NOTES TOWARD A HISTORY OF IMAGE-PROCESSED VIDEO

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Ed. "a note: This is the second in a series of articles on image-processing." for The Art Review examined the contributions of Eric Siegel, Stephen Beck, Steve Rutt, Dan Sandin, and Bill and Louise Etra to the development of electronic imaging devices [see Alminuma, Vol. 11, Nos. 1 & 2 (Summer 1983); pp. 35-38]. Future articles will discuss the work of Ralph Hooding and Sherry Miller at the Experimental Television Center, Nam June Paik, Shalom Gorewitz, Barbara Buchner, Sara Hornbacher, Peer Bode, and others. The project is funded by a grant from the New York State Council on the Arts Media Program.

Despite the fact that many video artists whose work is categorized as image-processed reject this term, it can be useful in describing work by people who not only use similar equipment but share an attitude which treats the video signal as a data medium. Beyond the classifications, however, the designation can be misleading since, as a genre, "image-processed" conflates any and all tapes which contain manipulated and/or synthesized imagery. This acknowledges obvious technical similarities but does not account for the variety of approaches which produce works that can be more precisely interpreted. Of course, one interpretation doesn't rule out another, and an attempt must be made to get beyond the all too familiar responses to this work—that is, either total rejection or total embrace. The purpose of this essay, I believe, is to find the heretofore uncharted territory. The first is to identify—without becoming dogmatic—some of the different approaches, some of the social and artistic contingencies, and how these are manifested in the work. The second—but by no means secondary—goal is to contribute to a broader history of the medium which emphasizes the parallel and overlapping activities of artists. Probably the most common way image-processed work has been described is as an exploration of the basic property of video—the electronic signal. There are many examples of this fundamentally formalist characterization which, I think, provides a way to lend modernist credentials to an art form that has had a difficult time gaining acceptance—critical attention, funding, marketability—by traditional art institutions.

More recently, Sherry Miller, assistant director of the Experimental Television Center, wrote in Exposure, "The human nervous system is trained to respond to the electronic net, for instance, the visual system which actually defines the resulting image and video." Electric image processing uses art-making material those properties inherent in the medium of video. Artists work at a fundamental level with various parameters of the electronic signal, for example, frequency, amplitude, or phase, which actually define the resulting image and video.

Yet another recent example is the catalogue introduction to "The Electronic Gallery," an exhibition that included tapes by a number of people who use the Experimental Television Center. In it Maureen Tun writes, "The Center explores video as an artistic medium. To figure out, to get form, to embody, to display the various properties that a video system can possess." Such generalizations pose a number of problems. It is highly questionable whether synthesized or manipulated video can be categorized in the same way as image-processed work. The use of "image-processed" perhaps better defines the Vasulkas' "inherent properties." Couldn't one easily argue that video is instantaneously and potently for interaction? In other words, more important, is there another point Tun makes? Ultimately, though, the works gain their communicative impact in reference to other contexts.

These quotes refer to any and all kinds of image-processed work, and, I believe, to all the prominent artists associated with this type of video, artists who have been involved in experimenting with the medium in some way. It is an attempt to extend their work within the contexts of art, film, and film communities. In November 1985 Village Voice film critic Jonas Mekas proclaimed in his weekly column, "The medium of cinema is breaking out and taking over and is going blindly by its own means." In 1986, Mike projected, "Suddenly, the intermedia Andrea is all over town." Light shows, slide shows, multiple film projections, light-motion art, sensoria—these were the activities of people like Jackass Cassen, Elaine Simmons, Just Yalkut, Aldo Tambellini, Stan VanDerBeek, Ed Emshwilier, Gerd Stern, Nam June Paik, and many others. Many, though certainly not all, of these events were inspired by Marshall McLuhan's influential media theories. Because of the widespread impact and popularization of McLuhan's writing, it may be helpful to briefly review his arguments.

McLuhan begins with the assumption that modern human experience is characterized by the simultaneous reception of vast amounts of information in the form of sense stimuli: sight, smell, hearing, taste, and touch. Because the attempt to communicate and process this vastened experience is subject to distortion, some method of communication is better than others, according to McLuhan, a medium which "extends one single sense in high definition."—such as a photograph—is a hot medium, whereas a medium which provides only minimal extension of a sense—such as print—is cool. In other words, cool media demand a high level of participation, or completion, by the receiving audience, while hot media do not.

In McLuhan's formulation, the electronic communications "explosion" of the 1960's created a new form of perception which makes these stimuli directly apprehensible through the "hot" electromagnetic field, once the medium as "extensions of man," television and radio act as cybernetic extensions of the human nervous system. As McLuhan wrote in 1964, "Today, after more than a century of electric technology, we have extended our central nervous system itself in a global embrace, abolishing both space and time as far as our planet is concerned. We approach the final phase of the extensions of man—"the technologi..."
Thus, McLuhan's "global village," a harmonious world "tribe" linked via a network of instantaneous communication, would evolve. Jonathan Miller has pointed out that McLuhan's overly optimistic vision could only have been achieved by "stressing the immediate mental effect of the various media at the expense of neglecting the messages they actually convey." This emphasis on the effect of the medium itself—regardless of its content—is the basis for the famous dictum, "The medium is the message." This aphorism fits quite readily with formalist art discourse: identifying those qualities specific to video as an art medium not only coincided with McLuhan's ideas but Clement Greenberg's formalism.

McLuhan's theory has since been discarded by some scholars because his utopianism completely contradicts the fact that electronic media have been used as instruments of social control. Moreover, as Raymond Williams has shown, this analysis represents a technologically deterministic approach to history, which posits technology as a force in itself—responsible for changes in society and the human condition—rather than something developed with specific purposes in mind. In Television: Technology and Cultural Form Williams counters McLuhan: "All media operations are in effect desocialised: they are simply physical events in an abstracted sensorium, and are distinguishable only by their variable sense-ratios (emphasis added)."

Still, as I said, many artists were creating intermedia sense environments, openly embracing McLuhan's ideas. These events—as well as others less explicitly derived from McLuhan—were commonly known as "expanded cinema" (the term was later used as the title for Gene Youngblood's futuristic survey of such work).

While the Vasulkas read Mekas's column regularly and were peripheral aware of underground filmmakers, they attended very few of these events in the first years they were in New York. Steina continued studying violoncello, while Woody started working on commercial and industrial films and exhibits in 1967. In 1969 he started using video. His employer, Harvey Lloyd, was using closed-circuit, multiple-monitor video displays as well as multi-screen projections and this structure eventually became the model for much of the Vasulkas' early work.

For Woody, video provided an alternative to film which he felt was an exhausted medium. In 1978 he recalled, "I was educated in film, which I understood as an extension of narrativity into space. So at that time, I was very concerned with literary forms, with the narrative possibilities in cinematic ways, which I linked directly to the economic structure of existing productions—studios, laboratories, equipment. But then, after I had worked in film productions in New York City, did I achieve any independence, or manage to personalize the process of image-making, and that came about as a result of working with electronic equipment." Beyond the compromises entailed in working in the film industry and the limitations of conventional cinematic narrativity, Woody also had an initial fascination with what might be called the phenomenology of video: "When I first saw video feedback, I knew I had seen the cave fire. It had nothing to do with anything, just a perpetuation of some kind of energy."

Like many other early video artists, Steina's involvement was inspired by Howard Wise's exhibition, "TV as a Creative Medium," held in the spring of 1969. "I went in there and saw Einstein [a tape by Eric Siegel utilizing the video colorizer he designed and built], blasting out, and it quite blew my mind." Soon, both the Vasulkas were using Lloyd's equipment after work, and eventually Woody began bringing it home. At that point, they realized that the only way they could really experiment was by living with the equipment. "What started happening," Steina recalls, "was that every day Woody would come from work at five o'clock, and I would have another piece for him. He got so jealous because in the beginning he was just coming home from work one day and said, 'I'm quitting!' Using some borrowed equipment and some that they bought, in early 1970 the Vasulkas began to work more "systematically," "making feedback loops and using audio inputs to generate and alter the video signal inside black and white monitors."

Although many of these experiments were not original since others had done them before, the excitement of that time was generated by the sense of being pioneers. There was a camaraderie among people who were making discoveries about the potential of video—as an electronic phenomenon and as a tool for social change. As Steina describes this animus, our discovery was a discovery because we discovered it. We didn't know that those people had discovered it before us. It was just the feedback pointing the camera at the TV set and seeing feedback was great fun even if it was inverted and over and over again. At least in 1972, people were inventing feedback, thinking they had just caught the fire of the gods.

Part of the excitement, too, had to do with the informality of exchanges among people. Tapes were shown in lofts or clubs, and information spread through word of mouth or sometimes via small ads in the Village Voice or the East Village Other. But, says Steina, "It's different now, it was a secret then. People would come and say, 'If you go to that loft there, there's a lot of video stuff.'" And Woody summarized the attitude in a 1972 New York Times article: "What is special about video art at this time is that it isn't trapped in rigid rules. There are not yet any cliches, and the artists haven't had time to develop the maniacal egos one finds in the other arts. All the video artists are like one big family and thinking about video's big future." The video "family" was not homogeneous, though. The Vasulkas were more interested in art and the counterculture...
Every aspect of video activity, then, whether it was electronic or not, evolved into a full-time alternative space. Like many organizations founded in the late '60s and early'70s, the goal was to impose an organizing structure that was derived not through external inputs—known as voltage control—or by using their hands to move a control knob until an image could be seen. Instead, they took a modular approach, but they wanted to create an open and flexible situation and, importantly, not to preconceive an image separately. They wanted to make a conscious model of what was going on, not just react to it. But it is more complex, because we sometimes design the tools and do conceptual work as well.

The Vasulkas often speak of their work as a dialogue with the tools they use. In fact, tools are so central to their work that they make many of the tools they use. For the Vasulkas, it was difficult to think of their space as an "establishment." They wanted to become administrators of an electronic art. The original idea behind what eventually became simply the Kitchen was to establish an electronic lab in which artists could experiment with sound and images. Because electronic sound and electronic image operate on many of the same principles, the Vasulkas wanted to explore this relationship. In the fall of 1973, the Vasulkas moved to Buffalo, N.Y., to teach a video workshop at the Center for Media Studies. In 1974 Woody had become a faculty member at the State University of New York at Buffalo, and they also began to release their own tapes. They remained in Buffalo until 1979. In the fall of 1973, they had already begun their investigations into the phenomenology of video, but they probably couldn't have had more a more intellectually compatible environment. In the same department were artists such as John L. Phillips, and Tony Conrad—all filmmakers who were, in different ways, dealing with similar material. What's more, the equipment was usually more sophisticated. The Vasulkas were always interested in certain decadent aspects of our culture, and they had art backgrounds. This was their anti-mainstream stance, the image that they wanted to make interesting to viewers. But for producing special effects I have always been interested in the relationship with creative people outside industry, but who have the same purpose and desire to make art.
While the Vasulkas initially focused on two basic areas—
horizontal drift and the audio-visual relationship—they became aware of the variety of effects by commissioning various people to build specialized video equipment. As Steina recalls,

in the spring of 1970, which was the first year we were working, we met Eric Siegel and we had a regular meeting with him every week. All the equipment we had had gotten, and we got to use his col-
only, and he helped Woody to build one. He made the boards, and then Woody wired everything together, which was the first wiring ex-
perience that Woody got into video. As soon as we got the first money from the State Arts Council (NYSCA), we set a little aside for our development, and our first person became George Brown.

In addition to the Horizontal Drift Variable Clock, Brown constructed a swiveling in 1971. He also made a cascading or multi-key in 1973. Under various keyers, what key two im-
ages—one over another—the multi-key could key up to six images. This allowed images to be manipulated to create foreground-background relationships. In 1974 Brown also made a programmer, a digital device which could store and replay a sequence of operations such as a switching or key-
ning order.

Between 1971 and 1974 the Vasulkas made numerous tapes utilizing these devices in increasingly complex combina-
tions. Black Sunrise (1971), described by the Vasulkas as a “performance of energies organized into electronic images and sounds,” is a continuum of constantly permutating abstract images which variously resemble a landscape or an aurora. Elements (1971) consists of variations on video feed-
back loops; frequencies, from sounds, from inaudible pitches and their vertical deflection system—or the magnetic force that “pulls” the image vertically—so that the brightest portions of an image stand out. As Johanna Gill described the effect, “one is seeing is a topographical map of the brightness of an electronic image. The input signal feeds the horizontal waveform, and Steina, all transform camera images—landscapes, street scenes, fish-eye—into topographic renderings. These tapes and films often form a surreal landscape, a movement of light detectable only with the pinhole effect, as ironic and stupid as it sounds to call it that.”

The idea that video images were nothing more than elec-
tronomagnetic energy constructed in time was central for Woody, and he made numerous tapes and films from 1970 to 1973 which specifically address: Many of these used audio and/or visual noise as the image source. One of the clearest illustra-
tions of what he called “time-energy objects” is found in The Matter (1974). In it a generated dot pattern is displayed on the raster. The three primary waveforms—sine, square, and triangle—are fed into the Rutt/Erta and used to shape the raster display so that the dot pattern assumes the shape of each waveform. Woody illustrated these kinds of changes more systematically in a set of grid-dial displays consisting of still photographs that depict the various states of the raster when controlled by the primary waveforms in conjunction with another pattern. In this way the three waveforms were designed as successive effects, other tapes and films apply these principles to camera-generated images because the Rutt/Erta processes the signal in such a way that light energy—or brightness—can be converted to magnetic force. The illusion of three-dimensional reality is created by the system observing her and repositioning herself in the space in response. In the installations Alvision No. 1 (1978) and No. 2 (1978-79), set up respectively at the Albright-Knox Gallery in Buffalo and at the Kitchen, these contraptions become actual devices. The number of the video image. Usually it is not so much the investigation of video’s inherent properties as a formal end in itself, rather, it was more phenomenological, directed at challeng-
ing culturally determined notions of what constitutes reality. Meanwhile, Steina took a different, though related, tack in Machine Vision, a series of tapes and installations begun in 1975. By utilizing a variety of mechanized modes of camera control—originally built by Woody for film work—Steina began to set up apparatuses designed to disassociate the camera from a human point of view.

Habitually, by looking, we select something, subjectively “zooming,” and “focusing” the space around us. I wanted to create a space that can see the whole space all the time. And it too derived from my understanding of collage, which is not the invention of the collage or collage space. It was a challenge to me to create a space that would not deal with the deconstructions of human vision.

Signifying Nothing (1975), Sound and Fury (1975), and Switch/ Monitor Drift (1976) are all demonstrations of Steina interacting with studio set-ups in which two motorized camera monitors control not only the surrounding space but the movement of the other camera. The most complex of these is Switch/ Monitor Drift, which consists of 13 scenes that vari-
ably develop around the movement of a machine, with added aspects affected by seeing, keying, switching, horizontal drift, and scan processing. The result is not merely technolog-
ically impressive, but cerebral: the dislocation of the picture plane forces the viewer to make sense of the surrounding space, the distancing of self from self. The machine allows the observer to see and think of an entire system of the world and see the world as a series of processes and the way humans interact with those processes.

Two cameras are mounted on the ends of a slowly revolving axis with a perfectly spherical mirror at the center of the axes. On the monitors, viewers see an artificially created 360°-degree image. While the viewers are part of the “real” space, they can at the same time see them-
selves in a perfectly spherical mirror at the center of the axes. The theory that Woody first articulated in the mid-70’s and has continually refined reestablishes not only what we generally call “reality,” but what we generally call “reality.” Since we look at reality through our eyes, the reality has total dependence on percep-
tion, on how images are formed in the eye. In other words, because the camera lens has come to represent an exten-
sion of human vision, it has been equated with a truthful ren-
forcement of reality.

According to Woody, electronically-generated, non-cam-
era images—based on whether the lens or the eye—indicate different possibilities for a new visual order that would suggest the traditional lens-bound mode of visual organization which has come to be accepted as most “real.” He described his goal in 1975. By utilizing a variety of mechanized modes of camera control—originally built by Woody for film work—Steina began to set up apparatuses designed to disassociate the camera from a human point of view. Habitually, by looking, we select something, subjectively “zooming,” and “focusing” the space around us. I wanted to create a space that can see the whole space all the time. And it too derived from my understanding of collage, which is not the invention of the collage or collage space. It was a challenge to me to create a space that would not deal with the deconstructions of human vision.

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I can at least unleash some attack against the tradition of imaging, which I see mostly as camera-obscura-bound, or as phony orga-nicist principles. This tradition has shaped our visual perception, not only through the camera obscura, but it’s been reinforced, espe-
cially through paintings and through vision. It’s a deceptiveness of the pinhole effect, as ironic and stupid as it sounds to call it that.

Woody’s work with the Rutt/Erta, which he characterized as the “irrelevant descent into the analysis of smaller and smaller time sequences,” was a first step toward developing a new code. The code was derived from nature, in that the de-
ses he was using—in particular, the Rutt/Erta—were capa-
bles of selecting and replaying a waveform, a frequency, by connecting the different modes of mechanized perfor-
tomagnetic forces that occur in nature. These become per-
ceptible as sounds and images only when artificially proces-
sed by oscillator s, and displayed on oscilloscopes or video monitors, or processed through devices like the scan proces-
sor. Woody opened up the frontiers of vision by constantly changing the signal—audio, video, brightness—are interpo-
lated as voltage changes that vary continually. An image or

The Vasulkas' efforts in the late '70s were highlighted by Starna's count: Woody soldered over 20,000 images. Because of the enormous time and energy required, a more complex system took the Digital Image Articulator or Digital Artifacts. All of the Vasulkas' imaging activities were directed toward building the machine. The tape Cantaloupe, completed in 1981, is a demonstration of the process. In 1977 and 1978, the Vasulkas made several tapes that were titled Update, which show early examples of their work with the Digital Image Articulator.

This system can take two video inputs, digitize these, and then perform a series of operations on those two images based on logic functions derived from the Arithmetic Logic Unit (ALU) or digital computer components. Depending on which logic function is operating, the numerical codes-and hence the images—are combined in different, but absolutely predictable ways. Such combinations revealed the system's inner structure to the Vasulkas, and also constituted what Woody has called a syntax.

What was surprising to me was to find that the table of logic functions can be interpreted as a table of syntax—syntactical relationships which are not normally thought of as being related to abstract logic functions. Because the logic functions are abstract, they can be applied to anything. That means they become a unified language, outside of any one discipline.24

To illustrate his ideas, Woody organized a set of grids—just as he had in 1975 with analog images—which represent the precise visual manifestations of this syntactic structure. In video terms, however, an important property of the images was its capacity to perform and other operations in real time. This was substantial, since a video signal could now be digitally processed as it passed through the image—practically instantaneously—contrasted to the kind of computer imaging in which a program is entered and one must wait minutes or hours, depending on the program's complexity, for the computer to perform the operation.

Artefacts (1980) is a sort of demonstration tape that uses the logic of the computer to combine real-time, digitized camera-generated images and texture so that effects like keying, removing, and mixing are made possible. Woody described the tape as a "collection of images invented by basic algorithmic procedures, to verify the functional operations of the newly created tool." Artefacts revealed the Vasulkas' analysis of their work as dialogue with a tool. In the tape, Woody explains, "by artifacts, I mean that I have to share the space without executing anything."

Starna also utilized the digital system, but within much less theoretical constraints. In several tapes, among them Computations, Toews and Ii's There Are No Words, Woody's project of using a linguistic model for imaging is hardly novel; rather, much of his thinking proceeds from his background. A number of film semioticians have examined the Christian Metz's claim that "the language and functioning of the main signifying units used in the film mess- age are different and distinct from those of a written text."25 Such combinations revealed the system's inner structure to the Vasulkas, and also constituted what Woody has called a syntax.

"The cinema was not a specific 'language' from the actors' speeches. For instance, in one segment, the narrator describes the intense feeling of expectation that a follower of Paganini experienced when he thought he would get an opportunity to hear the violinist play. The pitch of the processed voice rises and falls as he tells of his anticipation and eventual disappointment.

The video, too, is carefully conceived. In one scene Paganini hands Berlioz an envelope containing a commission for a commission is completely mystifying and frustrating. At the same time, the work is so carefully structured and the texts so compelling that upon repeated viewing the viewer can discern various themes underlying the story. The pitch of the processed voice rises and falls as he tells of his anticipation and eventual disappointment.

Without embarking on a textual analysis of The Commission, I would like to suggest a few of the ways that Woody—like his son James—has used electronic imaging to advance his work. The Commission is composed of images taken from a series of film segments: "The commission is completely mystifying and frustrating. At the same time, the work is so carefully structured and the texts so compelling that upon repeated viewing the viewer can discern various themes underlying the story." The pitch of the processed voice rises and falls as he tells of his anticipation and eventual disappointment.

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create a death chamber space—very effectively—in the scene of Paganini's embalming; the results also provides a visual counterpart to Paganini's false gesture of giving; however, the stiff jerky movement which device—first used in Steina's Saund and Fury—emphasizes musical scare, acting as an intermediary for an anonymous dichotomy within modernist art discourse—that is, to make a with imaging devices, my first impulse was to invoke an old problem of characterization, plot, and even representational devices may be used as narrativized devices in the future—In the next article, I will discuss other art— they have done, they have also suggested how some of the does not hold—in spite of the formalist implications of what l'll shed these two points, one could chart an axis along which framework, the first approach would be represented in the first generation of video artists by the Vasulkas, while the latter would descend from Naum Jan Paik. Having established these two points, one could chart an axis along which other artists could be placed. However, as closer scrutiny of the Vasulkas' work clearly demonstrates, such a dichotomy does not hold. In spite of the formalist implications of what have also suggested how some of the imaging practices might be used to challenge representational conventions. In the next article, I will discuss other artists' work in relation to the flip side of the modernist coin—expressionism.

In trying to distinguish between various videomakers' work with imaging devices, my first impulse was to invoke an old dichotomy within modernist art discourse—that is, to make a distinction between two basic approaches that can be identified as formalist and expressionist. According to this framework, the first approach would be represented in the first generation of video artists by the Vasulkas, while the latter would descend from Naum Jan Paik. Having established these two points, one could chart an axis along which other artists could be placed. However, as closer scrutiny of the Vasulkas' work clearly demonstrates, such a dichotomy does not hold. In spite of the formalist implications of what have also suggested how some of the imaging practices might be used to challenge representational conventions. In the next article, I will discuss other artists' work in relation to the flip side of the modernist coin—expressionism.

NOTES
4. Ibid., p. 18.
5. Interview with the author, June 22, 1983.
7. Except where otherwise noted, all quotes from Woody Vasulka are from interviews with the author, March 18, 1983.
11. Ibid., p. 19.
14. See, for example, Mekas's description of a piece by Gert Stern with Jack Yank and Brian Peterson at the Filmmakers Cinematheque, Movie Journal, p. 215; also his description of a multi-monitor display at Global Village, Movie Journal, p. 380.
16. Ibid., p. 25.
17. Except where otherwise noted, all quotes from Steina Vasulka are from interviews with the author, February 15, 1983; March 19, 1983, and Aug. 3, 1983.
19. In 1969, a year that was covered by $8,000 the Vasulkas received from the New York State Council on the Arts. Because by law NYSCA cannot fund artists directly, all projects are funded through non-profit organizations. According to NYSCA records, the Vasulkas—as a part of the group Perception—were funded in 1971-72 through Howard Wise and stanza (later called Electronic Arts Intermedia.) Besides the Vasulkas, Perception originally included Eric Siegel and Vince Novak. The following year, still under the Intermedia umbrella, they formed Vasulka Video as a way of getting funding for their tool development. Perception expanded to include Juan Downey, Frank Gillette, Andy Mann, Jim McDermott, and Sherry Miller.
20. Sherry, op. cit.
21. Among the new music composers and performers were Laurie Spiegel, Jacob Druckman, Emmanuel Guittar, Phil Niblock, Frederic Rzewiak, Gordon Mumma, Alan Lucier, Tom Johnson, Charles Madden, and Charles Dodge.

SELECTED VIDEOGRAPHY
Steina and Woody Vasulka

Sketches (1970) 27 min., black and white.
Calligrams (1970) 12 min., black and white.
Sixmachine (1970) 5 min., black and white.
Tissue (1970) 6 min., black and white.
Jackie Curtis's First Television Special (1970) 45 min., black and white.
Decay #2 (1970) 7 min., color.
Decay #7 (1970) 7 min., color.
Evolution (1970) 10 min., black and white.
Disc (1971) 10 min., black and white.
Shapes (1971) 13 min., black and white.
Black Sunrise (1971) 21 min., color.
Keysnow (1971) 12 min., color.
Elementz (1971) 9 min., color.
25-30-345 (1971) 15 min., black and white.
Distant Activities (1972) 6 min., color.
Spaces 2 (1972) 15 min., black and white.
Soundprints (1972) 30 min., endless loops, color.
Home (1973) 17 min., color.
Golden Voyage (1973) 29 min., color.

Vocabulary (1973) 6 min., color.
Solo for 3 (1974) 5 min., color.
Heraldic View (1974) 5 min., color.
Soundscapes (1975) 4 min., color.
Signifying Nothing (1975) 15 min., black and white.
Update (1978) 30 min., color.
In Search of the Castle (1981) 12 min., color.

Steina Vasulka

From Cheektockwards to Tonawanda (1975) 36 min., color.
Signifying Nothing (1975) 15 min., black and white.
Sound and Fury (1975) 15 min., black and white.
Switch! Monitor! Drift! (1976) 50 min., black and white.
Snowed Tapes (1977) 27 min., black and white.
Land of Timbuctoe (1976) 15 min., color.
Flux (1977) 15 min., color.
Violin Power (1978) 10 min., color.

In addition to the Vasulkas and Chatham, other "voices in the kitchen"—as they were initially called—were David Deavoidah, a video artist who, with George Chulak, organized a computer video festival; Jonathan Bieltz, a video artist who organized a video festival with Steina in July 1972; Michael Tschudin, rock musician, composer, and founder of the Midnight Opera Company, a rock band that played on weekends. All involved in music programming were Jim Burton and Bob Steams, who became directors of The Kitchen in the summer of 1973.

24. Hagen, p. 20.
27. Among the influence of this period is found in a NYSCA grant proposal for Perception after the Vasulka formed Vasulka Video. Developing the group's multi-channel projects, they said, "through the application of cybernetic (or) principles, multi-channel systems demonstrate in microcosm, the future posture of global communication."
30. Gill, p. 49.
31. Ibid., p. 50.
32. Hagen, p. 49.
34. From program notes for exhibition at The Kitchen, 1978-79.
36. At the Experimental Television Center, then in Binghamton, N.Y., N. Ralph Howard and Sherry Miller began to discuss the unavailability with MacArthur and Wright in 1975. The original plan was for the Center as the Vasulkas to get the same computer and develop compatible software. This proved to be less realistic than originally thought, and the Center opted for a less software-dependent system.
37. Hagen, p. 21.
39. Ibid., p. 106.
40. Hagen, p. 21.