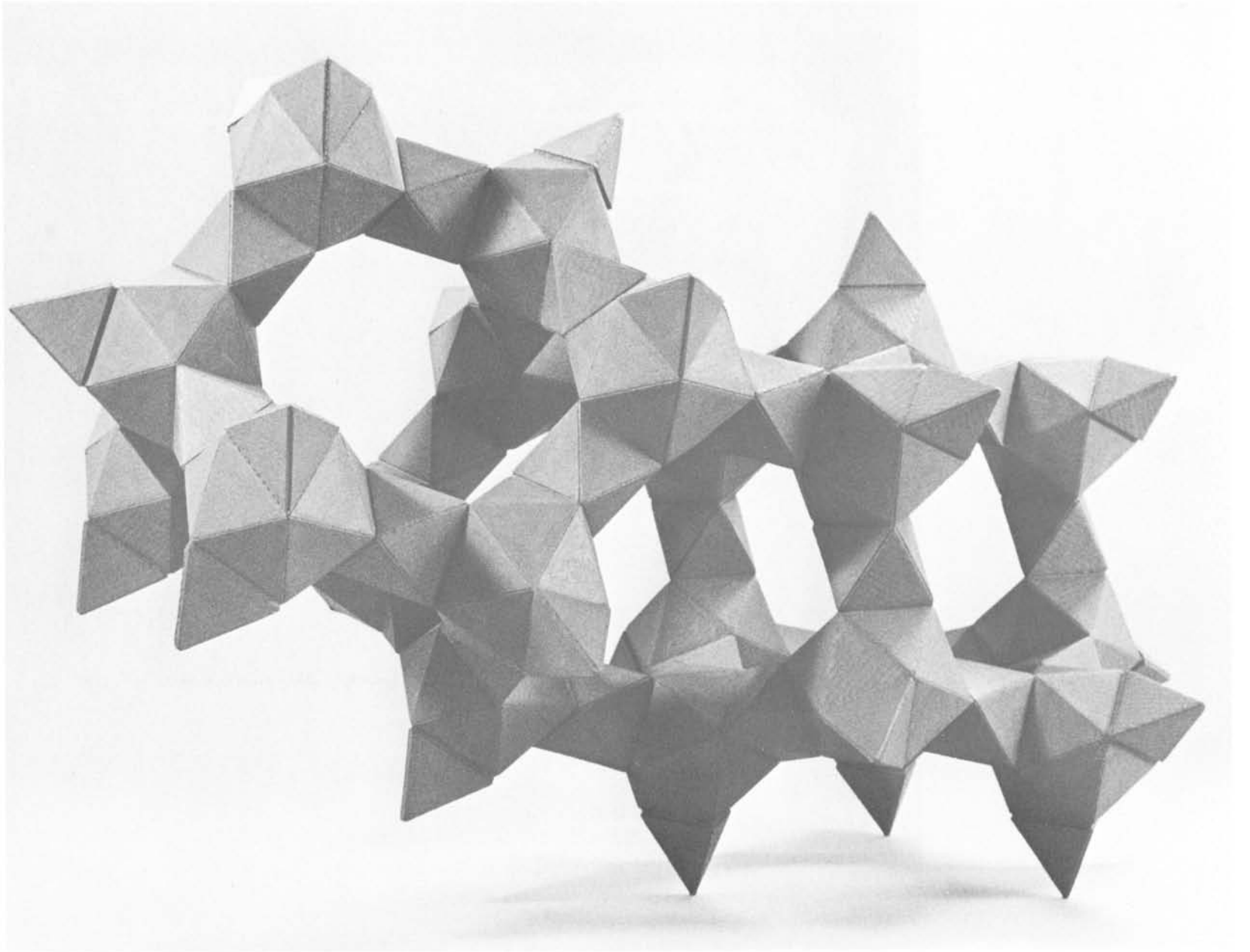




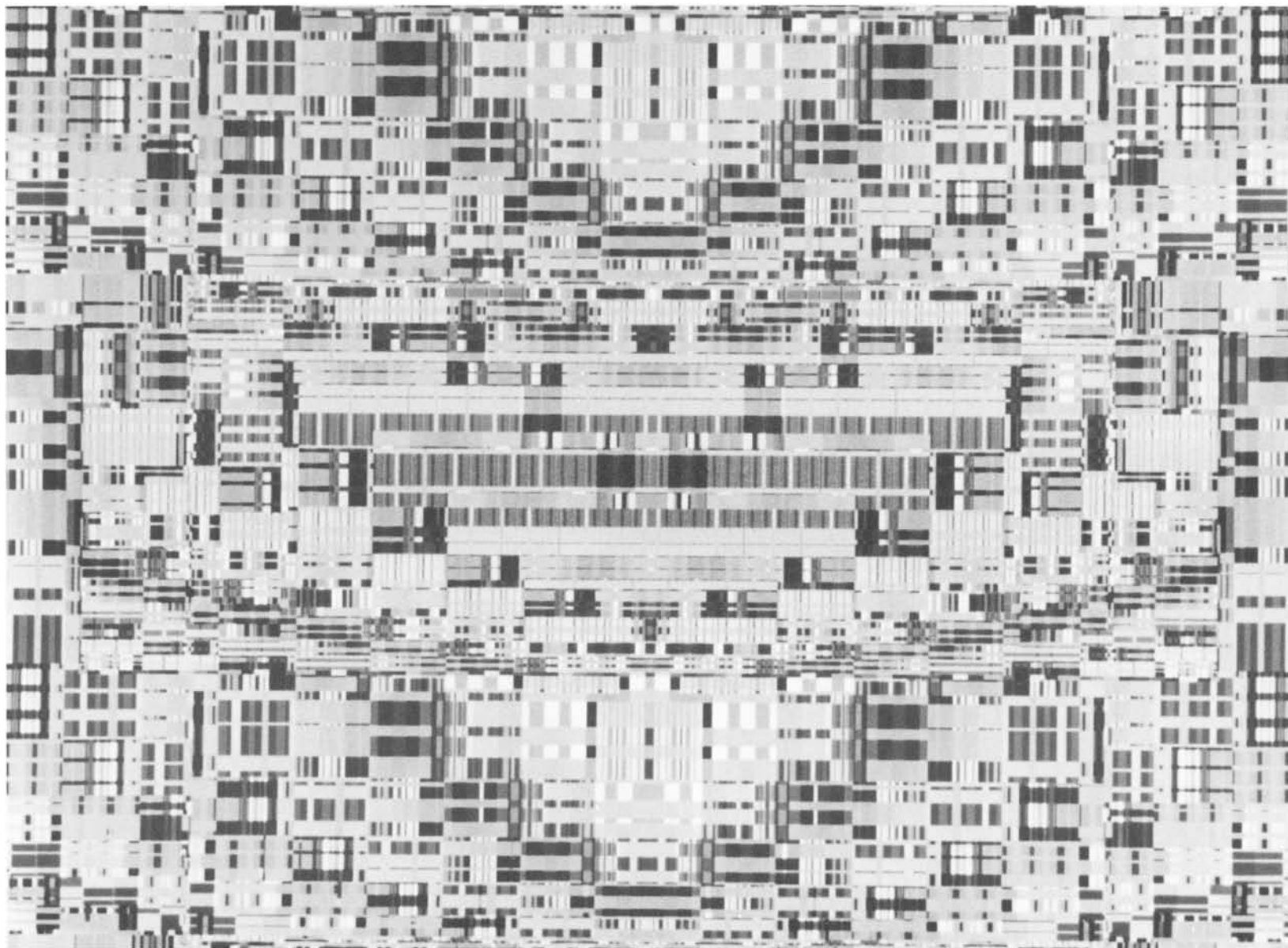
Jürgen Lit Fischer  
**See Piece.** 1987



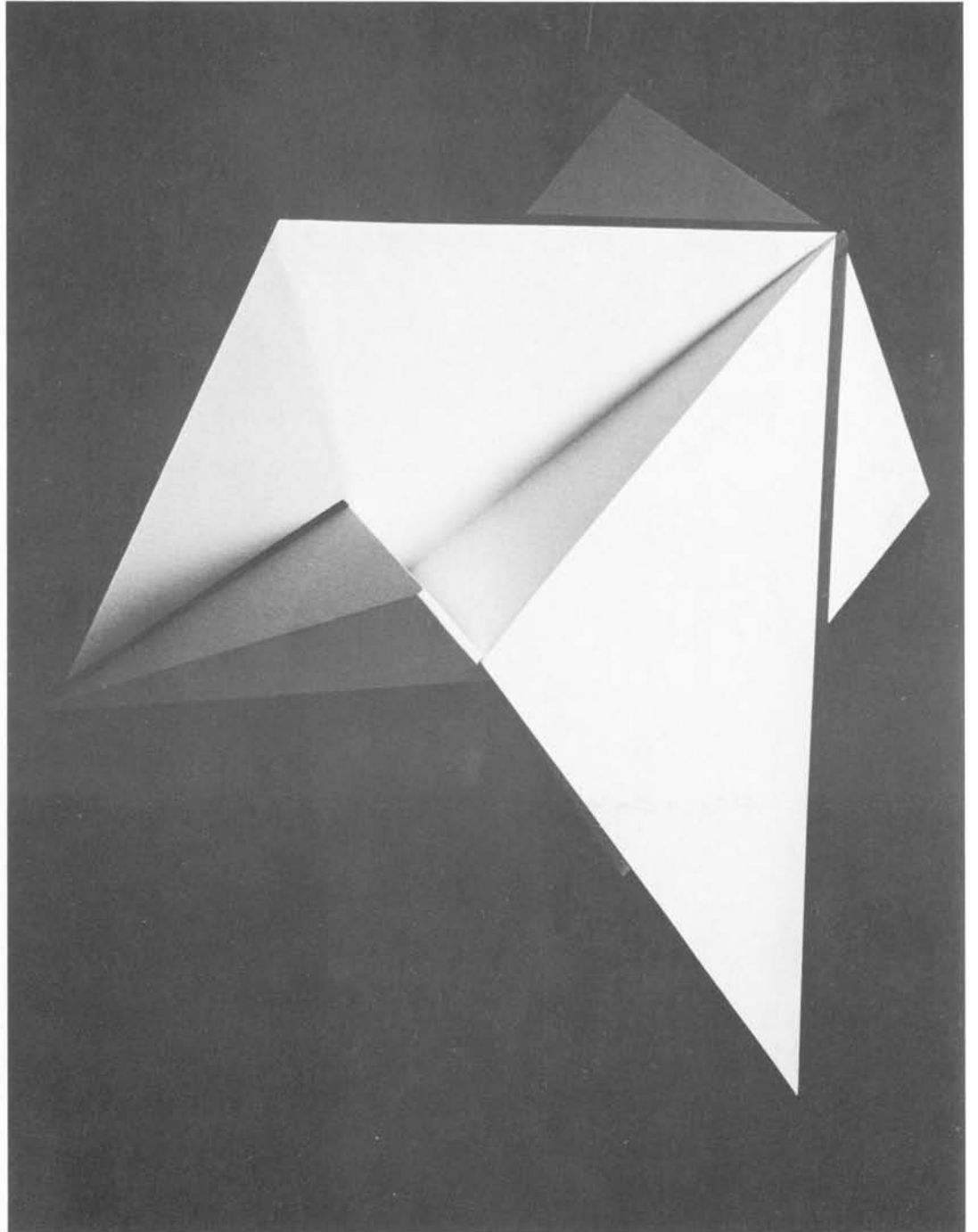
Barbara Nessim  
E198. 1985



Robert E. Dewar  
**Diamond Seed.** 1986



Terry Blum  
Square One #16. 1986



Ruth Leavitt  
**Sculptural Relief II.** 1986

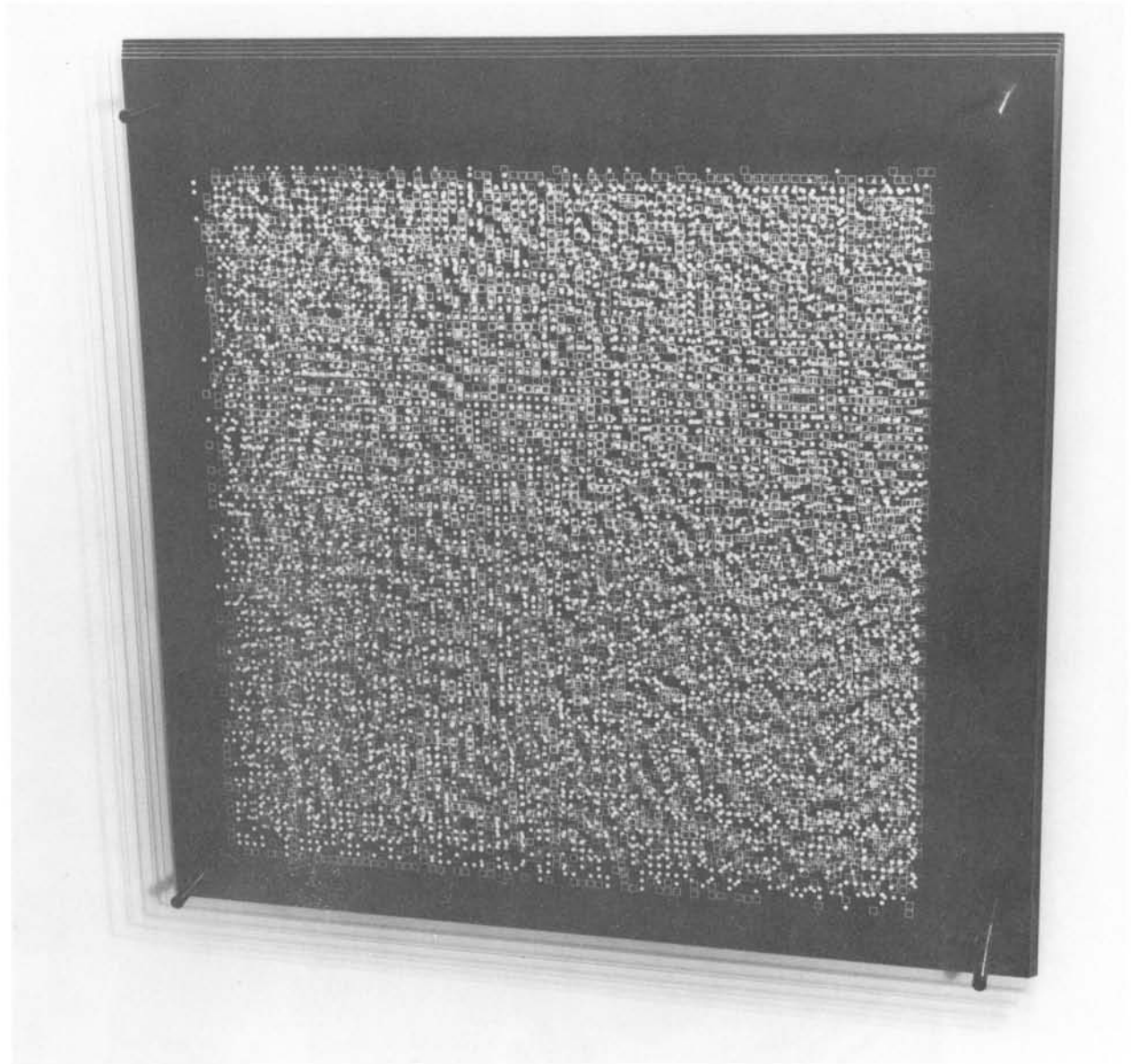




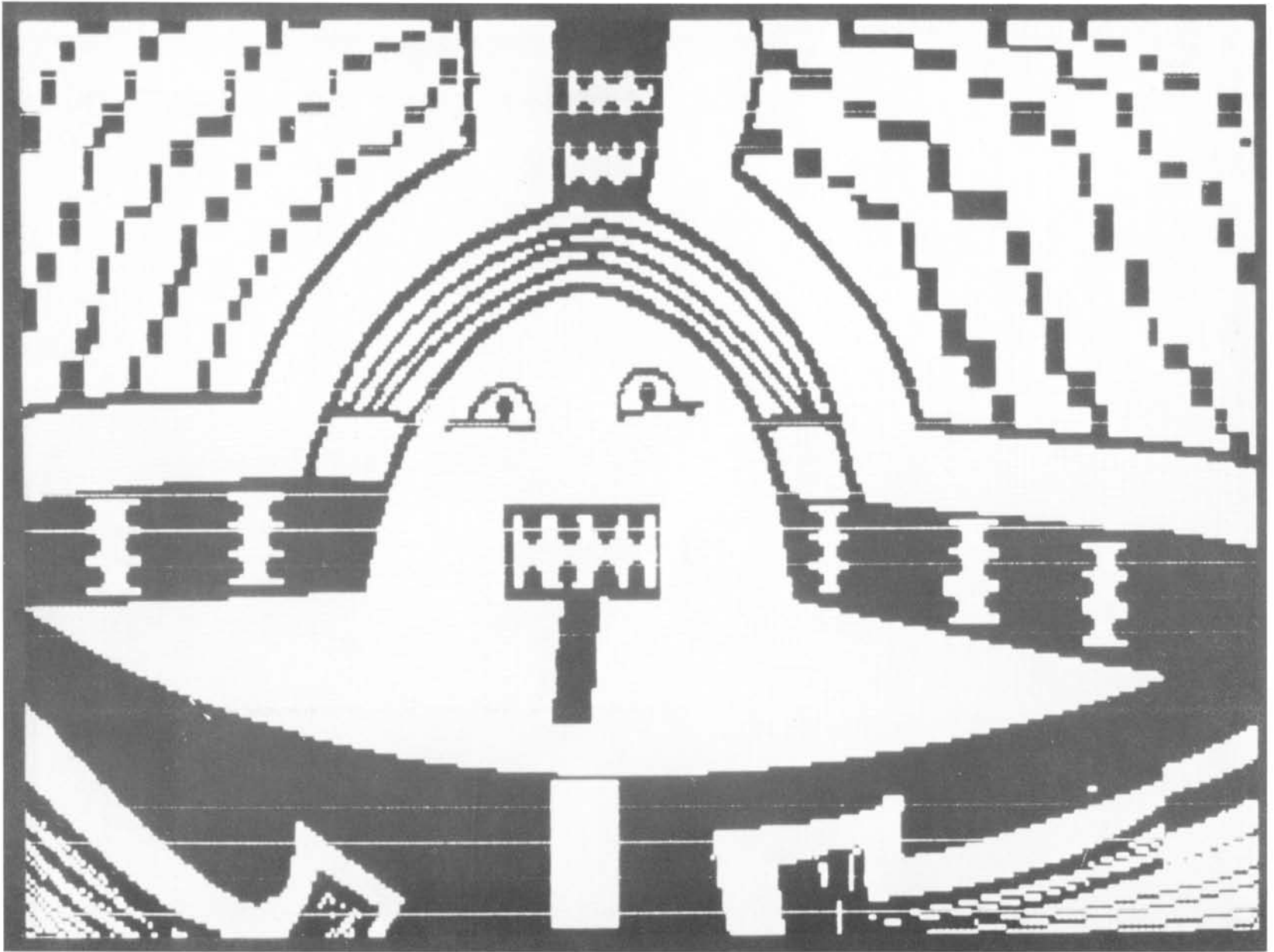
Elizabeth Rosenzweig  
**Yidwoman.** 1985



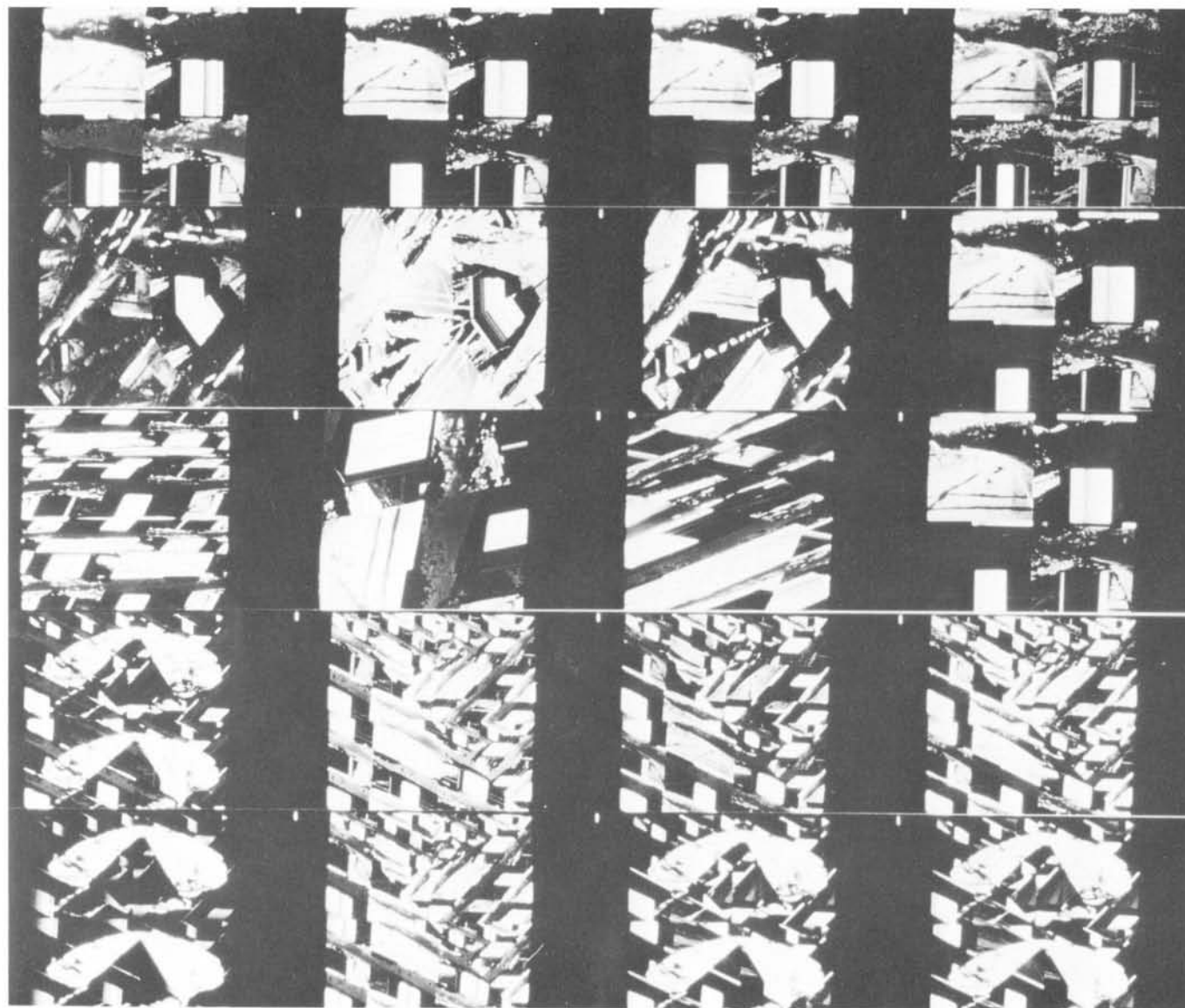
David Em  
**Lovit 2.** 1987



Tony Longson  
**After Mondrian.** 1986

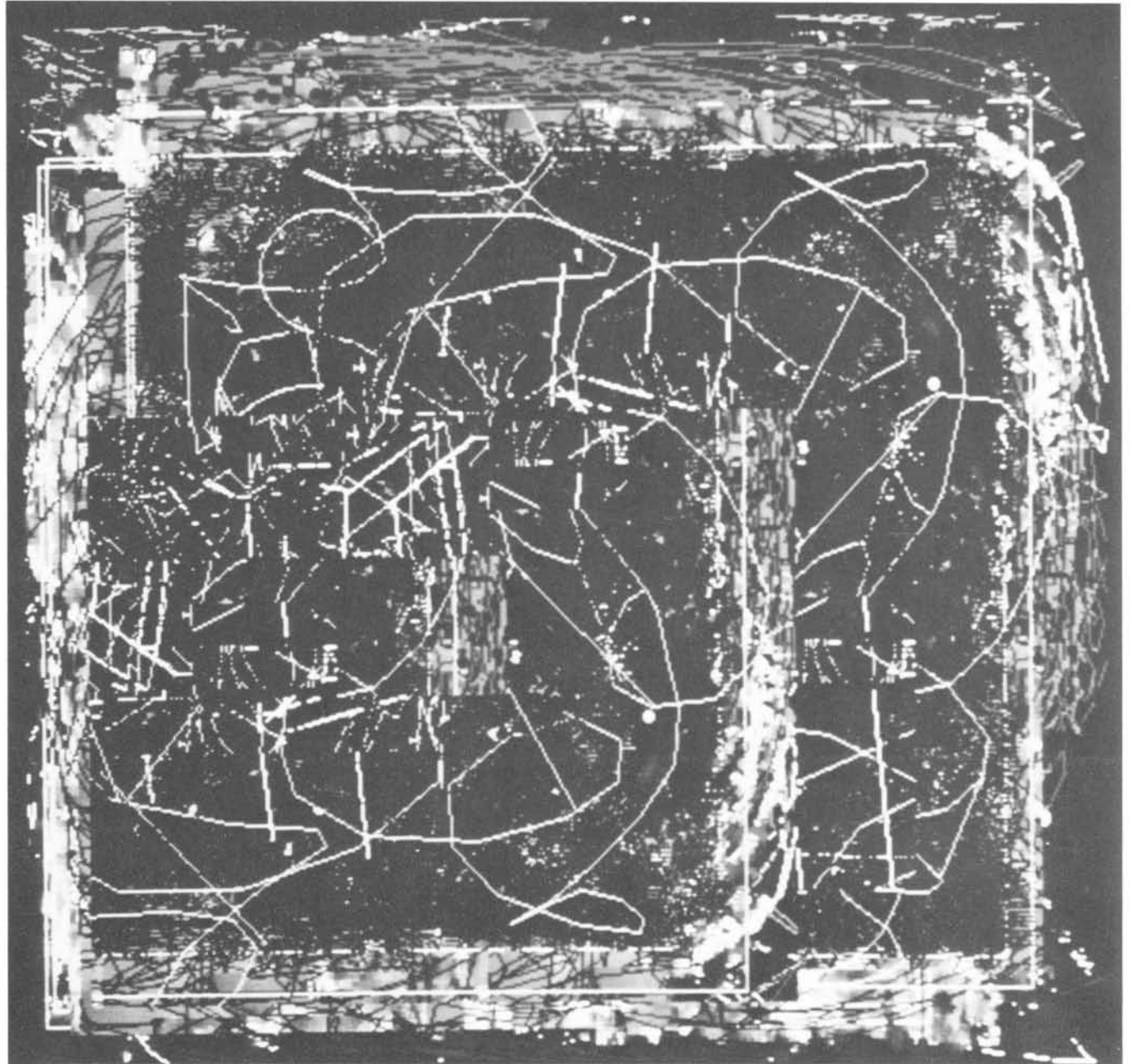


Eileen Zegar  
**Human Face.** 1986



Gerald Hushlak  
**Untitled.** n.d.

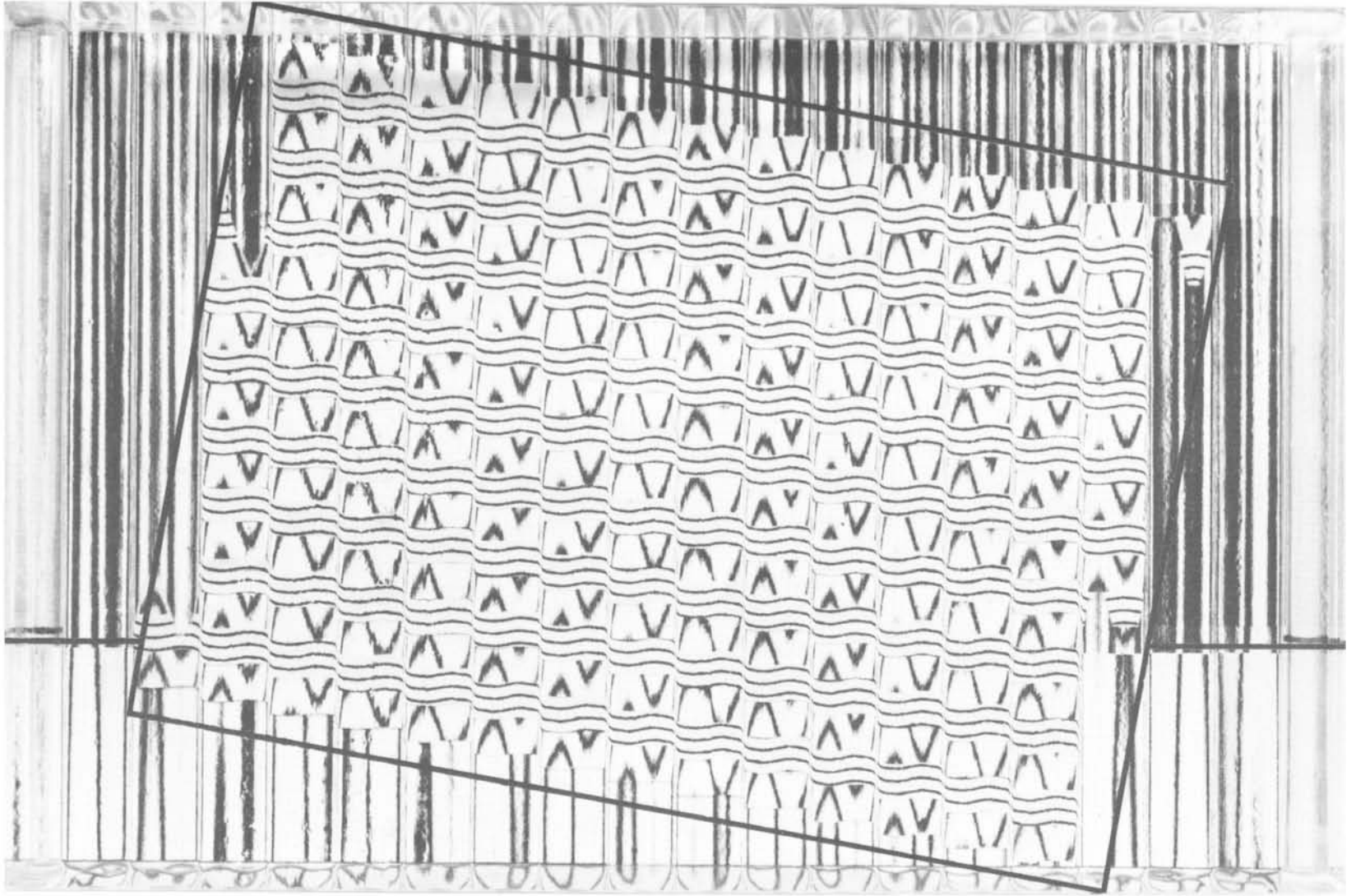




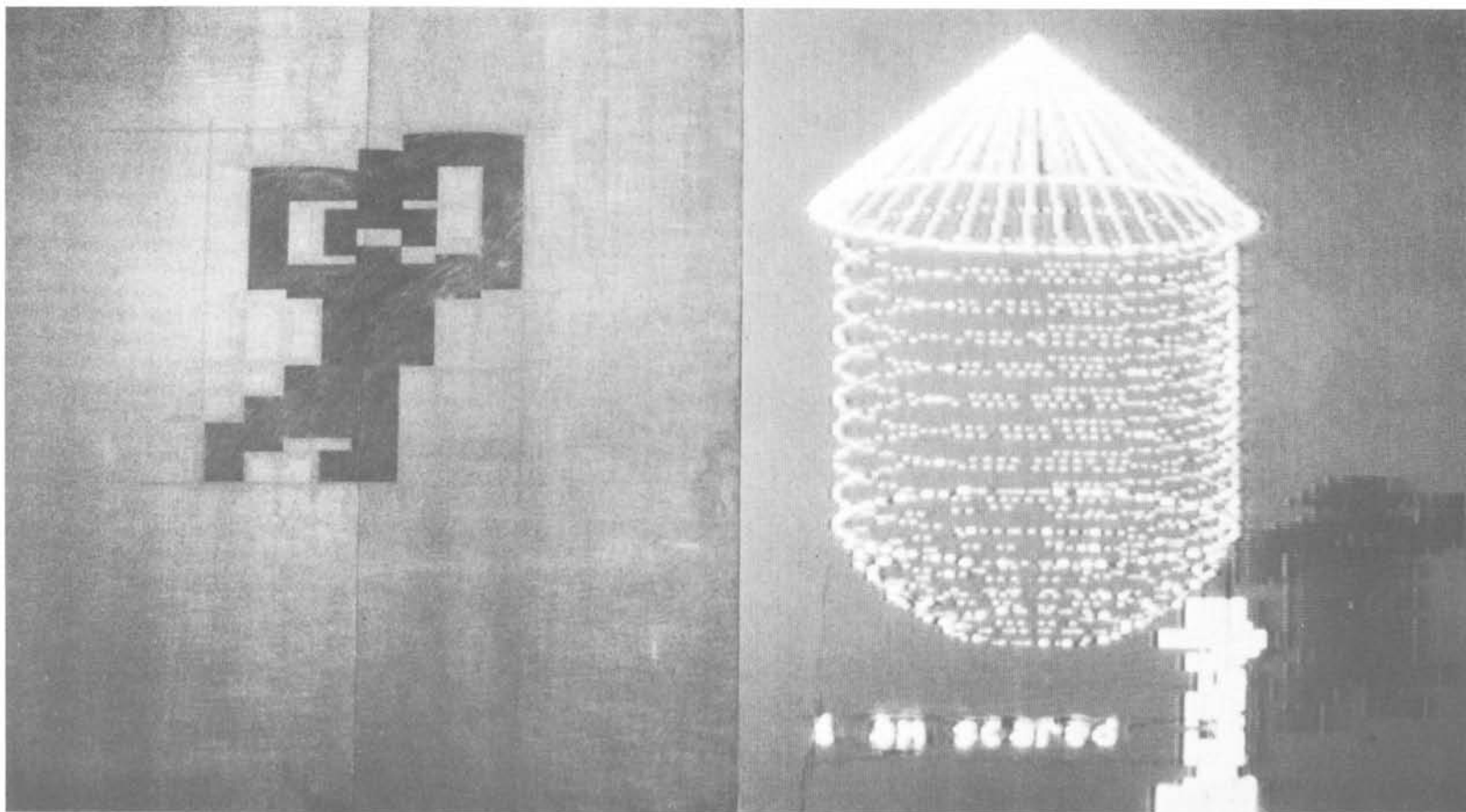
Christa Schubert  
**Untitled.** 1986



Lorna Pauly Jordan  
**Fair Play.** 1986



Sydney Cash  
**Tilted Rectangle #1.** 1986

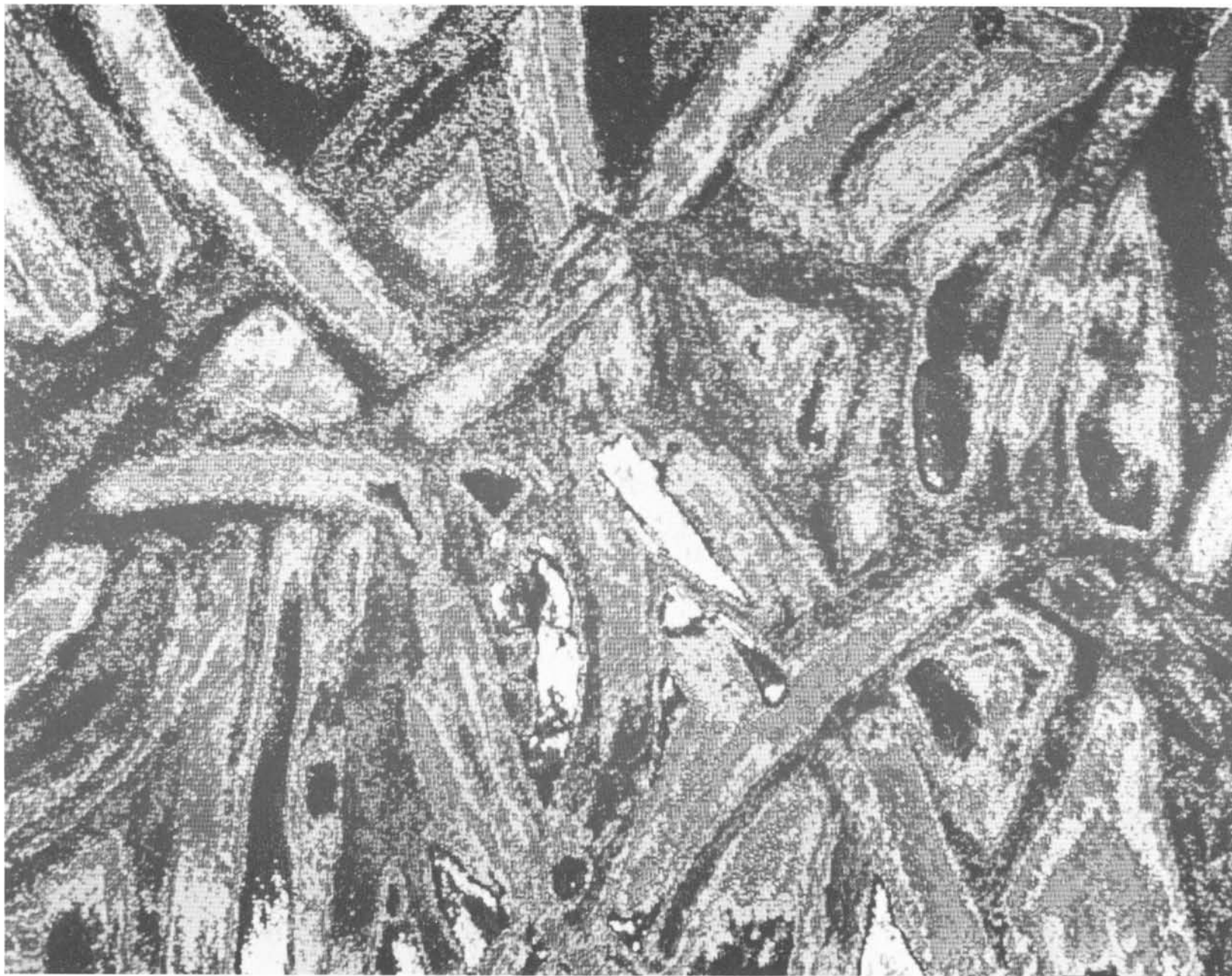


P. Michael Brakke  
**I Am Scared.** 1984

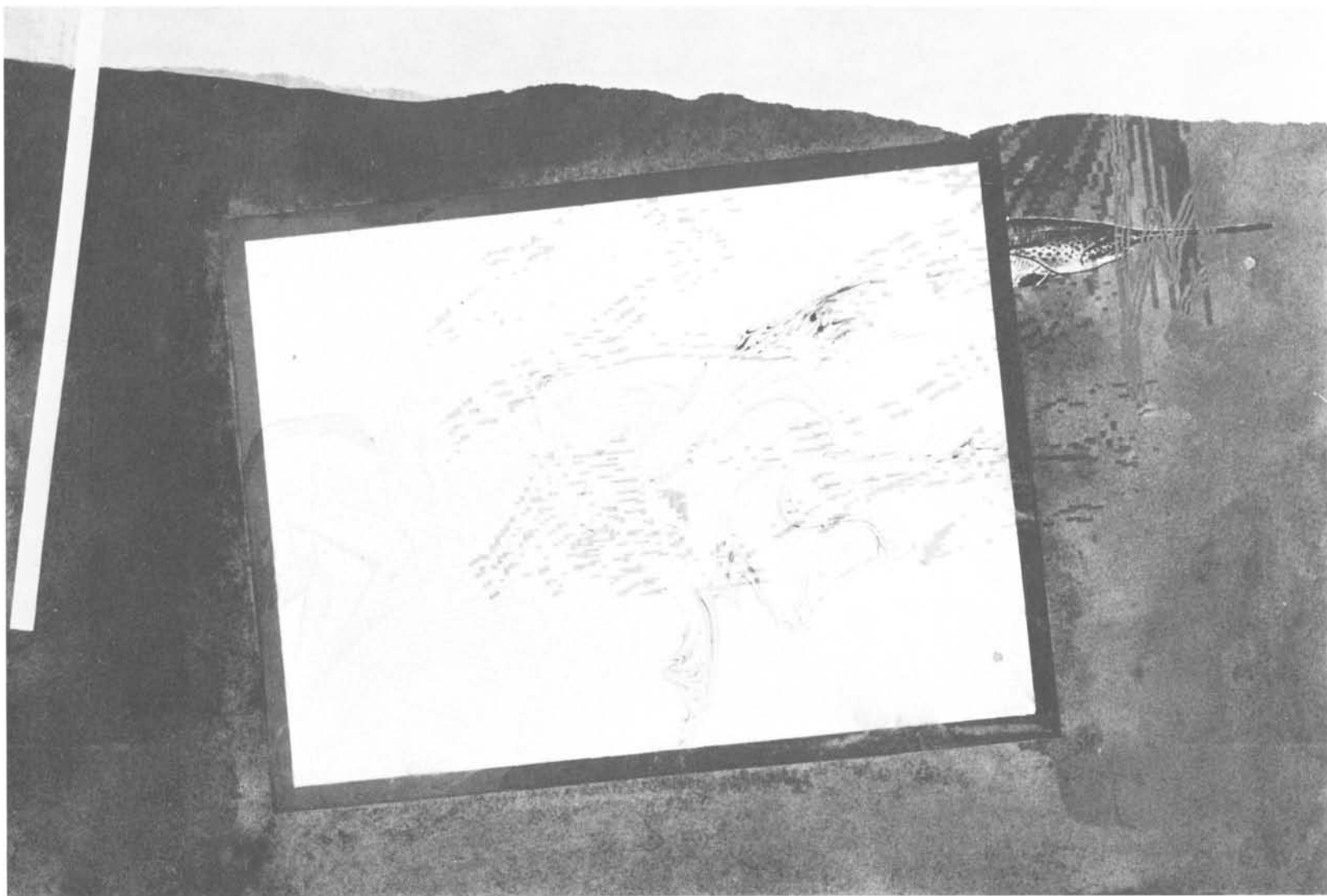


Ronald MacNeil  
**Untitled.** 1982

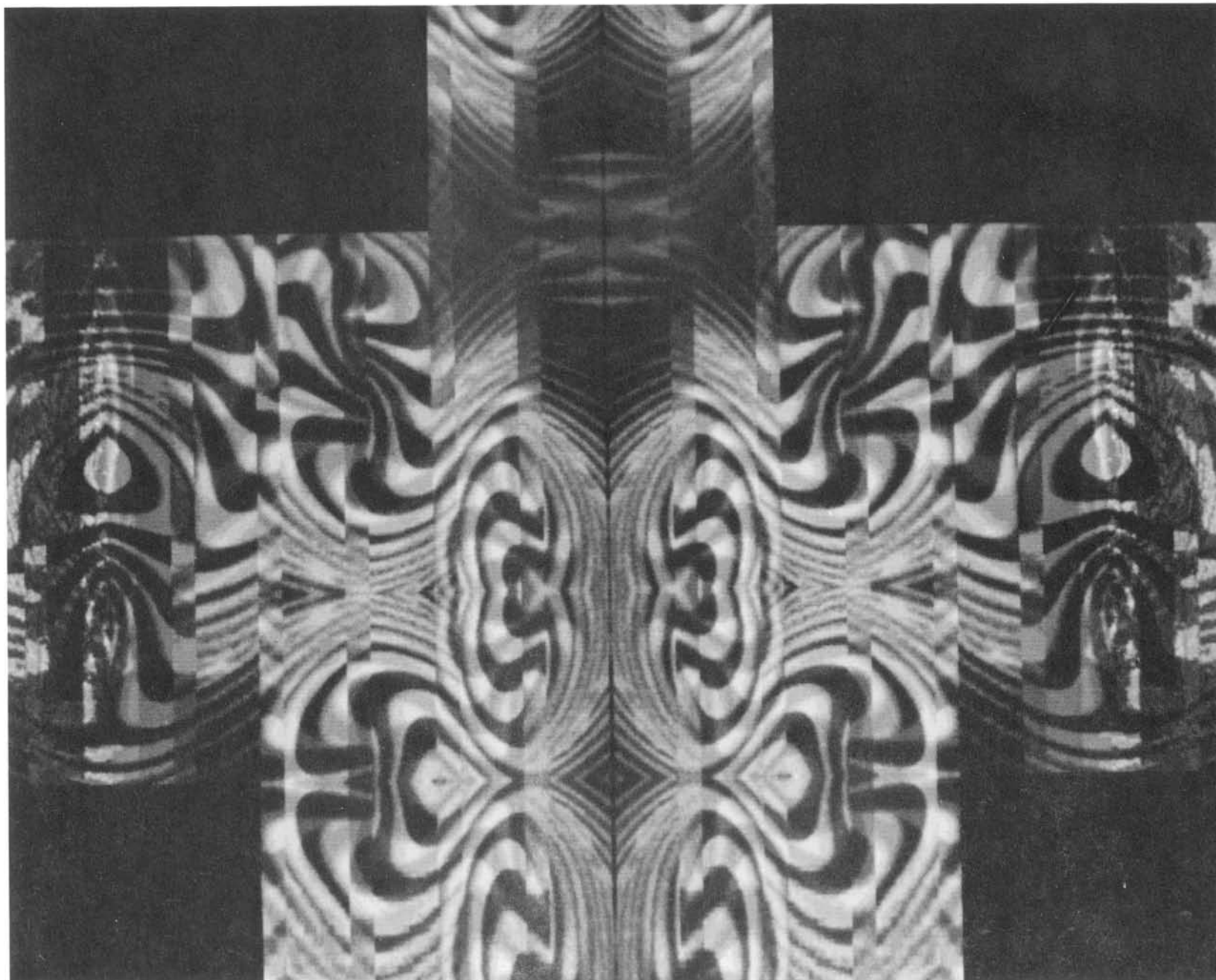




Rodney Disco-Doc Chang  
**Incisors.** 1987



Frances Valesco  
**Afternoon of a Fish #6.** 1986



Ilene Goss Schuster  
**Passages.** 1985



Tom Lesser  
Random Ransom. 1986

## Emerging Expressions in Video Computer Art

Computers and video are technological tools used to explore an increasingly technologically constructed environment. As a political tool, television is obviously a strong force in maintaining the values of capitalism, consumerism, and Judeo-Christian morality that govern our society. Fundamentally, TV is a steady glow of rapidly lit dots pulsed by two synchronous patterns forming a representation caused by the electromagnetic recording of activities, landscapes, and people. The image is not as important as what makes it move: corporate messages, hypnotic flow. Generally, computer/video technologies are expensive to own or rent and are reserved for commercial messages, statistics, and illustrations. Satellite and computer networks span the globe delivering the instantaneous audio-visual information needed to control the international cultural economy.

Computer/video sometimes can play on the intersection of art, commerce, and television in ways that relate to other forms of cultural and aesthetic communications. (The difference being no more important than the choice of sculpture rather than painting.) The concerns are transparent, often falling within overlapping identifiable genres and styles-- spiritualist/mystical, like Ed Emshwiller's **Skin Matrix S**, (1987); social/political, like Mark Gilliland's **Chernobyl West**, (1986), formal/structuralist, like Peer Bode's **Art of Memory**, (1985), narrative/performance, like Ann-Sargent

Wooster's **Carmen**, (1986); science fictional, like Matt Elson's **Maya: The Dream of Reality**, (1985); poetic, like the four short pieces by Hilja Keading; and painterly, like Stefan Roloff's **Big Fire**, (1986). Regardless of the genre or thematic intentions of the work, viewers can potentially have an "aesthetic" experience; they often become more aware of how computer graphics are integrated into conventional media (broadcast, magazines, etc.) and become more critical of its uses as a manipulative commercial device.

Computer/video-art practice and experimentation share transmission methods and occupy a fringe, but relatively safe, ideological position on the broad spectrum of television discourse. Some of the tapes in this exhibition, like Merrill Aldighieri and Joe Tripican's **Industry**, (1986) could easily be shown on broadcast television; others, like the Japanese artist Teckon's **Elephant and Naughty Dove** will likely remain unmassified. Several tapes are especially suitable for young people as examples of humanistic alternatives, particularly Ann-Sargent Wooster's **Trains or How I Almost Killed My Sister Katy**, (1985) Linda Gottfried's **Gyro-Glyphics**, (1985) Maureen Nappi's **Processional**, (1985) and Tanya Weinberger's **Z.**, (1986).

Disassociated from subtextual themes, many of the tapes in this exhibition can be seen as a continuation of work done by diverse





Matt Elson  
**Maya: The Dream of Reality.** 1985

artists attracted to computer-imaging since the mid-1950s.<sup>1</sup> This includes kinesthetic research,-- the study of energy patterns -- interwoven through signal processing, computer storage and retrieval, special-effects rejuxtaposition, and camera refractions. A good example of this can be found in Ralph Hocking's work which reflects a continuity of aesthetic traditions applied on an extremely personal level of production and dissemination.

These tapes generally tend to demystify media and often involve deconstruction of commercial models, a reverse of the "hypodermic needle effect" in which passive viewers are injected with values, ideas, and information without distance or self-mediation. Their repetition, multi-acculturality, and the other criteria described by Patric Prince in her essay demand dialogue, often struggle, for understanding, unlike the inert symbology asserted by and for the hegemonic powers controlling television.<sup>2</sup> Consider the effect of Amber Denker's **Nagasaki**, (1986) on an average viewer who is suddenly confronted by mournful images visualized through electrocybernetics. Certainly, subversively poetic tapes like **Nagasaki** are a threat to the status quo.

To work with video as an artist in contemporary society is to investigate how traditional aesthetic and philosophical questions of art and culture are changed by new

instrumentation, while proposing questions pertaining to the unique imaging potentials of electronic and cybernetic media. Perhaps not since Cézanne and Cubist experiments with formal aspects of painting has there been such a unique opportunity to seek redefinition of the parameters of visual imaging. The Cubists were process-oriented, exploring how forms interacted through time and space. Cézanne's statement, "Treat nature by the cylinder, by the sphere, the cone, everything in proper perspective," takes on new meaning when the palette is a mathematically based medium and the image is formed by shaping invisible energy waves or drawing diagrams with a light pen or keyboard. Seen in this perspective, Matthew Schlanger's polymorphic, pulsing colorfields contribute to the evolution of the aesthetics of abstract expressionism. Jane Veeder's **4KTape**, (1986) uses computer game-like geometries to dissect distinctive spatial dimensions offered by the raster.

Computer/video systems provide a flexible environment for exploration of how objects interact: the structure lends itself to multi-dimensional mixing that provides alternative perspectives and dimensions toward defining new relationships between structure and movement and between the viewer and audio-visual, real-time imaging events. The computer, at the very least, extends the potential of eyes and of optical systems. Most of the time the computer is used as memory, storage,

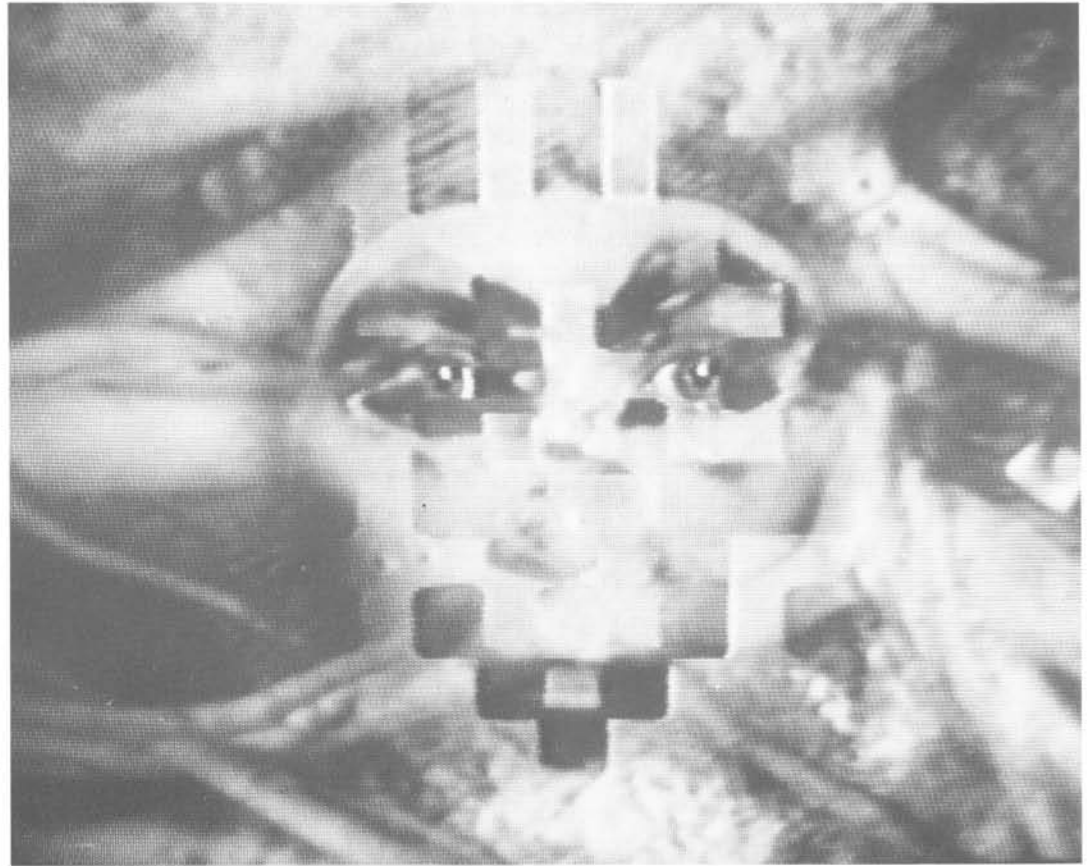
and interactive technology for processing and dissemination. The computer is also a means for experience: not only is the imaginary landscape or activity being explored, but the ways in which the computer extends ways of seeing as well.

As new systems become smaller and less expensive, they also become more integrated with the user. The Fairlight Computer, used in Neil Zusman's tapes, is a low-resolution, performance-oriented system that accepts two video sources and outputs a "gen-locked" TV signal. It can be used as a special-effects generator for various transitions and digital effects like frame storage, colorization, mapping, zooming, and more. Jim Gibson used the Amiga computer with Aegis and Electronic Arts software to create **Bodiless Whisper Again**, (1986). The Amiga has the potential of doing for computer art what the portapak did for video, offering accessibility and flexibility for a wide range of applications in the arts. Several tapes, including Sara Hornbacher's **Writing Degree Z**, (1985) were produced using Designlab systems (colorizers, frame buffers, raster manipulators, etc.) created by David Jones at the Experimental Television Center in Owego, New York. This is a unique art and research facility that provides long-term access to a wide range of analog and digital systems through a residency program. Edward Zajec's **Chromas**, (1987) uses a Scion Cs-6050 color-graphics microcomputer to rhythmically explore chromatic

structures in real time.

The growing variety of systems and their adaptability to individual styles and concerns are some of the most exciting aspects about working in this field. New York's Media Alliance-sponsored On-Line and Raindance's Matrix/Standby program have made expensive systems like the ADO, Mirage, and Quantel Paintboxes available at reduced rental. Artists also have increased access to the range of PCs that offer videographic interfaces.

The use of digital instruments to convey analog meaning poses a complex dilemma that is amplified by other disciplines, including psycholinguistics. In his book *Family Paradigms*, Larry Constantine writes that "in human communication, as in all information processing, information may be represented or encoded in either of two different basic schemes."<sup>3</sup> Analog is representational: the message is a symbolic representation or metaphor for what is being communicated. Encoding is accomplished through use of a medium that is continuously varying. Digital messages are composed of discrete packets or units that are associated arbitrarily with intended meaning. Constantine writes that "analogic communication has degenerate forms of syntax, it lacks the precision of digital communication . . . it can be extremely efficient, but also present more ambiguity."<sup>4</sup> It would be interesting to hear a psychovisual reading of Yvonne



Dignard's **Peccadillos**, (1986) by someone like Yvette Biro or John Ellis that stretched the structural elements of imaging toward consideration of narrative themes (voyeurism, narcissism, etc).

Ed Emshwiller  
**Skin Matrix S.** 1987

In both computer and video art, as well as in the hybrid synthesis, there is often the questioning of the meaning of meaning (relating to the meaning of vision and illusion.) A good example of this is the fractal landscapes of Mandelbrot and others that shake perceptions and



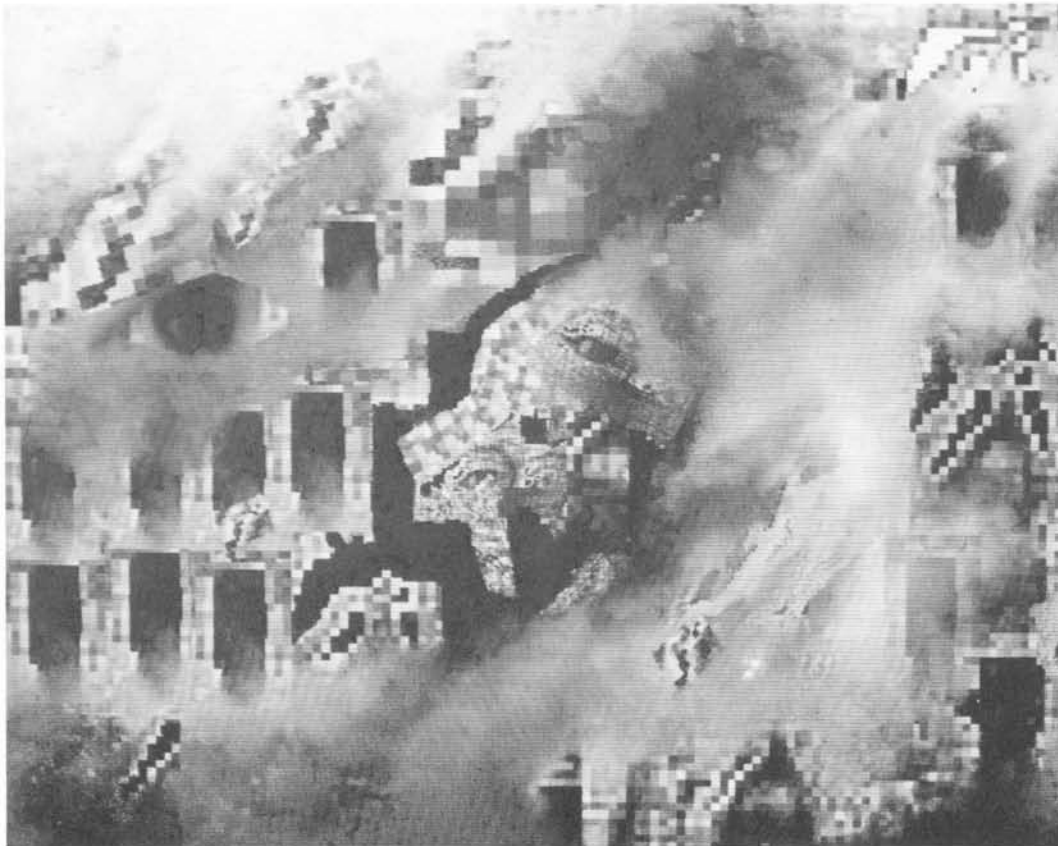
Amber Denker  
**Nagasaki.** 1986



lead to demystification of media. The use of analog systems, controlled and transformed through digital instruments, leads to private languages, paranguages, visual slang. An underlying issue is whether it is possible to express abstract ideas (absence, fear, understanding) in media that syntactically depend on analog-digital behavior.

Intentions are transformed by the parameters of computers and recording devices. Technological instruments dramatically reveal new visual dimensions while hiding the full

range of other sensual experiences. While the whole view is available to the eye, the microfeatures are less apparent. Don Ihde, in *A Phenomenology of Instrumentation*, calls this the "amplification reduction structure."<sup>5</sup> As there is increased enhancement, there is more distance from the object that is being experienced. Ihde believes that sometimes instrument transformation yields features that are genuinely new, allowing unique perspectives. Like the telescope, computer/video systems transform space as distance and make it near. In tapes like Naoko

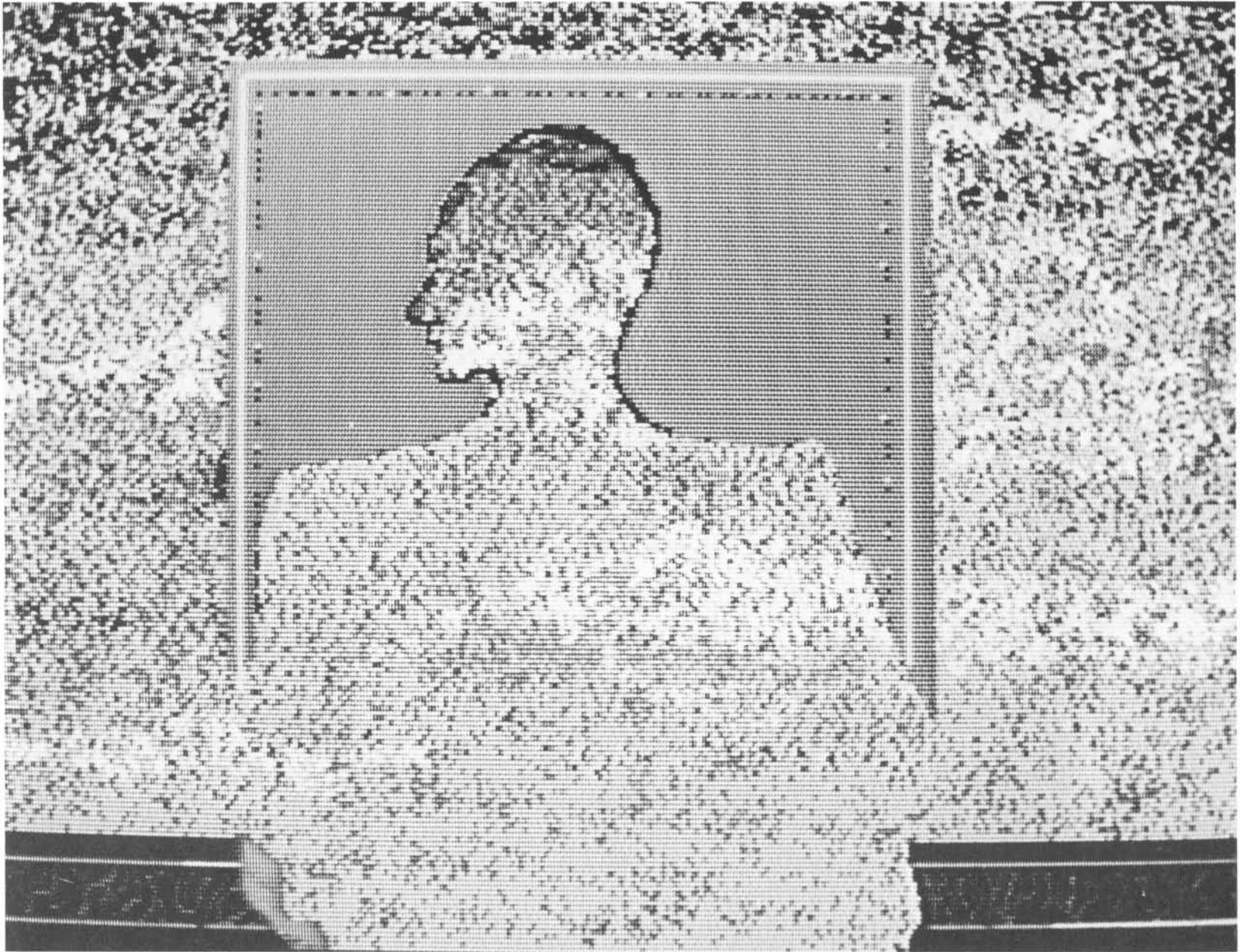


Tosa's **Trip**, (1985) and Anne Seidman's and Susan Amkraut's **The Blue Chair**, (1986) we witness the beginnings of the artificial but real environment that is becoming known as cyberspace. Woody and Steina Vasulka's **ECCE**, (1987) continues their study of New Mexico landscapes filtered through digital re-imaging tools.

A final thought: It's curious, at a time when the art world is abuzz with the latest catchwords-- simulation and complicity-- it continues to ignore the relevance of technological media in the dialogue about the nature of art. Is it simply coincidence that the influential philosopher Jean Baudrillard's name includes the computer term "baud"--referring to the speed that a modem can receive and send signals? (Probably.) It's no wonder artists working in traditional mediums react so strongly to his writings. His book *Simulations* poetically describes a theory of anti-theory-- the negation proving the truth of what it denies. Hence the title and intention of the recent Group Material show *Resistance(Anti-Baudrillard)* loops paradoxically.

In fact, the most exciting work in computer video is being done with simulation research techniques.

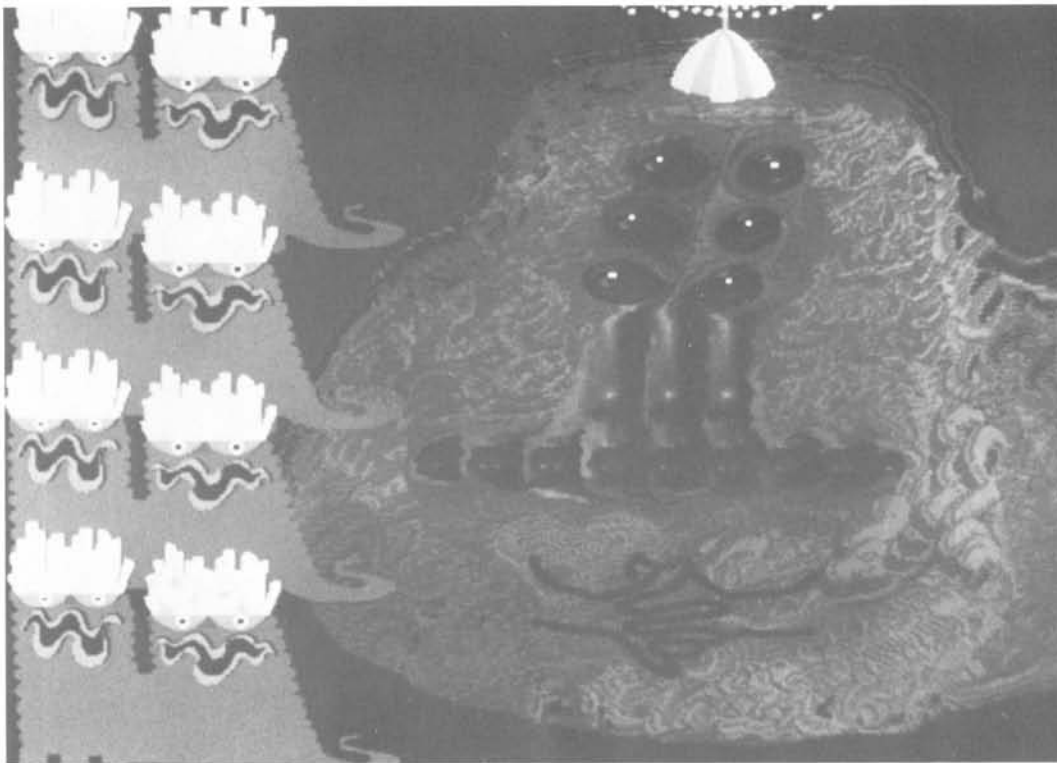




James D. Gibson  
**Bodiless Whisper Again.** n.d.



Susan Amkraut and Anne Seidman  
**The Blue Chair.** 1986



Deborah Weisblum  
**Interactive Escher.** 1987

(of the self, the player) is suddenly attacked and winds up in a hospital in a strange city. Meanwhile, another player has raided his business. (Simulation is the terrain of ambiguity.) There is a vicarious thrill, transference to the figure (digital hieroglyph) that stands for the whole. The flight simulation games esteemed by militaristic leaders are effective training for "star wars" technology and missile guidance systems. By abstracting the real (digital recomposition of analog information), the purpose becomes more a function of remote control. While the target appears to be nonphysical, it does not mean that it is also immaterial.

Shalom Gorewitz

Commercially, there is a race to come up with a formula for hyperrealistic animation that can be substituted for live actors. Matt Elson's interest in masks, Ed Emswiller's in flesh and anatomy, and the general concerns of animators like Linda Gottfried, Tanya Weinberger, and Maria Manhattan, point to this endeavor. The use of computer-processing to erase Reagan's wrinkles in his election commercials is relatively innocuous compared to the possibility of a simulated Reagan stand-in.

William Gibson's science-fiction novels *Necromancer* and *Count Zero* depict a futuristic society in which things that happen inside the

computer are as real as anything else. The protagonist is literally wired into a complex network of simulated experiences and mathematical projections. Is this what computer players are moving toward? Interactive games lead to introspection and require absorption of invented languages. Rules are complex, ambiguous, and iconic, causing macroscopic thought-patterns and focus on details. The player moves with varying degrees of control and randomness.

Some games are currently being played on national networks-- the participant joins and gets a "house" with a key. The iconic representation

## Notes

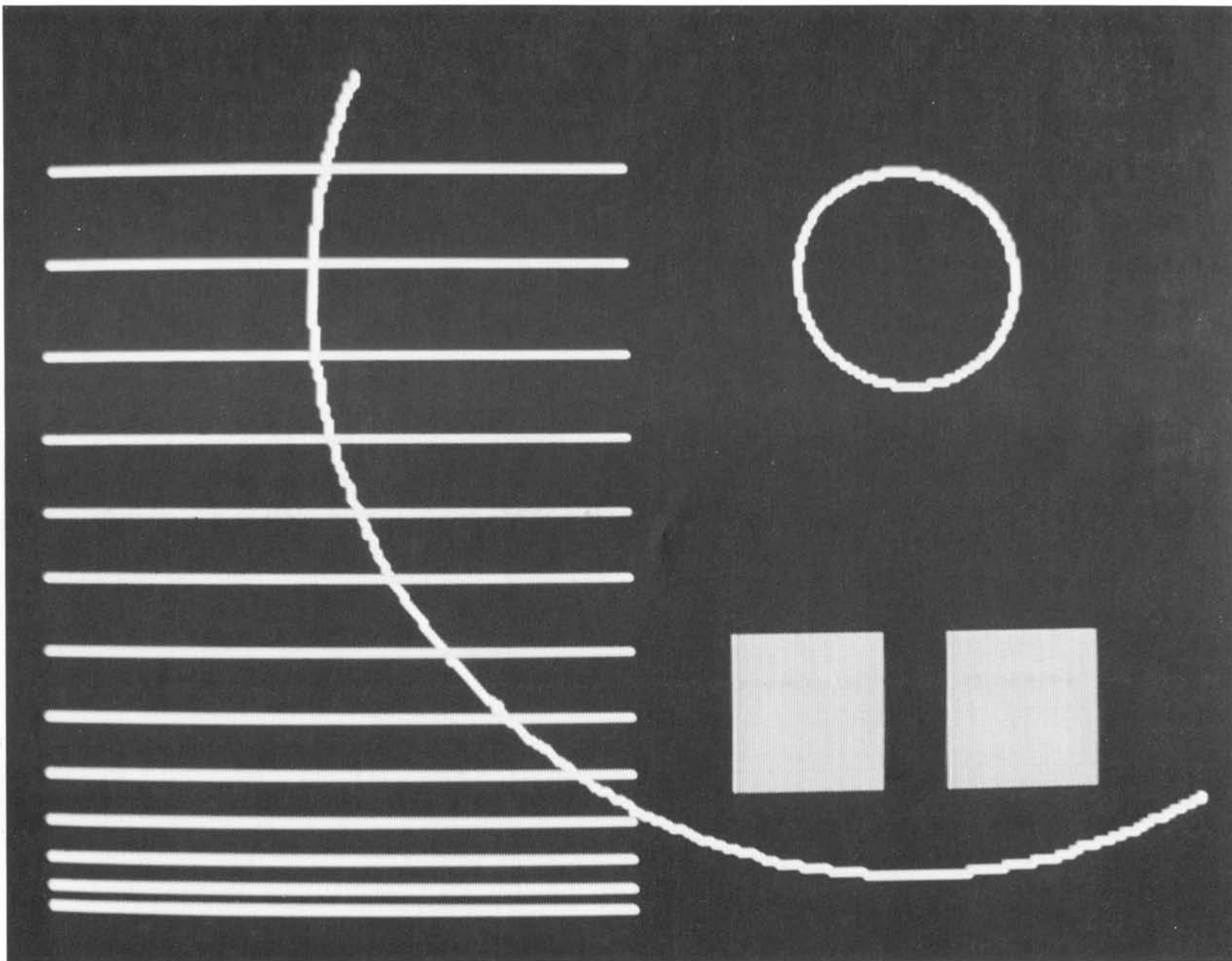
<sup>1</sup> See Jack Burnham, "Art and Technology: The Panacea That Failed," *Video Culture: A Critical Investigation*, John Hanhardt, ed., (Visual Studies Workshop, Rochester, NY, 1986).

<sup>2</sup> *Hegemony* is a concept used in cultural studies to refer principally to the ability in certain historical periods of the dominant classes to exercise social and cultural leadership, and by these means-- rather than by direct coercion-- to maintain their power and cultural leadership.

<sup>3</sup> Larry Constantine, *Family Paradigms*, (Gilford Press, New York, 1986), p.81.

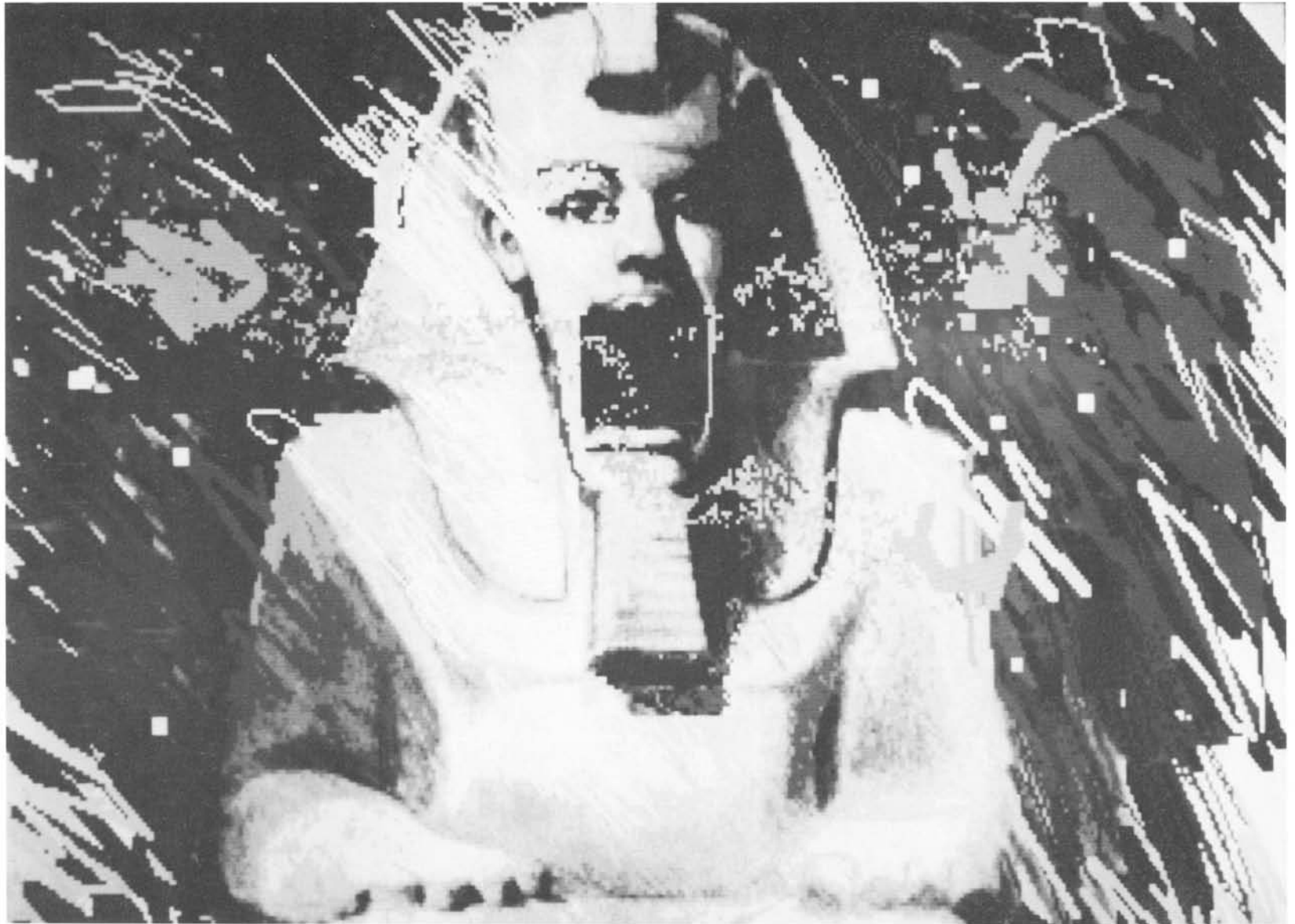
<sup>4</sup> *Ibid.*...

<sup>5</sup> Don Ihde, "The Phenomenology of Instrumentation," *Technics and Praxis*, (D. Reidel Publishing, Dordrecht, FRG, 1979).



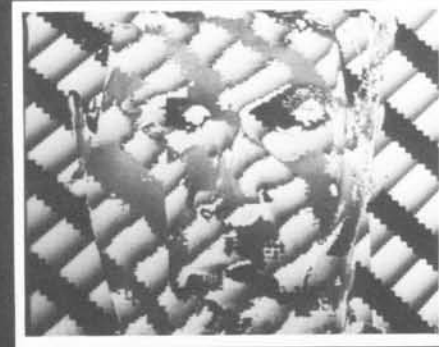
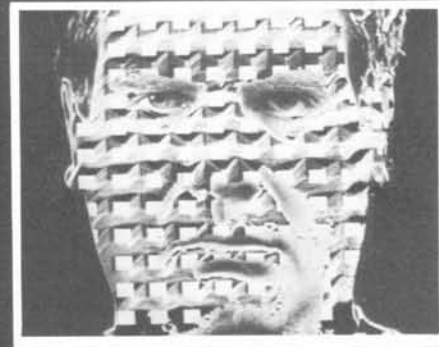
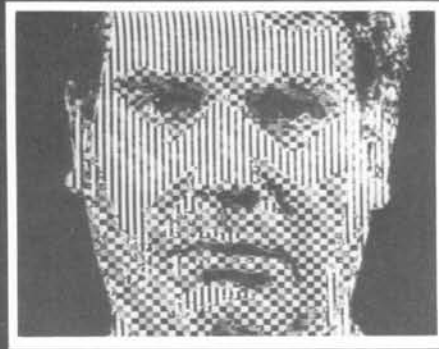
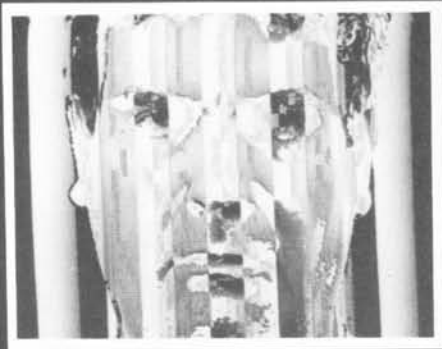
Jane Veeder  
4KTape. 1986





Linda Gottfried  
**Gyro-Glyphics.** 1985





Woody and Steina Vasulka  
ECCE. 1987

# Checklist

## Visual Art

Mel Alexenberg  
**Digitized Homage to Rembrandt:  
 Jacob's Dream.** 1986  
 Etching and aquatint on paper  
 30 x 22"  
 Collection of the artist

*Images generated with a Cubicomp/Lumina IBM PC and a Data-Cube frame grabber with video camera. Negatives enlarged on Kodalith film for etching.*

Carlos Arguello  
**Androgyny, Androgyny Audience,  
 Crucifixion and The Flat.** 1986  
 Cibachrome  
 32 x 40" (four sections, 16 x 20" each)

*Images rendered on Synthetic Video EX-2 hardware using Synthetic Video Choreography software.*

(Art)<sup>n</sup> Laboratory  
 (Donna Cox, Tom De Fanti, George Francis, Ray Idaszak, Daniel John Sandin, Ellen Sandor)  
**Apollo.** 1987  
 Phscologram  
 13 3/4 x 10 1/2"  
 Courtesy Feature, Chicago, with special thanks to Larry Smarr and The National Center for Supercomputing Applications

*A phscologram is a high tech art form that combines photography, holography, sculpture, computer graphics and video. Three-dimensional transparencies of real-time objects, phscolograms simulate sculptures, video portraits and nudes. **Apollo** is a three-dimensional display from computer-generated deformations of the Romboy Homotopy, a mathematical equation in four dimensions.*

Colette and Charles Bangert  
**Katie Series: Field Greyed.** 1986  
 Plot drawing on paper  
 8 1/2 x 11"  
 Collection of the artists

**Katie Series: Field Greyed Green.** 1986  
 Plot drawing on paper  
 8 1/2 x 11"  
 Collection of the artists

*Images created using an IBM PC with software written by the artists in Turbo Pascal and printed with a Hewlett-Packard 7475A plotter with colored inks.*

Terry Blum  
**Square One #3.** 1986  
 Cibachrome  
 17 x 22"  
 Collection of the artist

**Square One #16.** 1986  
 Cibachrome  
 17 x 22"  
 Collection of the artist

*The images were produced on an IBM PC with a Number Nine frame buffer, software from Time Arts and custom software from the Fashion Institute of Technology.*

P. Michael Brakke  
**I Am Scared.** 1984  
 Oil on Hypalon  
 96 3/4 x 173"  
 Courtesy Marianne Deson Gallery, Chicago

*The painting is composed of a ScanMural, a computer-controlled spray-paint process which produces an image from a transparency. Hypalon, a vinylized fabric was used as was paintstick.*

Edgar Buonagurio  
**Corona.** 1986  
 Acrylic on plywood  
 48 x 48"  
 Courtesy Siegeltuch & Company,  
 New York

*The painting was designed and drafted on a Macintosh Plus computer with Superpaint and other software, then hand painted.*

Sydney Cash  
**Ivan Said Ba-Na-Na Today 12106.**  
 1986  
 Glass, computer drawing, paint and steel  
 9 x 12 x 4 1/2"  
 Collection of Anne and Ronald Abramson,  
 Washington, DC

**Tilted Rectangle #1.** 1986  
 Glass, computer drawing, paint and steel  
 14 x 19 x 4 1/2"  
 Collection of the artist

*The drawings which are a part of these works were created on a 1409 terminal with a modem to a Tektronix computer with a 4696 color graphics printer.*

Rodney Disco-Doc Chang  
**Incisors.** 1987  
 Cibachrome  
 16 x 20"  
 Collection of the artist

*This image was created with a Commodore Amiga and Electronic Arts software and processed into a cibachrome print.*

Donna J. Cox  
**Windows I.** 1986  
 Cibachrome  
 86 x 56"  
 Collection of the artist

*The images were created on a Stanford Technology Display using a PDP/11/45 mainframe and software designed by the artist.*

Robert E. Dewar  
**Diamond Seed.** 1986  
 (maquette)  
 Polymer and acrylic on cardboard  
 36 x 26 x 56"  
 Collection of the artist

*The sculpture was designed using IBM Mainframe with CAD/CAM software to make two and three dimensional drawings and custom designed software to further manipulate the drawings which were then plotted on a Versetec 9242 Electrostatic Color Plotter and mounted on cardboard.*

David Em  
**Lovit 2.** 1987  
 Acrylic on canvas  
 48 x 66"  
 Collection of the artist

*The painting was designed using a DEC VAX /780 with Gould di Anza frame buffer and software written by Dr. James F. Blinn.*

Eudice Feder  
**Aravah Lights.** 1986  
 Plot drawing on paper  
 10 x 22"  
 Collection of the artist

**Arctic Flame.** 1986  
 Plot drawing on paper  
 9 x 10"  
 Collection of the artist

*The plot drawings were done on a CDC CYBER 170 using Simplot software and plotted with a CalComp 4-pen plotter.*

Jürgen Lit Fischer  
**See Piece.** 1987  
 Acrylic on canvas  
 72 x 36"  
 Collection of the artist

*Fischer creates screen prints, constructions, and paintings with a Prime 9950/55/11 computer and prints drawings on a Benson 122 plotter. He then uses the developed images or the plotter drawings for separation for screen prints. An Aristomat 8320 was also used. He writes in FORTRAN, a programming language.*

Rob Fisher, with Raymon Masters  
**Musical Instrument, Skyharp Series.** 1986  
 Painted steel and aluminum plates,  
 stainless steel cables and rods  
 144 x 180 x 84"  
 Collection of the artists

*The sculpture was designed on an Evans and Sutherland Multi-Picture System connected to a DEC PDP 11/34 minicomputer host and Pennsylvania State University's IBM 3090 with software by Raymon Masters.*

Jeremy Gardiner  
**Jester.** 1986  
 Acrylic on canvas  
 72 X 60"  
 Collection of the artist

*The painting was designed with the aid of a computer as a "sketchbook" and as a manipulator of photographic images and color variations.*

Laurence M. Gartel  
**Spiderwoman's Domain.** 1987  
 Computer printout on paper  
 40 x 50"  
 Collection of the artist

**Catacomb for a Princess.** 1986  
 Computer printout on paper  
 40 x 50"  
 Collection of the artist

*Printouts produced on an Apple Macintosh with the following software; FullPaint, Mac 3D, Diatom, Thunderscane and Thunderware.*

Rachel Gellman

**A Woman of Stature.** 1986  
Photographs and acrylic on wood  
43 x 34 x 14"  
Collection of the artist

*The sculpture is composed of computer images from an IBM PC and Time Arts Easel paint software with a Scion frame buffer mounted on a wood frame.*

Karen Guzak

**Ibis 14.** 1986  
Computer drawing and ink jet print on paper  
5 x 6 3/4"  
Courtesy Davidson Galleries, Seattle

**Ibis 18.** 1986  
Computer drawing and ink jet print on paper  
5 x 6 3/4"  
Courtesy Davidson Galleries, Seattle

*The prints were composed on a Florida Computer Graphics system with IBIS software and printed on a Tektronix 4-color ink-jet printer.*

Carter Hodgkin

**A.I. #1.** 1986  
Oil, casein and silkscreen on board  
18 x 54"  
Courtesy Stux Gallery, New York

**A.I. #9.** 1986  
Oil, casein and silkscreen on board  
18 x 56"  
Courtesy NYNEX Corporation

*The paintings are composed of handpainted reproductions of image-processed data and photo-silkscreened enlargements of actual integrated circuits of computer chips.*

Gerald Hushlak

**Untitled.** n.d.  
Photograph  
24 x 20"  
Collection of the artist

*Work was produced on an IBAS Komtron Medical Imaging System and plotted on a Versetec plotter.*

Lorna Pauly Jordan

**Fair Play.** 1986  
Cibachrome  
16 x 20"  
Collection of the artist

*The image was created with a Florida Computer Graphics Beacon Illustrator system with IBIS software.*

Isaac Victor Kerlow  
**The Big Spiral.** 1985-86  
Acrylic on canvas  
66 x 52"  
Collection of the artist

**Landscape with an Ornament of Mountains.** 1985-86  
Acrylic on canvas  
40 x 60"  
Collection of the artist

*The central elements in both paintings are based on computer generated three-dimensional models. Both elements were modeled with the technique of cross-section reconstruction and rendered with random textures. The computer image was then photographed and the resulting slide projected on the canvas where it was traced and reworked with acrylic paint. The computer used was a DEC VAX 11/780 with Cartos software.*

Ruth Leavitt  
**Sculptural Relief II.** 1986  
Painted wood  
30 x 30 x 26"  
Collection of the artist

*The sculpture was designed on an Apple IIE using The Complete Graphics System Part II #3. Dimensional Graphics software from Penguin Software was also used.*

Tom Lesser

**Random Ransom.** 1986  
Cibachrome  
20 x 24"  
Collection the artist

*The photographs were created on a Quantel Paintbox using DPB V4 software and were printed as Cibachromes.*

Tony Longson

**Square Tonal Drawing.** 1985  
Silkscreen on plexiglass  
24 x 24 x 6"  
Collection of the artist

**After Mondrian.** 1986  
Silkscreen on plexiglass  
30 x 30 x 6"  
Collection of the artist

*These screen-printed images were produced on a LaserWriter from PostScript programs.*

Margot Lovejoy

**Azimuth XX -- The Logic Stage.** 1987  
Slide projection installation  
144 x 144 x 120"  
Collection of the artist

*Selected fine art and computer images are projected and are controlled by computerized dissolve units.*

Ronald MacNeil  
**Untitled.** 1982  
 Cibachrome  
 16 x 20"  
 Courtesy Visible Language Workshop,  
 Media Laboratory, Massachusetts Institute  
 of Technology, Cambridge, MA

*The image was created using SYS, a prototype  
 designer system using a Perkin-Elmer 3220  
 CPU and Grinnell 24-bit frame buffer. Software  
 in PL1 by The Visible Language Workshop,  
 Massachusetts Institute of Technology.*

Robert Mallary  
**Suburbia.** 1986  
 Cibachrome  
 8 x 10"  
 Collection of the artist

*The photograph was made with an IBM PC/AT  
 and West End Film software on an Atari 1040  
 ST system with Degas and N-Vision software.  
 Printed as a Cibachrome.*

John Manning  
**What's New?.** 1987  
 Interactive computer installation  
 Macintosh Plus computer and printer  
 14 x 10 x 11"  
 Collection of the artist

*Installation composed of direct interaction with  
 a Macintosh Plus computer and preset program  
 to produce newspaper-like articles.*

Robert Martin  
**Tinat #4.** 1985  
 Cibachrome  
 16 x 20"  
 Collection of the artist

*The image was created with an AVL Starburst  
 computer and AVL software.*

Steven L. Mayes  
**Spotted Harlequin.** 1986  
 Photo etching and screen print on paper  
 30 x 22"  
 Collection of the artist

*The image was designed on a Tektronix 4027-A  
 graphics terminal. The resulting patterns were  
 photographed and transferred to zinc plates  
 and stencils for printing.*

Glenn McQueen  
**Monet's Breakfast.** 1987  
 Cibachrome  
 16 x 20"  
 Collection of the artist, Courtesy of The  
 New York Institute of Technology

*The image was rendered on a VAX 11 /785  
 computer, using an Ikonas frame buffer with  
 New York Institute of Technology software.*

Steve Miller  
**Erased Permanently in an  
 Instant.** 1986  
 Oil on canvas  
 66 x 97"  
 Courtesy Josh Baer Gallery, New York

*The images were produced on an ADO at Peter  
 Caesar Video Graphics. A Rorschach blot was  
 digitized on the ADO and silkscreened onto the  
 painting.*

Manfred Mohr  
**P-397/A.** 1986  
 Wood and cardboard  
 100 x 100"  
 Collection of the artist

*The equipment used includes a PDP 11-23  
 computer and an Alfa Merics plotter, printing  
 onto full -size paper which was then cut out of  
 cardboard.*

Barbara Nessim  
**E198.** 1985  
 Cibachrome  
 24 x 30"  
 Collection of the artist

*Structurally, the image is divided into two  
 categories. The free-hand drawing mode was  
 employed for the figures and the geometric  
 modes for the spiralling rectangle, the two  
 polygons at each end, as well as for the  
 rectangular background of color which serves  
 as the electronic canvas. The integration of  
 precise, abstract mathematical forms with  
 figurative free-hand drawing is one of the  
 elements of this electronic painting.*

J. Michael O'Rourke  
**Images of Ourselves - Diana.** 1986  
 (maquette)  
 Painted aluminum  
 19 x 15 x 10"  
 Collection of the artist

**Study for Diana - rot z.** 1986  
 Plot drawing with charcoal on paper  
 22 x 30"  
 Collection of the artist

**Digital Model for Images of  
 Ourselves - Diana.** 1986  
 Photograph  
 8 x 10"  
 Collection of the artist,  
 Courtesy of The New York  
 Institute of Technology

**Digital Simulation of Intended  
 Scale of Images of Ourselves -  
 Diana .** 1986  
 Photograph  
 8 x 10"  
 Collection of the artist,  
 Courtesy of The New York  
 Institute of Technology



The digital model for the sculpture was designed with New York Institute of Technology CAD/CAM software which was later plotted onto paper on a Hewlett Packard 7580A plotter and transferred to aluminum sheets for manufacture. The drawing began as a hidden line drawing from the digital model, which was plotted and then enhanced with charcoals, chalks and crayons. The photographs are of those digital models.

John Pearson

**Remembrance #3.** 1986

Acrylic on canvas over shaped wood  
77 x 72 x 5"

Collection of the artist

The images for the work were first generated on a Tektronix 4013 terminal and plotted on a CAL-COMP Graphics Drum Plotter #563 - - each plot containing 256 unique linear images for a total of 11,800 images. The host computer for the CAL-COMP plotter was a Xerox SIGMA 9. The software was written in 'C' by Mike Ashley and allows for the generation of all possible permutations of a set of simple geometric shapes.

Elizabeth Rosenzweig

**Yidwoman.** 1985

Cibachrome  
16 x 20"

Collection of the artist

The images were produced on a Perkin-Elmer 3220 and a Grinnel GMR-270 frame buffer with Magic Six software from the Massachusetts Institute of Technology. Additional software was also used.

Christa Schubert

**Untitled.** 1986

Cibachrome  
16 x 20"

Courtesy Christa Schubert and Roy Montibon

The work is a collage resulting from a series of plotter drawings. The drawings were created

with a high-resolution plotter and software written by Ernest Schubert. In collaboration with Roy Montibon the work was re-processed through a Via Video paint system.

Ilene Goss Schuster

**Passages.** 1985

Cibachrome  
20 x 22"

Collection of the artist

The images were created on a Raster Technologies Z8000 computer at the University of Michigan with custom designed software.

Patricia Search

**Rhapsody in Time.** 1986

Cibachrome  
16 x 20"

Collection of the artist

The images were created using three-dimensional mathematical forms called "superquadrics" and modeled with a ray-tracing algorithm which tracks paths of reflected light rays. Hardware used includes a Data General MV 1000 and an Evans and Sutherland PS300.

Mimi Smith

**Error Messages.** 1986-87

Acrylic and pencil on canvas  
9 x 12" each (15 total)

Collection of the artist

These paintings are based on computer images and language as a creative source. This series utilizes error messages from a variety of computers.

Frances Valesco

**Afternoon of a Fish #6.** 1986

Silkscreen and ink on paper  
15 x 22 1/4"

Collection of the artist

The image was created in part with a Macintosh Plus computer with MacDraw software and transferred into a silkscreen print which is

further manipulated with inks and collage elements.

Debora Weisblum

**Interactive Escher.** 1987

Interactive computer installation  
AT&T 6300 computer with graphics board  
Collection of the artist, equipment  
courtesy of AT&T

This interactive work uses artist-designed software to produce visual patterns in a variety of forms and repetitions.

Mark Wilson

**NAC L17.** 1986

Acrylic on canvas  
44 x 84"

Collection of the artist

The images were developed using algorithmic procedures on the Color Graphics adapter of an IBM PC with custom software. The painting was then created using the IBM PC and an Alphaplot plotter to draw/print directly onto the canvas.

Norman Zammitt

**Caly-Forny-Ay.** 1987

Acrylic on canvas  
72 x 120"

Collection of the artist

The painting was designed using an Atari 800 and custom software to create lines and curves whose mathematical calculations determine the exact relationships of individual colors that collectively achieve a blend.

Eileen Zegar

**Human Face.** 1986

Computer printout on paper  
4 1/2 x 6"

Collection of the artist

This drawing was created on a Commodore Amiga computer with Deluxe Paint software developed by Electronic Arts and printed on an Okimate 20 thermal transfer printer.

**Audio Art**

Steven David Beck  
**Entre Nous I.** 1987  
 Interactive audio installation  
 Macintosh Plus computer, MIDI interface,  
 Yamaha synthesizers and speakers  
 Collection of the artist

*This work is a direct interaction with a Macintosh Plus computer and produces changes in musical parameters; rhythm, pitch, timbre and dynamic.*

**Video Art**

Merrill Aldighieri and Joe Tripican  
**Industry.** 1986  
 3:15  
 Video  
 Collection of the artists

**Meditation Party.** 1987  
 5:30  
 Video  
 Collection of the artists

*Equipment used in creation of video includes digital frame buffer, McArthur Digitizer, Jones luminance keyer and Jones & Paik/Abe colorizer.*

Susan Amkraut and Anne Seidman  
**The Blue Chair.** 1986  
 2:08  
 Video  
 Courtesy Anne Seidman

*Video created in part on a VAX 11/780 with an Evans and Sutherland PS-330 at Ohio State University, Computer Graphics Research Group with custom designed three dimensional texture mapping and animation software.*

Peer Bode  
**Art of Memory.** 1985  
 3:00  
 Video  
 Collection of the artist

*Video was produced at the Experimental Television Center in Owego, New York and was created with a prototype digital video frame buffer and a CAT-100 z-80 8-bit computer field buffer, Paik/Abe colorizer, and Jones colorizer, keyers and oscillators.*

Amber Denker  
**Nagasaki.** 1986  
 3:05  
 Video  
 Collection of the artist

**Manly Yes, But I Like it Too.** 1985  
 2:35  
 Video  
 Collection of the artist

*Equipment used includes a VAX11/780 and Ikonas frame buffers with New York Institute of Technology software.*

Yvonne Dignard  
**Peccadillos.** 1986  
 15:22  
 Video  
 Collection of the artist

*This video uses computer effects as transitions between black and white 16mm film and color video.*

Matt Elson  
**Maya: The Dream of Reality.** 1985  
 6:00  
 Video  
 Courtesy Picture Start, Champaign, IL

*Video utilizes two-dimensional computer graphics, videotaped live action, and Quantel Paintbox images.*

Ed Emshwiller  
**Skin Matrix S.** 1987  
 9:00  
 Video  
 Courtesy of the artist

*This video is a tapestry of organic, inorganic, electronic, and imaginary images. Imagery was captured on both video and in slide form as well as created on a Bally Arcade home computer and combined with pre-recorded videotapes on a Grass Valley switcher and a CMX 340 computer editing system.*

James D. Gibson  
**Bodiless Whisper Again.** n.d.  
 6:00  
 Video  
 Collection of the artist

*Equipment used includes a Commodore Amiga computer with Deluxe Paint and Aegis animator software.*

Mark Gilliland  
**Chernobyl West.** 1986  
 6:50  
 Video  
 Collection of the artist

*The video was created in part with an AT&T Targa video adapter card in an IBM PC with TIPS software to grab video images and manipulate them. Additionally, a Fairlight CVI was used to digitally process live-action and pre-recorded images.*

Linda Gottfried  
**Gyro-Glyphics.** 1985  
 6:45  
 Video  
 Collection of the artist

*Gyro-Glyphics began as a series of black and white drawings that were digitized into a Via Video 1E system. With this computer, color was added. The images were then modified, cut, and pasted, resulting in an animated painting.*

Sara Hornbacher  
**Writing Degree Z.** 1985  
 5:00  
 Video  
 Collection of the artist  
 Courtesy Robert Natowitz and The Kitchen, New York

*Writing Degree Z* was created using interactive analog and digital electronic imaging and control devices. A Cromenco frame buffer, Jones raster deflecting device, and wave-form system at the Experimental Television Center were used.

Hilja Keading  
**I Am.** 1986  
 00:19  
 Video  
 Collection of the artist

**What Matters.** 1986  
 00:29  
 Video  
 Collection of the artist

**Give.** 1986  
 00:30  
 Video  
 Collection of the artist

**I Got What I Wanted.** 1986  
 00:05  
 Video  
 Collection of the artist

*Conceptual imagery was produced with computer generated graphics created with a Chyron VP1 system.*

Maria Manhattan  
**Nancy Reagan Takes the Subway.** 1986  
 2:44  
 Video  
 Collection of the artist

*Created on an AT&T FCS 350.*

Maureen Nappi  
**Processional.** 1985  
 1:24  
 Video  
 Collection of the artist

*This video utilizes in part the Quantel/Sony all-digital video system to combine both Quantel Paintbox elements with live action and dimensional perspective moves with audio, in a single system.*

Stefan Roloff  
**Big Fire.** 1986  
 2:30  
 Video  
 Collection of the artist

*Video created on an Images II paint system and animated into an endless sequence.*

Matthew Schlanger  
**Before the Flood.** 1985  
 4:50  
 Video  
 Collection of the artist

*The work was produced with custom hardware built by the artist as well as software from the Experimental Television Center and also utilizing a CAT frame buffer with Strobe 64 software written by David Jones.*

Teckon  
**Elephant and Naughty Dove.** 1986  
 8:30  
 Video  
 Collection of the artist

Naoko Tosa  
**Trip.** 1985  
 8:00  
 Video  
 Collection of the artist

*Video created with Mirage hardware and Videographics Aurora system software.*

Woody and Steina Vasulka  
**ECCE.** 1987  
 4:00  
 Video, one channel of a two-channel installation.  
 Collection of the artists

*Equipment used includes an Image Articulator designed and built by Don Macarthur and Jeffy Scnier in cooperation with the Vasulkas and the Rutt/Etra scan processor designed and built by Steve Rutt and Bill Etra.*

Jane Veeder  
**4KTape.** 1986  
 3:26  
 Video  
 Collection of the artist

*Hardware and software used in this work are UV-1/Zgrass Graphics computer, Sony videotape editor, Arp 2600 and Prophet 10 Audio Synthesizers, and E-mu Emulator II with custom software programmed in Zgrass.*

Tanya Weinberger  
**Z.** 1986  
 3:45  
 Video  
 Collection of the artist

*Cartoon produced on the high resolution Artronics paint system at Telesis Productions, Inc.*

Ann-Sargent Wooster  
**Carmen.** 1986  
 7:00  
 Video  
 Collection of the artist

**Trains or How I Almost Killed My Sister Katy.** 1985  
 12:00  
 Video  
 Collection of the artist

*Images created from processed footage using David Jones' Tespot and Strobe 64 computer programs at the Experimental Television Center and Jones' computer digitizing module to further manipulate portions of the videos.*

Edward Zajec

**Chromas 2.** 1987

7:00

Video

Collection of the artist

*Animation video uses Turbo Pascal and Multi-Halo graphics software on a Zenith 151 PC system with a Number Nine graphics board.*

Neil Zusman

**Time Witness.** 1986

11:00

Video

Collection of the artist

**A State of Air.** 1986

5:00

Video

Collection of the artist

*These videos use the Fairlight Computer Video Instrument. Selected segments were produced at the Experimental Television Center.*

## Biographies

### Merrill Aldighieri and Joe Tripican

#### Born

- 1952 Merrill Aldighieri, Englewood, NJ  
1953 Joe Tripican, Atlantic City, NJ

#### Education

- Merrill Aldighieri  
1974 B.F.A., Massachusetts  
College of Art, Boston, MA
- Joe Tripican  
1975 B.A., American University,  
Washington, DC  
1978 M.F.A., Columbia University, New  
York, NY

#### Selected Exhibitions

- 1982 *Video-Music: New Correlations*,  
Whitney Museum of American Art,  
New York, NY
- 1983 *9th Annual Ithaca Video  
Festival*, Imagine Video, Inc.,  
Ithaca, NY
- 1984 *So There, Orwell*, New Orleans  
World's Fair, New Orleans, LA
- 1984 *Glittering Obsessions: 4th  
Daniel Wadsworth Memorial  
Video Festival*, Hartford, CT
- 1984 *Meet the Makers*,  
Donnell Film Library, New York, NY
- 1986 *The Other New York*, National  
Video Festival, The American Film  
Institute, Los Angeles, CA

### Mel Alexenberg

#### Born

- 1937 New York, NY

#### Education

- 1958 B.S., Queens College, New York, NY  
1959 M.S., Yeshiva University,  
New York, NY  
1969 Ph.D., New York University,  
New York, NY

#### One-Person Exhibitions

- 1987 Fine Art Museum of Long Island,  
Hempstead, NY

- 1987 Pratt Institute, Manhattan Gallery,  
New York, NY  
1987 Horace Richter Gallery, Old Jaffa,  
Israel

#### Group Exhibitions

- 1983 *Sky Art '83*, BMW Museum,  
Munich, Federal Republic of Germany  
1986 *Imagining Antartica*, State  
Museum, Linz, Austria  
1987 *Transformations*, Reynolds  
Gallery, University of the Pacific,  
Stockton, CA

### Susan Amkraut and Anne Seidman

#### Born

- 1958 Susan Amkraut, San Francisco, CA  
1950 Anne Seidman, Philadelphia, PA

#### Education

- Susan Amkraut  
1983 B.F.A., University of California at  
Santa Cruz, Santa Cruz, CA
- Anne Seidman  
1973 B.F.A., Pennsylvania Academy of  
the Fine Arts, coordinated with the  
Philadelphia College of Art,  
Philadelphia, PA  
1986 M.A., Ohio State University,  
Columbus, OH  
1986 M.F.A., University of Wisconsin,  
Milwaukee, WI

#### Selected Exhibitions

- Susan Amkraut  
1984 *Computer Generated Graphics and  
Animation*, The Ohio Foundation of the  
Arts, Ohio State University,  
Columbus, OH  
1984 SIGGRAPH, Minneapolis, MN  
1985 SIGGRAPH, San Francisco, CA  
1986 *Biennale de Venezia*, Venice, Italy  
1986 SIGGRAPH, Dallas, TX

- Anne Seidman  
1981 *Rutgers National Works on Paper*,  
Stedman Art Gallery, Rutgers  
University Camden, NJ



- 1985 *Emerging Expression: The Artist and The Computer*, The Bronx Museum of the Arts, Bronx, NY
- 1985 SIGGRAPH, San Francisco, CA
- 1985 *Computer Generated Graphics and Animation*, The Ohio Foundation of the Arts, University of Akron, Akron, OH
- 1986 *Computer Arts '86*, Shwayder Art Gallery, University of Denver, Denver, CO.
- 1986 *5th Annual Pacific Northwest Computer Graphics Conference*, University of Oregon, Eugene, OR
- 1986 SIGGRAPH Dallas, TX

### Carlos Arguello

#### Born

- 1963 Managua, Nicaragua

#### Education

- 1984 B.F.A., Academy of Art College, San Francisco, CA

#### Selected Exhibitions

- 1984 *Senior Show*, Academy of Art College, San Francisco, CA
- 1985 SIGGRAPH, San Francisco, CA
- 1985 *Future World Expo*, Moscone Convention Center, San Francisco, CA
- 1986 SIGGRAPH, Dallas, TX
- 1986 *Artware, Kunst und Elektronik*, Intermedia Congress, Hanover, Federal Republic of Germany

### (Art)<sup>n</sup> Laboratory

(Donna Cox, Tom De Fanti, George Francis, Ray Ikszak, Daniel John Sandin, Ellen Sandor)

#### Selected Group Exhibitions

- 1985 SIGGRAPH, San Francisco, CA
- 1986 *Seeing is Believing*, Fort Wayne Art Museum, Fort Wayne, IN
- 1987 *Rated X: A Group Experience*, Neikrug Gallery, New York, NY

- 1987 *The Non-Spiritual in Art: Abstract Painting 1980 - ????*, Chicago, IL
- 1987 *Nature, Feature*, Chicago, IL
- 1987 SIGGRAPH, Anaheim, CA

### Colette and Charles Bangert

#### Born

- 1934 Colette Bangert, Columbus, OH
- 1938 Charles Bangert, Fargo, ND

#### Education

- Colette Bangert
- 1957 B.F.A., John Herron Art Institute, Indianapolis, IN
- 1958 M.F.A., Boston University, Boston, MA

Charles Bangert

- 1961 B.A., University of North Dakota, Grand Forks, ND

#### Two-Person Exhibitions

- 1984 Batz/Lawrence Gallery, Kansas City, MO
- 1985 Mulvane Art Center, Topeka, KS
- 1986 Kellas Gallery, Lawrence, KS

#### Group Exhibitions

- 1982 SIGGRAPH, Boston, MA
- 1983 *Art for the Computer Age*, Kipp Fine Arts Gallery, Indiana University of Pennsylvania, Indiana, PA
- 1983 *The Artist and the Computer*, Louisville Art Gallery, Louisville, KY
- 1985 *Recent Computer and Hand Work*, Mulvane Art Center, Topeka, KS
- 1985 *The Artist and the Computer II*, Louisville Art Gallery, Louisville, KY
- 1985 *Computer Assisted Art*, Ben Shahn Galleries, William Paterson College, Wayne, NJ
- 1986 SIGGRAPH, Dallas, TX

### Steven David Beck

#### Born

- 1959 San Diego, CA

### Education

- 1981 B.A., University of California at Los Angeles, Los Angeles, CA
- 1983 M.A., University of California at Los Angeles, Los Angeles, CA

### Selected Exhibitions

- 1985 *International Computer Music Conference*, Vancouver, British Columbia, Canada
- 1986 *New American Music in Europe*, Cité International des Arts, Paris, France
- 1985 *New Music America/Los Angeles*, University of Southern California, Los Angeles, CA
- 1986 *Mega Concert '86*, San Francisco Contemporary Musics, San Francisco, CA

### Terry Blum

#### Born

- 1939 New York, NY

#### Education

- B.F.A., Boston University, Boston, MA

#### Selected Exhibitions

- 1983 SIGGRAPH, Detroit, MI
- 1983 *Women in Computer Graphics: An Art For the Future*, Roanoke College, Salem, VA
- 1984 *Computer Generated Works on Paper*, Columbia University, New York, NY
- 1985 *Artware, Kunst und Elektronik*, Intermedia Congress, Hamburg, Federal Republic of Germany
- 1985 *The Computer and Its Influence on Art & Design, Part II*, Concordia College, Seward, NB
- 1986 SIGGRAPH, Dallas TX

### Peer Bode

#### Born

- 1952 Rosenheim, Federal Republic of Germany

**Education**

- 1974 B.A., State University of New York at Binghamton, Binghamton, NY  
 1978 M.A.H., State University of New York at Buffalo, Buffalo, NY

**One-Person Exhibitions**

- 1979 Museum of Modern Art, New York, NY  
 1985 University of Toledo, Toledo, OH  
 1986 State University of New York at Binghamton, Binghamton, NY

**Group Exhibitions**

- 1985 *Emerging Expression: The Artist and The Computer*, The Bronx Museum of the Arts, Bronx, NY  
 1985 *The Artist & the Computer, Personal Visions In a New Age*, Leonard Davis Center for the Arts, City College of New York, New York, NY  
 1986 *Techno Bop III*, Anthology Film Archives, New York, NY  
 1986 *The Other New York*, National Video Festival, The American Film Institute, Los Angeles, CA  
 1987 *The 1987 Whitney Biennial*, Whitney Museum of American Art, New York, NY

**P. Michael Brakke****Born**

1943 Douglas, AZ

**Education**

- 1966 B.A., University of Minnesota, St. Paul, MN  
 1968 M.F.A., Yale University, New Haven, CT

**One-Person Exhibitions**

- 1980 Joslyn Art Museum, Omaha, Nebraska  
 1985 Marianne Deson Gallery, Chicago, IL  
 1987 High Museum of Art, Atlanta, GA

**Group Exhibitions**

- 1981 *Prints + Multiples: 79th Exhibition*, Museum of Contemporary Art, The School of the Art Institute of Chicago, Chicago, IL

- 1982 *Painting and Sculpture Today*, Indianapolis Museum of Art, Indianapolis, IN  
 1984 *Alternative Spaces: A History in Chicago*, Museum of Contemporary Art, The School of the Art Institute of Chicago, Chicago, IL  
 1985 *Electronic Images*, Creative Arts Center, University of Colorado at Colorado Springs, Colorado Springs, CO

**Edgar Buonagurio****Born**

1946 Yonkers, NY

**Education**

- 1969 B.A., City College of New York, New York, NY  
 1972 M.A., Columbia University, New York, NY

**One-Person Exhibitions**

- 1983 Everson Museum of Art of Syracuse and Onondaga County, Syracuse, NY  
 1984 Andre Zarre Gallery, New York, NY  
 1986 Hadler/Rodriguez Gallery, Houston, TX

**Group Exhibitions**

- 1985 *Layering: An Art of Time and Space*, Albuquerque Museum, Albuquerque, NM  
 1985 *Works From the Permanent Collection*, Mint Museum of Art, Charlotte, NC  
 1986 *Unique Selections of Work from Contemporary Artists*, Gloria Luria Gallery, Bay Harbor Islands, FL

**Sydney Cash****Born**

1941 Detroit, MI

**Education**

- 1962 L'Alliance Francaise, Paris, France  
 1965 B.S., Wayne State University, Detroit, MI

**One-Person Exhibitions**

- 1984 Heller Gallery, New York, NY  
 1985 General Electric Atrium Gallery, Schenectady, NY  
 1986 Windows on White Street, New York, NY

**Group Exhibitions**

- 1983 *Transparent Structures*, Thorpe Intermedia Gallery, Sparkill, NY  
 1985 *Chanukah Exhibition '85*, The Jewish Community Museum, San Francisco, CA  
 1986 *Glass America*, Heller Gallery, New York, NY

**Rodney Disco-Doc Chang****Born**

1945 Honolulu, HI

**Education** (selected)

- 1960 B.A., University of Hawaii, Manoa, HI  
 1972 D.D.S., Loyola University, HI  
 1975 M.A., University of Northern Illinois, Dekalb, IL

**Selected Exhibitions**

- 1985 *Grand Opening*, SOHO too Gallery and Loft, Honolulu, HI  
 1986 *Computer Abstracts*, Central Pacific Bank, Honolulu, HI  
 1986 *Proper Advances*, IDEA Gallery, Sacramento, CA  
 1986 *Digital Art*, Royal Culture Art Gallery, Honolulu, HI  
 1986 *36th Annual Artists of Hawaii Juried Exhibition*, Honolulu, HI  
 1987 *Rodney Chang Retrospective*, Ramsey Gallery, Honolulu, HI

**Donna J. Cox****Born**

1949 Enid, OK

**Education**

- 1982 B.A., University of Wisconsin, Madison, WI

1985 M.F.A., University of Wisconsin, Madison, WI

#### Selected Exhibitions

- 1983 SIGGRAPH, Orange, CA  
 1984 *States of the Arts 1980s*, Museum of Western Colorado, Grand Junction, CO  
 1985 *Technology in Art*, Cudahy Gallery, Milwaukee Museum of Art, Milwaukee, WI  
 1986 *Cade '86, Video Competition*, Oakville, Ontario, Canada  
 1987 *Compulage*, Frick Art Museum, Wooster, OH

#### Amber Denker

##### Born

1959 New York, NY

##### Education

1982 B.F.A., Carnegie-Mellon University, Pittsburgh, PA

#### Selected Exhibitions

- 1982 *Amber Denker*, Forbes Street Gallery, Pittsburgh, PA.  
 1985 SIGGRAPH, San Francisco, CA  
 1985 *Computer Age*, New Math Gallery, New York, NY  
 1986 *San Francisco Video Festival*, San Francisco, CA  
 1986 SIGGRAPH, Dallas, TX

#### Robert E. Dewar

##### Born

1943 Chicago, IL

##### Education

1971 B.A., California State University at Los Angeles, Los Angeles, CA

#### Selected Exhibitions

- 1981 *Congressional Exhibition of High Technology Art*, Library of Congress, Washington, DC

1981 *Waves In Space/New Art and Technology*, Downey Museum of Art, Downey, CA

1982 *The Voice in the Machine: The Computer in the Visual Arts*, Triangle Gallery, Mercer County Community College, Trenton, NJ

#### Yvonne Dignard

##### Born

1957 Toronto, Canada

##### Education

1982 B.A., University of Guelph, Ontario, Canada

#### Selected Exhibitions

- 1986 *New Works Show*, Theatre Paffe Muraille, Toronto, Ontario, Canada  
 1987 *International Festival of Women*, Montreal, Canada  
 1987 *Festival des Vues des Filles*, Quebec City, Canada  
 1987 *Festival de Film et Video*, Milieu, Montreal, Canada

#### Matt Elson

##### Born

1957 San Francisco, CA

##### Education

1982 B.F.A., Pratt Institute, Brooklyn, NY  
 1986 M.A., New York Institute of Technology, New York, NY

#### Selected Exhibitions

- 1986 SIGGRAPH, Dallas, TX  
 1986 *Artech '86*, Master Eagle Gallery, New York, NY

#### David Em

##### Born

1952 Los Angeles, CA

#### Education

1972 Pennsylvania Academy of Fine Art, Philadelphia, PA

#### One-Person Exhibitions

- 1980 Silverworks Gallery, Los Angeles, CA  
 1983 Carpenter Center for the Visual Arts, Harvard University, Cambridge, MA  
 1984 Orange County Center for Contemporary Art, Santa Ana, CA

#### Group Exhibitions

- 1984 *Electra*, Musee de l'art Modern de la Ville de Paris, Centre Georges Pompidou, Paris, France  
 1985 *Emerging Expression: The Artist and The Computer*, The Bronx Museum of the Arts, Bronx, NY  
 1986 *The Artist and the Computer III*, Louisville Art Gallery, Louisville, KY  
 1986 SIGGRAPH, Dallas, TX

#### Ed Emshwiller

##### Born

1925 Lansing, MI

##### Education

University of Michigan, Ann Arbor, MI  
 Ecole des Beaux Arts, Paris, France  
 Art Students League, New York, NY

#### Selected Exhibitions

- 1984 *Los Angeles Olympic Arts Festival*, Los Angeles, CA  
 1984 SIGGRAPH, San Francisco, CA  
 1985 *1st Tokyo Video Biennial*, Tokyo, Japan  
 1985 *The 1985 Whitney Biennial*, Whitney Museum of American Art, New York, NY  
 1985 *The Sao Paulo Biennial*, Sao Paulo, Brazil  
 1986 *L'immagine Electronica*, Bologna, Italy

**Eudice Feder****Born**

1919 Korzek, Poland

**Education**

1974 B.A., California State University at Northridge, Northridge, CA  
 1980 M.A., California State University at Northridge, Northridge, CA

**Selected Exhibitions**

1982 SIGGRAPH, Boston, MA  
 1983 *Women in Design*, Pacific Design Center, Los Angeles, CA  
 1984 *Electra*, Musee de l'art Modern de la Ville de Paris, Centre Georges Pompidou, Paris, France  
 1985 *Emerging Expression: The Artist and The Computer*, The Bronx Museum of the Arts, Bronx, NY  
 1985 SIGGRAPH, San Francisco, CA  
 1986 SIGGRAPH, Dallas, TX

**Jürgen Lit Fischer****Born**

1940 Frankfurt, Federal Republic of Germany

**Selected Exhibitions**

1977 *Internationals Symposium für Plastik*, Lindau, Federal Republic of Germany  
 1982 *Grosse Kunstausstellung*, Dusseldorf, Federal Republic of Germany  
 1985 SIGGRAPH, San Francisco, CA  
 1986 SIGGRAPH, Dallas, TX

**Rob Fisher****Born**

1939 Cleveland, OH

**Education**

1961 B.S., Massachusetts Institute of Technology, Boston, MA

1965 M.S., Syracuse University, Syracuse, NY

**One-Person Exhibitions**

1983 Visible Language Workshop, Massachusetts Institute of Technology, Cambridge, MA  
 1984 Kern Galleries, Pennsylvania State University, State College, PA  
 1985 Pittsburgh Center for the Arts, Pittsburgh, PA

**Group Exhibitions**

1982 SIGGRAPH, Boston, MA  
 1984 *Electra*, Musee de l'art Modern de la Ville de Paris, Centre Georges Pompidou, Paris, France  
 1986 *Outdoor Sculpture Invitational*, Southern Alleghenies Museum of Art, Loretto, PA  
 1986 SIGGRAPH, Dallas, TX

**Jeremy Gardiner****Born**

1957 Muenster, Federal Republic of Germany

**Education**

1979 B.A., Newcastle University, Newcastle, England  
 1983 M.F.A., Royal College of Art, London, England

**One-Person Exhibitions**

1983 Hirst Research Center, London, England  
 1985 Boston University Art Gallery, Boston University, Boston, MA  
 1987 Compton Gallery, Massachusetts Institute of Technology, Cambridge, MA

**Group Exhibitions**

1985 *State of the Art*, Twining Gallery, New York, NY  
 1985 *Emerging Expression: The Artist and The Computer*, The Bronx Museum of the Arts, Bronx, NY

1986 *Artists in the Computer Age*, Owens-Illinois Gallery, Owens - Illinois Art Center, Toledo, OH  
 1986 *The Artist and the Computer III*, Louisville Art Gallery, Louisville, KY

**Laurence M. Gartel****Born**

1956 New York, NY

**Education**

1977 B.F.A., School of Visual Arts, New York, NY

**Selected Exhibitions**

1983 *The Artist and The Computer*, Long Beach Museum of Art, Long Beach, CA  
 1982 *Emerging Artists*, Museum of Art, University of Oklahoma, Norman, OK  
 1984 *Computer Art*, Institute for Art and Urban Resources, P.S. 1, Long Island City, NY  
 1985 *Emerging Expression: The Artist and The Computer*, The Bronx Museum of the Arts, Bronx, NY  
 1985 SIGGRAPH, San Francisco, CA  
 1986 *Art et Nouvelles Technologies*, Montreal, Canada  
 1986 SIGGRAPH, Dallas, TX  
 1987 *Forty Years of Posters for the School of Visual Arts*, Cooper-Hewitt Museum, New York, NY

**Rachel Gellman****Born**

1950 New York, NY

**Education**

1972 B.S., Cornell University, Ithaca, NY

**Selected Exhibitions**

1984 *Puck Building Computer Show*, The Puck Building, New York, NY  
 1985 *Computer Images*, CDC Gallery, New York, NY

- 1985 *College Artists and the Computer*, Skidmore College, Saratoga Springs, NY
- 1985 SIGGRAPH, San Francisco, CA
- 1986 *Computer Art: Two Views*, Parsons Gallery, Parsons School of Design, New York, NY
- 1986 *Art from the Computer*, California College of Arts and Crafts, Oakland, CA

### James D. Gibson

#### Born

1938 Milbank, SD

#### Education

B.F.A., Illinois Wesleyan University, Bloomington, IL  
M.F.A., Ohio University, Athens, OH

#### Selected Exhibitions

- 1985 *26th Midwestern Exhibition*, The Plains Art Museum, Moorhead, MN.
- 1986 SIGGRAPH, Dallas, TX
- 1986 *Inexplicable Synthetic Persona*, Apple II World Convention, San Francisco, CA
- 1986 *Artists of the Fantastic*, Delaware Museum of Art, Wilmington, DE
- 1986 *Studio Visits*, North Dakota Museum of Art, Grand Forks ND

### Mark Gilliland

#### Born

1954 Seattle, WA

#### Education

1976 B.F.A., Virginia Commonwealth University, Richmond, VA

#### One-Person Exhibitions

- 1980 A.R.E. Gallery, San Francisco, CA
- 1981 Mudd Club, New York, NY
- 1983 Anthology Film Archives, New York, NY

#### Group Exhibitions

- 1982 *BACA Video Festival*, Brooklyn Arts and Cultural Association, Brooklyn, NY
- 1986 *The Other New York*, National Video Festival, American Film Institute, Los Angeles, CA
- 1987 *Techno Bop '87*, The Kitchen, New York, NY

### Linda Gottfried

#### Born

1953 Detroit, MI

#### Education

1979 B.F.A., Academy of Art College, San Francisco, CA

#### Selected Exhibitions

- 1985 *Screening of Member's Works*, Film/Video Arts, Inc., New York, NY
- 1985 SIGGRAPH, San Francisco, CA
- 1986 SIGGRAPH, Dallas, TX
- 1986 *New York Siggraph Electronic Theatre Exhibition*, Limelight, New York, NY
- 1986 WETA, Channel 26, Washington, DC
- 1986 *International/Showtime*, The Movie Channel.
- 1987 SIGGRAPH, Los Angeles, CA
- 1987 *"Would You Have Signed the Constitution?,"* National Archives, Washington, DC

### Karen Guzak

#### Born

1939 Cambridge, MA

#### Education

1961 B.Sc., University of Colorado, Denver, CO

1976 B.F.A., Cornish Institute of Applied Arts, Seattle, WA

#### One-Person Exhibitions

- 1982 Harris Gallery, Houston, TX

- 1985 Fountain Gallery of Art, Portland, OR
- 1986 Shoshana Wayne Gallery, Los Angeles, CA

#### Group Exhibitions

- 1983 *Contemporary Seattle Art*, Bellevue Art Museum, Bellevue, WA
- 1985 *Western States Print Invitational*, Portland Art Museum, Portland, OR
- 1986 *NW Impressions: Works on Paper*, Henry Art Gallery, University of Washington, Seattle, WA
- 1986 *Northwest Now*, Tacoma Art Museum, Tacoma, WA

### Carter Hodgkin

#### Born

1952 Warrenton, VA

#### Education

1976 B.F.A., Virginia Commonwealth University, Richmond, VA

#### One-Person Exhibitions

- 1980 A.R.E. Gallery, San Francisco, CA
- 1983 Gallery Nature Morte, New York, NY

#### Group Exhibitions

- 1981 *Three New Yorkers*, Gallery White Art, Tokyo, Japan
- 1983 *Group Show*, Soho Center for Visual Arts, New York, NY
- 1986 *Update*, White Columns, New York, NY
- 1987 *The Drawing Center, Selection 37*, The Drawing Center, New York, NY
- 1987 *Stux Gallery Invitational Exhibition*, Stux Gallery, New York, NY

### Sara Hornbacher

#### Born

Fargo North Dakota



**Education**

- 1972 B.S., North Dakota State University, Fargo, ND  
 1975 B.F.A., Moorhead State University, Moorhead, MN  
 1978 M.A.H., Center for Media Studies, State University of New York at Buffalo, Buffalo, NY

**Selected Exhibitions**

- 1985 *Emerging Expression: The Artist and The Computer*, The Bronx Museum of the Arts, Bronx, NY  
 1985 *Video as Paper*, Film/Video Arts, Inc., New York, NY  
 1985 *The Artist & the Computer, Personal Visions In a New Age*, Leonard Davis Center for the Arts, City College of New York, New York, NY  
 1985 *Alternating Currents*, Alternative Museum, New York, NY  
 1985 *Computer Age*, New Math Gallery, New York, NY  
 1986 *"Everything But..."* The Kitchen, New York, NY

**Gerald Hushlak****Born**

- 1944 Alberta, Canada

**Education**

- 1973 M.A.R.C.A., Royal College of Art, London, England

**One-Person Exhibitions**

- 1981 Canada House, London, England  
 1982 Art Gallery of Greater Victoria, Victoria, British Columbia, Canada  
 1982 Mandel Art Gallery, Saskatoon, Saskatchewan, Canada

**Group Exhibitions**

- 1978 *World Print Competition*, San Francisco Museum of Modern Art, San Francisco, CA  
 1984 *Electra*, Musee de l'art Modern de la Ville de Paris, Centre Georges Pompidou, Paris, France  
 1986 SIGGRAPH, Dallas, TX

**Lorna Pauly Jordan****Born**

- 1954 Windsor, Ontario, Canada

**Education**

- 1976 B.A., University of Virginia, Charlottesville, VA

**Selected Exhibitions**

- 1984 *Group Show*, 911 Gallery, Seattle, WA  
 1985 *Neo York/Seattle*, Center on Contemporary Art, Seattle, WA  
 1986 *Tech Art*, North Seattle Community College, Seattle, WA  
 1986 *New Dimensions in Art*, Bumbershoot Arts Festival, Seattle, WA  
 1986 *Computer Graphics Art*, Northwest Pacific Computer Graphics Convention, Eugene, OR  
 1987 *Lorna Jordan*, Northwest Artists Workshop, Portland, OR

**Hilja Keating****Born**

- 1960 Berkeley, CA

**Education**

- 1982 B.F.A., University of California at Los Angeles, Los Angeles, CA  
 1986 M.F.A., University of California at Los Angeles, Los Angeles, CA

**Selected Exhibitions**

- 1985 *Pathway*, White Room Gallery, University of California at Los Angeles, Los Angeles, CA  
 1986 *Emerging Artists*, Frederick S. Wight Art Gallery, Los Angeles, CA

**Isaac Victor Kerlow****Born**

- 1958 Mexico City, Mexico

**Education**

- 1979 Certificate in Art and Design, Eina School of Design, Barcelona, Spain  
 1981 B.F.A., School of Visual Arts, New York, NY  
 1983 M.S., Pratt Institute, Brooklyn, NY

**One-Person Exhibitions**

- 1985 Fundación Joan Miro, Barcelona, Spain  
 1986 Museum of Modern Art, Mexico City, Mexico  
 1986 Casa de la Cultura, Monterrey, Mexico

**Group Exhibitions**

- 1984 *Works on Paper*, Columbia University, New York, NY  
 1985 *Emerging Expression: The Artist and The Computer*, The Bronx Museum of the Arts, Bronx, NY  
 1985 SIGGRAPH, San Francisco, CA  
 1986 *Art from the Computer*, California College of Arts and Crafts, Oakland, CA  
 1987 *Toward a New Vision: The Art of Michael O'Rourke and Isaac Victor Kerlow*, Goucher College, Baltimore, MD

**Ruth Leavitt****Born**

- 1944 St. Paul, MN

**Education**

- 1969 B.A., University of Minnesota, Minneapolis, MN  
 1987 M.F.A., State University of New York at Buffalo, Buffalo, NY

**One-Person Exhibitions**

- 1984 Burchfield Art Center, Buffalo, NY  
 1987 Shippensburg University Art Gallery, Shippensburg, PA

**Group Exhibitions**

- 1981 *International Exhibition of Computer Art*, Palais des Beaux-Arts, Brussels, Belgium

- 1983 *Women and Computer Graphics: An Art for the Future*, Roanoke College, Salem, VA
- 1984 *Contemporary Art Acquisitions: 1980-1983*, The Equitable Gallery, Whitney Museum of American Art, New York, NY
- 1985 *High Tech Art*, Colorado Springs Gallery of Contemporary Art, University of Colorado at Colorado Springs, Colorado Springs, CO

### Tom Lesser

**Born**  
1956 New York, NY

**Education**  
1976 B.F.A., San Francisco Art Institute, San Francisco, CA  
1978 M.F.A., San Francisco Art Institute, San Francisco, CA

**One-Person Exhibitions**  
1983 Hampshire College, Amherst, MA  
1983 Millennium Film Workshop, New York, NY

**Group Exhibitions**  
1982 *Filmworks*, The Kitchen, New York, NY  
1983 *Contemporary Collage*, Claremont College, Claremont, CA  
1985 *Emerging Expression: The Artist and The Computer*, The Bronx Museum of the Arts, Bronx, NY  
1985 *Made for TV Festival*, Institute of Contemporary Art, Boston, MA  
1985 SIGGRAPH, San Francisco, CA

### Tony Longson

**Born**  
1948 Stockport, England

**Education**  
1971 B.A., Reading University, Reading, England

**One-Person Exhibitions**  
1972 Galerie Mathoom, The Hague, The Netherlands  
1976 The Hatfield Polytechnic, Herefordshire, England

**Group Exhibitions**  
1981 *Waves in Space: New Art and Technology*, Downey Museum of Art, Downey, CA  
1983 *The Artist and the Computer*, Long Beach Museum of Art, Long Beach, CA  
1986 SIGGRAPH, Dallas TX  
1986 *Computer Graphics Art*, Pacific Northwest Computer Graphics Convention, Eugene, OR

### Margot Lovejoy

**Born**  
1930 Campbellton, New Brunswick, Canada

**Education**  
1951 St. Martin's School of Art, London, England  
1971 Pratt Graphics Center, New York, NY  
1983 New York University, New York, NY

**One-Person Exhibitions**  
1980 Donnell Film Library, New York Public Library, New York, NY  
1982 MacIntosh Gallery, Glasgow, Scotland  
1984 Soho 20, New York, NY

**Group Exhibitions**  
1983 *Electra*, Musee de l'art Moderne de la Ville de Paris, Centre Georges Pompidou, Paris, France  
1984 *New Media II*, Malmo Konsthall, Malmo, Sweden  
1985 *Emerging Expression: The Artist and The Computer*, The Bronx Museum of the Arts, Bronx, NY  
1986 *Artists in the Computer Age*, Owens-Illinois Gallery, Owens-Illinois Art Center, Toledo, OH

### Ronald MacNeil

**Born**  
1941 Wichita, KS

**Education**  
1971 B.S., Massachusetts Institute of Technology, Boston, MA  
1976 M.F.A., Rhode Island School of Design, Providence, RI

**One-Person Exhibitions**  
1970 Opal Gallery, Marblehead, MA  
1971 University of Maine, Orono, ME  
1974 University of New Hampshire, Durham, NH

**Group Exhibitions**  
1982 *The AIGA Annual Exhibition*, AIGA Gallery, American Institute of Graphic Arts, New York, NY  
1983 SIGGRAPH, Detroit, MI  
1983 *Selections from the Visible Language Workshop*, Watari Gallery, Tokyo, Japan  
1985 *Emerging Expression: The Artist and the Computer*, The Bronx Museum of the Arts, Bronx, NY  
1986 *Artists in the Computer Age*, Owens-Illinois Gallery, Owens-Illinois Art Center, Toledo, OH

### Robert Mallary

**Born**  
1917 Toledo, OH

**Education**  
1939 La Escuela de las Artes del Libro, Mexico City, Mexico  
1941 Laboratory Workshop School, Boston, MA

**Selected Exhibitions**  
1982 SIGGRAPH, Boston, MA  
1983 *Digicon '83, International Conference of Digital Arts*, Vancouver, British Columbia, Canada

- 1985 *Six Artists Using the Computer*,  
East End Arts Council,  
Riverhead, NY
- 1985 *The Artist and the Computer II*,  
Louisville Art Gallery,  
Louisville, KY,
- 1986 SIGGRAPH, Dallas, TX

### Maria Manhattan

#### Born

1947 Brooklyn, NY

#### Selected Exhibitions

- 1979 *Maria Manhattan: The Box Lunch*, College of Marin, Kentfield and San Francisco, CA
- 1986 *Visions of US*, American Film Institute, Los Angeles, CA
- 1987 "'Y' Maria Manhattan and Betsy Newman Read From 'W,'" Paper Tiger Television, Public Access Station, New York, NY

### John W. Manning

#### Born

1950 Wilmet, IL

#### Education

- 1974 B.A., University of Chicago,  
Chicago, IL
- 1981 M.F.A., School of the Art Institute of  
Chicago, Chicago, IL

#### One-Person Exhibitions

- 1985 Anthology Film Archives,  
New York, NY
- 1986 Boston Film/Video Foundation,  
Boston, MA

#### Group Exhibitions

- 1986 *Making Waves*, Evanston Art  
Center, Evanston, IL
- 1987 *Sao Paulo International Biennial*,  
Sao Paulo, Brazil

### Robert Martin

#### Born

1956 Bainbridge, GA

#### Education

- 1978 B.S., Florida A & M University,  
Tallahassee, FL
- 1981 M.F.A., University of Wisconsin,  
Madison, WI

#### One-Person Exhibitions

- 1983 Fine Arts Gallery, Alabama A & M  
University, Normal, AL
- 1984 Gallery 5, Montgomery Museum of  
Fine Arts, Montgomery, AL
- 1984 I.P. Stanback Museum &  
Planetarium, South Carolina State  
University, Orangeburg, SC

#### Group Exhibitions

- 1985 *Birmingham Biennial*,  
Birmingham Museum of Art,  
Birmingham, AL
- 1986 *Atlanta Life Sixth Annual National  
Art Exhibition*, Atlanta, GA
- 1987 *The Eighth Annual Black Artists  
Exhibition*, J.B. Speed Art Museum,  
Louisville, KY

### Steven L. Mayes

#### Born

1939 Los Angeles, CA

#### Education

- 1963 B.F.A. & B.A.E., Wichita State  
University, Wichita, KS
- 1965 M.F.A., Wichita State University,  
Wichita, KS

#### One-Person Exhibitions

- 1982 Texas A & I University,  
Kingsville, TX
- 1984 Odessa College, Odessa, TX
- 1986 Virginia Intermont College,  
Bristol, VA

#### Group Exhibitions

- 1985 SIGGRAPH, San Francisco, CA

- 1986 *The Computer as Art*,  
Southwest Museum of Science  
and Technology, Dallas, TX
- 1986 SIGGRAPH, Dallas, TX

### Steve Miller

#### Born

1951 Buffalo, NY

#### Education

- 1973 Skowhegan School of Painting  
and Sculpture, Skowhegan, ME
- 1973 B.A., Middlebury College,  
Middlebury, VT

#### One-Person Exhibitions

- 1985 Bette Stoler Gallery, New York, NY
- 1986 Josh Baer Gallery, New York, NY
- 1986 Jack Shainman Gallery,  
Washington, DC

#### Group Exhibitions

- 1983 *Language, Drama, Source &  
Vision*, The New Museum of  
Contemporary Art, New York, NY
- 1984 *Behind Faces & Figures*,  
Philadelphia College of Art,  
Philadelphia, PA
- 1985 *Emerging Expression: The  
Artist and The Computer*, The Bronx  
Museum of the Arts, Bronx, NY
- 1986 *Layers of Vision*, Bette Stoler  
Gallery, New York, NY

### Manfred Mohr

#### Born

1938 Pforzheim, Federal Republic of  
Germany

#### Education

- Keppelergymnasium, Pforzheim,  
Federal Republic of Germany
- Kunst und Werkschule, Pforzheim,  
Federal Republic of Germany

**One-Person Exhibitions**

- 1983 Art Research Center,  
Kansas City, MO
- 1986 Galerie Charley Chevalier,  
Paris, France

**Group Exhibitions**

- 1980 *Printed Art: A View of Two  
Decades*, Museum of Modern  
Art, New York, NY
- 1983 *The Computer and its Influence on Art  
& Design*, Sheldon Memorial Art  
Gallery, University of Nebraska,  
Lincoln, NB
- 1984 *Mathematics: Twentieth Century Art*,  
Baruch College Gallery, Baruch  
College, New York, NY
- 1985 *Emerging Expression: The  
Artist and The Computer*, The Bronx  
Museum of the Arts, Bronx, NY
- 1986 SIGGRAPH, Dallas, TX
- 1986 *The Computer as an Art Tool*,  
Hurlbutt Gallery,  
Greenwich, CT

**Glenn McQueen****Born**

1960 Toronto, Canada

**Education**

- 1984 Sheridan College, Oakville,  
Ontario, Canada
- 1986 B.S., New York Institute of  
Technology, New York, NY

**Selected Exhibitions**

- 1986 *Cleo Awards Opening*, Lincoln Center  
for the Performing Arts, New York, NY
- 1986 *Entertainment Tonight*,  
ABC-TV
- 1987 *Mill Valley Film Festival*,  
Mill Valley, CA

**Maureen Nappi****Born**

1951 Philadelphia, PA

**Education**

- 1976 B.F.A., New York University,  
New York, NY
- 1978 M.A., New York University,  
New York, NY

**Selected Exhibitions**

- 1984 *International Film and Television  
Festival of New York*, New York, NY
- 1985 *Digicon '85 Video Theatre*,  
International Computer Arts  
Society, Canada
- 1985 *Women's Work in Film and  
Video*, Catskill Center for  
Photography, Woodstock, NY
- 1986 SIGGRAPH, New York, NY
- 1986 *Video in the Boroughs: Techno Bop '86*,  
Anthology Film Archives,  
New York, NY
- 1987 *On Screen: A Celebration of  
Women in Film: Neo Video*,  
Northern California Women in Film  
and Television, San Francisco, CA

**Barbara Nessim****Born**

1939 New York, NY

**Education**

- 1960 B.F.A., Pratt Institute,  
Brooklyn, NY

**One-Person Exhibitions**

- 1974 The Benson Gallery,  
Bridgehampton, NY
- 1977 Hampshire College Gallery,  
Hampshire College, Amherst, MA
- 1987 Fine Arts Gallery, Spokane  
Falls Community College,  
Spokane, WA

**Group Exhibitions**

- 1985 SIGGRAPH, San Francisco, CA
- 1985 *The Artist and the Computer II*,  
Louisville Art Gallery, Louisville, KY
- 1986 *Artists in the Computer Age*, Owens  
Illinois Gallery, Owens-Illinois Art  
Center, Toledo, OH
- 1986 SIGGRAPH, Dallas, TX

**J. Michael O'Rourke****Born**

1947 Philadelphia, PA

**Education**

- 1969 B.A., Saint Joseph's University,  
Philadelphia, PA
- 1973 M.E., Harvard University,  
Cambridge, MA
- 1982 M.F.A., University of  
Pennsylvania, Philadelphia, PA

**Selected Exhibitions**

- 1985 *Emerging Expression: The  
Artist and The Computer*, The Bronx  
Museum of the Arts, Bronx, NY
- 1985 SIGGRAPH, San Francisco, CA
- 1985 SIGGRAPH, Boston, MA
- 1986 *Out of the Red Zone into the Book of  
Dreams*, Kennedy Center for the  
Performing Arts, Washington, DC
- 1986 SIGGRAPH, Detroit, MI

**John Pearson****Born**

1940 England

**Education**

- 1960 Harrogate School of Art, Yorkshire,  
England,
- 1963 Royal Academy Schools, London,  
England,
- 1964 Academie der Bildenden Kunst,  
Munich, Federal Republic of  
Germany
- 1966 M.F.A., Northern Illinois University,  
DeKalb, IL

**One-Person Exhibitions**

- 1983 Akron Art Museum, Akron, OH
- 1986 Belmont Gallery, Columbus, OH
- 1987 Toni Birkhead Gallery,  
Cincinnati, OH

**Group Exhibitions**

- 1985 SIGGRAPH, San Francisco, CA
- 1985 *Computer Assisted Art*, Ben  
Shahn Galleries, William Paterson

1986 College, Wayne, NJ  
SIGGRAPH, Dallas, TX

### Stefan Roloff

#### Born

1953 Berlin, Federal Republic of Germany

#### Education

Meisterschueler, Berlin Art Academy, Berlin, Federal Republic of Germany

#### One-Person Exhibitions

1983 Fashion Moda, Bronx, NY  
1984 Galerie Barbara Farber, Amsterdam, The Netherlands  
1985 Art Palace, New York, NY

#### Group Exhibitions

1985 *For Rich and Poor*, Limbo Gallery, New York, NY  
1986 *Three Painters*, Jayne Baum Gallery, New York, NY  
1986 *Man in the Media Age*, Kaufman Astoria Studios, Queens, N.Y.

### Elizabeth Rosenzweig

#### Born

1960 New York, NY

#### Education

1981 B.A., Goddard College, Plainfield, VT  
1985 M.S., Massachusetts Institute of Technology, Cambridge, MA

#### One-Person Exhibitions

1981 Goddard College Gallery, Goddard College, Plainfield, VT  
1981 Northern Lights Gallery, Burlington, VT

#### Group Exhibitions

1982 *Some People Say We Look Like Sisters*, Museum of Contemporary Art, School of the

Art Institute of Chicago, Chicago, IL  
1984 SIGGRAPH, Minneapolis, MN  
1985 *Computer Graphics and the Artist*, Anderson Gallery, Bridgewater State College, Bridgewater, MA  
1985 SIGGRAPH, San Francisco, CA  
1986 SIGGRAPH, Dallas, TX

### Matthew Schlanger

#### Born

1958 Brooklyn, NY

#### Education

1981 B.A. State University of New York at Binghamton, Binghamton, NY

#### Selected Exhibitions

1984 *Abstraction and Image Processing*, The Institute for Art and Urban Resources, P.S. 1, Long Island City, NY  
1984 *Video as a Canvas*, Pyramid Club, New York, NY  
1985 *Emerging Expression: The Artist and The Computer*, The Bronx Museum of the Arts, Bronx, NY  
1985 *The Artist and the Computer, Personal Visions in a New Age*, Leonard Davis Center for the Arts, City College of New York, New York, NY  
1985 *Experimental Television Center Anthology*, The Kitchen, New York, NY  
1986 *The Other New York*, National Video Festival, American Film Institute, Los Angeles, CA  
1986 *Views*, The New Museum of Contemporary Art, New York, NY

### Christa Schubert

#### Born

1934 Sumatra, Indonesia

#### Selected Exhibitions

1983 *Women in Computer Graphics: An Art for the Future*, Roanoke College,

Salem, VA  
1983 SIGGRAPH, Detroit, MI  
1983 *Computer Graphics As Art and Design*, California State University, Dominguez Hills, Carson, CA  
1984 *Art at Work*, Santa Ana College, Santa Ana, CA  
1986 *Art from the Computer*, California College of Arts and Crafts, Oakland, CA  
1987 *New Visions*, Los Angeles County Fair, Los Angeles, CA

### Ilene Goss Schuster

#### Born

1948 Detroit, MI

#### Education

1971 B.A., Wayne State University, Detroit, MI  
1974 M.F.A., Wayne State University, Detroit, MI

#### Selected Exhibitions

1986 *Star Wars*, Lasser Galleries, New York, NY  
1986 SIGGRAPH, Dallas, TX  
1986 *The Artist and the Computer III*, Louisville Art Gallery, Louisville, KY

### Patricia Search

#### Born

1948 Troy, NY

#### Education

1974 B.S., Skidmore College, Saratoga Springs, NY  
1979 M.A., Goddard College, Plainfield, VT

#### One-Person Exhibitions

1978 Art Resources Open to Women, Schenectady, NY  
1980 Williams College Art Museum, Williamstown, MA



1980 National Art Center, New York, NY

#### Group Exhibitions

- 1980 *Diverse Directions*, Cork Gallery, Lincoln Center for the Performing Arts, New York, NY  
 1985 SIGGRAPH, San Francisco, CA  
 1986 SIGGRAPH, Dallas, TX

#### Mimi Smith

##### Born

1942 Brookline, MA

##### Education

- 1963 B.F.A., Massachusetts College of Art, Boston, MA  
 1966 M.F.A., Rutgers University, Camden, NJ

#### One-Person Exhibitions

- 1980 The Art Center, Waco, TX  
 1980 A.I.R. Gallery, New York, NY  
 1983 Printed Matter, New York, NY

#### Group Exhibitions

- 1984 *The Center for Book Arts: The First Decade*, New York Public Library, New York, NY  
 1985 *Disinformation*, Alternative Museum, New York, NY  
 1986 *Book Works Invitational*, Erie Art Museum, Erie, PA

#### Teckon

#### Naoko Tosa

##### Born

1961 Fukuoka, Japan

##### Education

- 1982 Kyushu Junior College of Plastic Arts

#### Selected Exhibitions

- 1982 *Video Independent*, Osaka Contemporary Art Center,

- Osaka, Japan  
 1983 *New Generation Video Art*, Komai Gallery, Tokyo, Japan  
 1984 *Media Collection*, Gallery K, Tokyo, Japan  
 1986 SIGGRAPH, Dallas, TX  
 1986 *NCGA Computer Animation Competition*, National Computer Graphics Association, Anaheim, CA  
 1986 *New Video: Japan*, Museum of Modern Art, New York, NY

#### Frances Valesco

##### Born

1941 Los Angeles, CA

##### Education

- 1963 B.A., University of California at Los Angeles, Los Angeles, CA  
 1972 M.A., California State University, Long Beach, CA

#### Selected Exhibitions

- 1980 *The Light is Different in California*, Pratt Institute, Brooklyn, NY  
 1982 *New Print(making) Technologies*, World Print Council, San Francisco, CA  
 1985 *Prints USA*, Amerika Haus, Berlin, Federal Republic of Germany  
 1985 SIGGRAPH, San Francisco, CA  
 1986 *Techno Bliss/Techno Fear*, University of Santa Clara, Santa Clara, CA  
 1986 SIGGRAPH, Dallas, TX

#### Woody B. and Steina Vasulka

##### Born

- 1937 Woody B. Vasulka, Brno, Czechoslovakia  
 1940 Steina Vasulka, Iceland

##### Education

Woody B. Vasulka  
 The School of Industrial Engineering, Prague,

Czechoslovakia  
 Academy of Performing Arts, Prague, Czechoslovakia

- Steina Vasulka  
 1963 Music Conservatory, Prague, Czechoslovakia

#### Selected Two-Person Exhibitions

- 1971 Max's Kansas City Steak House, New York, NY  
 1971 WBAI Free Music Store, Judson Memorial Church, New York, NY  
 1971 The Kitchen, New York, NY  
 1975 Fundación Museo de Arte Contemporaneo de Caracas, Caracas, Venezuela

#### Selected Group Exhibitions

- 1971 *A Special Video Tape Show*, Whitney Museum of American Art, New York, NY  
 1976 *Matrix I: Electronic Materials*, Everson Museum of Art of Syracuse and Onondaga County, Syracuse, NY  
 1978 *Projects: Video XVIII*, The Museum of Modern Art, New York, NY  
 1984 *Fifth Festival International d'Art Video*, Locarno, Switzerland

#### Jane Veeder

##### Born

1944 Yuma, AZ

##### Education

- 1969 B.F.A., California College of Arts and Crafts, Oakland, CA  
 1977 M.F.A., The School of the Art Institute of Chicago, Chicago, IL

#### Selected Exhibitions

- 1982 *Video from Chicago*, Museum of Modern Art, New York, NY  
 1983 *San Francisco International Video Festival*, San Francisco, CA  
 1983 SIGGRAPH, Detroit, MI

- 1983 *The Artist and Computer*, Long Beach Museum of Art, Long Beach, CA
- 1984 *The Electronic Palette: A Selection of Chicago Video Art*, Walker Art Center, Minneapolis, MN

### Tanya Weinberger

#### Born

1939 San Francisco, CA

#### Education

Chouinard Art Institute, San Francisco, CA

#### Selected Exhibitions

- 1984 *Women in Film*, Rochester Institute of Technology, Rochester, NY
- 1985 *Animation Celebration*, Los Angeles Landmark Theatre Corporation, Los Angeles, CA
- 1985 *Tanya Weinberger and Skip Battaglia*, International Museum of Photography, George Eastman House, Rochester, NY
- 1985 *Chicago Children's Film Festival*, Chicago, IL
- 1986 SIGGRAPH, New York, NY

### Debra M. Weisblum

#### Born

1963 Brooklyn, NY

#### Education

- 1984 B.A., Brooklyn College, Brooklyn, NY
- 1987 M.F.A., University of Illinois at Chicago, Chicago, IL

#### Selected Exhibitions

- 1986 *Making Waves*, Evanston Art Center, Evanston, IL
- 1987 *The Interactive Image*, Museum of Science and Industry, Chicago, IL

### Mark Wilson

#### Born

1943 Cottage Grove, OR

#### Education

- 1965 B.A., Pomona College, Claremont, CA
- 1967 M.F.A., Yale University, New Haven, CT

#### One-Person Exhibitions

- 1973 University of Delaware, Newark, DE
- 1974 Hundred Acres, New York, NY
- 1975 Trumbull College, Yale University, New Haven, CT
- 1980 University of Delaware, Newark, DE

#### Group Exhibitions

- 1983 SIGGRAPH, Detroit, MI
- 1985 *Emerging Expression: The Artist and The Computer*, The Bronx Museum of the Arts, Bronx, NY
- 1985 *The Artist and the Computer II*, Louisville Art Gallery, Louisville, KY
- 1986 *The Computer as an Art Tool*, Hurlbutt Gallery, Greenwich, CT

### Ann-Sargent Wooster

#### Born

1946 Chicago, IL

#### Education

- 1968 B.A., Bard College, Annandale-on-Hudson, NY
- 1978 M.A., Hunter College, New York, NY
- 1975 Museum Studies Fellow, Whitney Museum of American Art Independent Study Program, NY

#### Selected Exhibitions

- 1984 *Revising Romance: New Feminist Video*, Institute of Contemporary Art, Boston, MA
- 1984 *Video Festival*, A.I.R. Gallery,

- New York, NY
- 1985 *Emerging Expression: The Artist and The Computer*, The Bronx Museum of the Arts, Bronx, NY
- 1985 *The Doll Show*, Hillwood Gallery, Long Island University, C.W.Post Campus, Brookville, NY
- 1986 *Video in the Boroughs: Techno Bop '86*, Anthology Film Archives, New York, NY
- 1986 *The Other New York*, National Video Festival, American Film Institute, Los Angeles, CA

### Edward Zajec

#### Born

Lublin Poland

#### Education

- 1966 B.F.A., Academy of Fine Arts, Lublin, Poland
- 1968 M.F.A., Ohio University, Athens, OH

#### One-Person Exhibitions

- 1979 Galleria Nuovo Spazio, Venice, Italy
- 1981 Jozef Stefan Institut, Ljubljana, Yugoslavia
- 1984 TK Gallery, Trieste, Italy

#### Group Exhibitions

- 1981 SIGGRAPH, Dallas, TX
- 1983 *Digicon '83, International Conference of Digital Arts*, University of British Columbia, Vancouver, British Columbia, Canada
- 1984 *The Computer and its Influence on Art and Design*, Sheldon Memorial Gallery, University of Nebraska, Lincoln, NB
- 1984 *Video Culture*, Toronto, Ontario, Canada
- 1985 *The Artist and the Computer II*, Louisville Art Gallery, Louisville, KY

**Norman Zammitt****Born**

1931 Toronto, Ontario, Canada

**Education**

1957 A.A., Pasadena City College,  
Pasadena, CA  
1961 M.F.A., Otis Art Institute of  
Parsons School of Design, Los  
Angeles, CA

**One-Person Exhibitions**

1977 Los Angeles County Museum of  
Art, Los Angeles, CA  
1978 Corcoran Gallery of Art,  
Washington, DC  
1984 Flow-Ace Gallery,  
Los Angeles, CA

**Group Exhibitions**

1981 *Los Angeles Prints: 1883-1980*, Los  
Angeles County Museum of Art,  
Los Angeles, CA  
1984 *Future World Expo*, Moscone  
Convention Center, San  
Francisco, CA  
1986 *Contrasts*, Los Angeles County  
Museum of Art, Los Angeles, CA  
1987 *The Spiritual in Art: Abstract  
Painting, 1890-1985*, Los Angeles  
County Museum of Art,  
Los Angeles, CA

**Eileen Zegar****Born**

1951 Los Angeles, CA

**Education**

1976 B.A., San Francisco State  
University, San Francisco, CA  
1979 M.F.A., Mount Royal Graduate  
School of Painting, Maryland  
Institute College of Art,  
Baltimore, MD

**Selected Exhibitions**

1980 *22nd Area Exhibition: Works on  
Paper*, Corcoran Gallery of Art,  
Washington, DC

1980 *Aquavision*, Small Images,  
Washington, DC  
1980 *Drawings: A Two Person Show*,  
School 33 Gallery, Baltimore, MD  
1981 *Options: Washington*,  
Washington Project for the  
Arts, Washington, DC  
1985 *10th Anniversary: Mount Royal*,  
Decker and Meyerhoff Galleries,  
Maryland Institute College of Art,  
Baltimore, MD  
1986 *Twang, Bang, Boom*,  
(Performance in collaboration with  
T. Michael), David Alexander  
Studio, Hollywood, CA

**Neil Zusman****Born**

1953 Brooklyn, NY

**Education**

1977 B.A., State University of New York  
at Binghamton, Binghamton, N.Y.

**Selected Exhibitions**

1982 *Animal Magnetism*, Institute for  
Art and Urban Resources, P.S. 1,  
Long Island City, NY  
1983 *Electronic Image Process II*,  
The Kitchen, New York, NY  
1986 *Small Computers in the Arts*,  
Philadelphia, PA  
1986 *The Other New York*, National  
Video Festival, American Film  
Institute, Los Angeles, CA  
1987 *Techno Bop '87*, The Kitchen,  
New York, NY

## Glossary

**Analog** - A recording system in which the electrical signal fluctuates exactly like the original stimulus, over the entire range.

**Basic** - A computer language and acronym for Beginners All-purpose Symbolic Instruction Code.

**Colorization** - The creation of color pattern or color areas by means of a color generator and without a color camera.

**Cursor** - A symbol on a computer terminal which shows where the next piece of information will appear on the screen.

**Digital** - The antonym of **analog**. A recording system that translates original sound or visual stimuli into many computer-type, on/off pulses.

**Encoding** - The process of translating data into a particular computer language.

**Fractal** - A digital simulation of an image, usually a landscape.

**Frame Storage** - The function by which a system has a memory large enough to store and read out at least one complete video frame.

**Gen-lock** - A function which locks one electronic signal with a signal from another source, thereby allowing a videotape source to be intermixed with one or more studio cameras.

**Icon** - A graphic representation of an object, concept, or message. On personal computers, icons often represent software programs, tools, documents, and files.

**Ray-tracing** - The mathematical modeling and manipulation of three-dimensional forms on a computer screen.

**ScanMural** A computer-controlled spray-paint process that produces images from transparencies.

**SIGGRAPH** - An acronym that stands for Special Interest Group in Computer Graphics, a professional association sponsored by the Association for Computing Machinery. SIGGRAPH organizes a computer graphics art show for their annual convention which is usually held in major cities across the United States. From the convention exhibition, traveling exhibitions are organized.

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