

# THE VASULKAS

WOODY VASULKA  
INSTALLATIONS

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## Woody Vasulka: Biographical notes

Woody Vasulka was born in Brno, Czechoslovakia where he studied metal technologies and hydraulic mechanics at the School of Industrial Engineering. Later, at the Academy of Performing Arts (Faculty of Film and Television) in Prague, he produced and directed several short films. He emigrated to the United States in 1965, living in New York City, where he worked as a freelance film editor and experimented with electronic sounds and stroboscopic lights. With his wife Steina, he founded The Kitchen in New York City, recognized as one of the foremost producing and presenting organizations in the world of experimental media spaces. Woody has participated in major video shows worldwide, published articles, composed music, lectured and taught internationally. In 1974, he became a faculty member of the Center for Media Study at State University of New York, Buffalo. While living there he began investigations into video and the computer.

He is a Guggenheim Fellow, and the recipient of numerous other distinctions including grants from the National Endowment for the Arts, the American Film Institute and the Siemens Media Art Prize.

Since his move to Santa Fe, New Mexico in 1980, he has produced three major video works: Artifacts, The Commission (an operatic work based on the legend of Paganini and Hector Berlioz), and Art of Memory (a series of "songs" thematically related to 20th century political events).

His first multimedia installation The Theater of Hybrid Automata, a result of his investigations into "digital space" has been exhibited in Los Angeles, Italy, France, Czech Republic, Austria, Germany and Holland.

His most recent installation is a largely computer-assisted work, entitled Brotherhood.

A laserdisc interactive book he co-edited titled Eigenwelt der Apparatewelt featuring the "pioneers of electronic art" was produced by Ars Electronica for an exhibit with the same name, curated by the Vasulkas in Linz, Austria, 1992.

As a Guest Professor at the Faculty of Art of the Polytechnic Institut (VUT) in Brno, Czech Republic, He heads an experimental program at the Atelier of Videoart and Multimedia.

The year 1996 will see a major retrospective of the Vasulkas' works at the San Francisco Museum of Modern Art, with the publication of an expanded catalogue (book and CD ROM). September 1993.

Woody Vasulka:

## Selected Recent Installations: 1989-1994

Artifacts, "Steirischer Herbst," group show, Graz, Austria, 1989

Artifacts, Schatten Projectionen, group show, Oberhausen, Germany, 1992

Theater of Hybrid Automata, Ars Electronica, group show, Linz, Austria, 1990

Theater of Hybrid Automata, with David Dunn, "Imagine Elettronica," Ferrara, Italy, 1991

Theater of Hybrid Automata, "Artifices II," group show, St. Denis, Paris, France, 1992

Theater of Hybrid Automata, INVEX93, Brno, Czech Republic

Brotherhood, Table III and Theater of Hybrid Automata, Bonn Germany, 1994

Brotherhood, Table III, group show, Ars Electronica, Linz Austria, 1994

Brotherhood, Table III, LACE, with Steina, Los Angeles, Ca, 1994

Theater of Hybrid Automata, group show, Manes Gallery, Prague, Czech Republic, 1994

Brotherhood, Table III, group show, INVEX94, Brno, Moravska Galerie, Czech Republic

Brotherhood, Table III, and Theater of Hybrid Automata, group show, V-2 Festival, Rotterdam, Holland 1994

Participation at group show of video installations titled "V pohybu", at Manes Galerie, Prague, by Theater of Hybrid Automata, 1994

## Video Tape screenings:

Art of Memory, group show, Museum of Contemporary Art, Helsinki, Finland, 1992

Art of Memory, with Steina, Denver Art Museum, Denver, CO, 1992

Participation at Cesky Obraz Elektronicky, group show, Manes Galerie, Prague, 1994, through a selection of tapes and by a lecture

Included in the Group show by tape and Catalog, Klatovy-Klenova Galerie, Project Seda Cihla 66, 1994

Retrospective show of The Vasulkas at Locarno Video Festival, Switzerland, 1994

Articles:Digital Space

Catalog, Ars Electronica, Linz Austria, 1990

Report on Noncentric Space

for a book titled Der Entfesselte Blick, Bern,  
Switzerland, 1993

The strategy of Technodeterminism

Eikon Magazine, Vienna 1993

of mostly cliched and traditional image making while the innovative artist unsuccessfully plots ways to influence the design of its digital code.

It is this shift from primary to secondary levels of artistic participation in the design of media tools that now concerns Woody Vasulka. Is aesthetic research of the kind that occupied him for over two decades still possible or even relevant? In many ways the current installations are an attempt to address this question and more specifically to explore it in the context of both the contemporary and recent historical arenas of the machine as cultural code. In his earlier work Woody could explore the electronic reconstruction of archaic perception with a naive enthusiasm reinforced by the immediate cultural context: the belief in the expansion of human perception through a technological stratagem. In his current work a deeper set of references emerge. The didactic purity of machine as generative source is displaced by the machine as an environment of problematic semiotic codes that intrinsically project a self-critique into their sensory enfolding.

In the two installations to be exhibited, a radical philosophical issue forms the ideological structure that houses a set of often contradictory references. In *The Theater of Hybrid Automata* the core issue is that of physical being in the light of its virtual representation. Neither in a Platonic world of Ideal Form where sensation floats free of matter, pure signification written in numeric code without body, nor in an Aristotelian ground where language only projects and reflects its desires upon an imperfect universe, the robot eye navigates a purgatory of numerical coordinates to sustain an environment of control systems: a tautology of self-reference vaguely aware of the intruding spectator. Rather than an exposition of an electronic theater, it is a dream of an electronic theater that

their emergent language, forcing the spectator to swim in the intrinsic cultural code of the machine.

perspective, one that addresses more abstract and open-ended genres, expressions, and methods of representing principles and tendencies from beyond our psychologically based experience. I am interested in making models for alternate states of awareness.

### **Project History:**

After my encounter with 3D-animated computer image generation in the late eighties, I suspended my video image making and began to probe the relationship between objects and space. While "digital space" primarily offers expanded concepts of the world as seen through the camera, I was compelled to confront this newly acquired workspace as a virtual representation constructed within the computer, simultaneously coupled to an actual physical construction assembled in the form of an electronic "stage."

In 1985, Steina Vasulka collaborated with singer Joan La Barbara on a series of interactive compositions for which I designed the interactive media components. These were summarized in La Barbara's theatrical project *Events in the Elsewhere* which largely used design components of what was to become *The Theater of Hybrid Automata*. With the subsequent addition of a "cube" structure proposed by David Dunn, the system became a complex audio-visual machine. In this configuration the *Theater* was presented at Ars Electronica Festival in Linz, Austria in 1990. The following year the system acquired a MIDI violin as a control device and a laserdisc was added as part of the realtime interactive display for a performance at L'Immagine Elettronica Festival in Ferrara, Italy. For this performance the *Theater* included *Pariah*, a work designed for solo performer (David Dunn) based on our work with actor Tim Thompson. The *Theater* was

image locations, forward, backward, slow, fast, and variable speed motion. A lighting grid is also computer controlled as is the robotic camera head (RPT). Video images from both the camera and laser disc are projected onto screens. The entire construction is confined inside a room-sized cube (10 X 10 X 10 feet), framed by lightweight aluminum tubing on which are mounted the projection screens, calibration targets, lights and six loudspeakers. *The Theater of Hybrid Automata* is to be observed from the outside with the cube functioning as a transparent exo-skeleton upon which the various performing components are affixed and displayed.

Woody Vasulka, 1994



human activity. In the past, the term intelligence would have been freely applied to the similar machine state. Burdened with too much meaning, it is being replaced by more somber terminologies such as simple behavioral patterns or the more fashionable emergent properties of complex dynamical systems.

But the *Brotherhood* is after all an abstract piece and does not lend itself to correct analyses. If art should participate in this context, the authentic technological extensions and constraints will clearly impose themselves on the work. As of yet this is the most complex work I have attempted with requisite knowledge of various crafts: electronics, optics, engineering and computer programming.

#### **The Tables (General Description):**

Project *Brotherhood* is a complex assembly of six smaller arrangements acting in a mutually coordinated manner as a series of Tables.

The Tables are quadratic cage arrangements placed horizontally on metal table legs. Each Table contains instruments, able to produce, compose and display varied acoustic and visual structures. Additionally these clusters of technology exhibit a certain volume of behavior through digital programs or in reaction to a set of sensors associated with each Table.

#### **Table III (Functional Description):**

Table III holds two picture delivery arrangements: the first is a specialized slide projector while the other is a video projector. Each of these systems is associated with a family of images that occupy a specific projection environment: the stills

WV: I don't hesitate to speak about it because while I have always been intellectually opposed to it, in fact I've surrounded myself with these war machines and have adopted them. In fact the RPT robotic head in *The Theater of Hybrid Automata* is made from a celestial navigation unit that navigated the bombers for the Strategic Air Command. When I brought it to Europe and showed it to one of my colleagues in Brno, he looked at it and said: "now I know what you are doing because I was an adviser to the Egyptian military about missile navigation systems." He not only recognized the Brotherhood but became a "brother" of the Brotherhood.

DD: So, in your mind, this is becoming explicit as content. For years you have been working with surplus from Los Alamos but it was media related as appropriated materials for your studio.

WV: Now its become very naked as the content itself.

DD: It's certainly upfront in terms of this surplus material being the detritus of that culture of war. Artists here have been raiding the Los Alamos scrap yards in order to make these metaphoric expressions as a kind of critique of the nexus of science and military cultures. But what you are doing is taking very specific cast-off materials and, rather than refashioning them into a sculptural expression, resuscitating the structural intentions of these devices as a kind of pure articulation of their generative ideology.

WV: It has exactly the same purpose, to amplify the mind of its creator: the male idea of the machine's destructive power. This thing, a vestigial bombing rack,

# Digital Space: A Summary

David Dunn and Woody Vasulka

## Introduction

The concept of interactivity in computer science has generally referred to issues concerning *user interface* in the sense of those parameters of system control over which the user can exert influence. It is the intention of this proposal to expand upon this concept of interactivity to address its broader implications from a philosophical perspective with regard to the intrinsic properties of what we refer to as *digital space* and with specific interest in how such ideas impact the evolution of art through the existence of a new technologically derived perceptual environment for humanity at large. Additionally we hope to outline a preliminary research plan for the exploration of this perceptual environment which emphasizes the articulation and design of syntactical principles essential to this exploration. While our primary focus is upon the creation of works of art which would concretize these principles in the form of aesthetic research, it is our hope that the articulation of such syntactical principles will also be influential beyond the artistic domain and have direct application in such fields as *scientific visualization* and *virtual reality* research.

Our interest and insight into this new perceptual environment results from our many years of creative use of digital technology as an aesthetic tool that has often brought us to a direct confrontation with traditional ways of composing images and sounds. This conflict has not only been initiated by our interest in new forms in general but specifically by the profound implications of organizing our materials through a numerical code. What becomes apparent from the structural demands of this technology is that there is an ability and even an affinity for discrete genre to interact through the binary code in ways which transcend linear cause and effect relationships, revealing new compositional concepts with regard to space, perspective and morphology.

The experience of cinema informs us that the compositional decisions of editing are constrained by a syntactic set which results in a concept of narrative negotiable with an audience on the terms of the author. While this process seems fully justified for the pursuit of aesthetic communion within the confines of its medium, the intrinsic processes germane to the potential for interactivity in digital space demand other alternatives. The abandonment of a traditional syntactic set is essential within digital space since its organization is no longer the exclusive domain of the author. Since the narrative vectors can be organized by the biases of an *other*, new syntactic criteria not only becomes necessary but unavoidable. These new criteria shift the role of the author away from merely describing a world for aesthetic contemplation towards the design of worlds for dynamic exploration. Additionally this necessitates a redefinition of audience away from the *time sharing* of experience characteristic of cinema and performance to that of an individual who can exert greater free will in the exploration of an elastic perceptual environment.

## Aspects of Digital Space

In contemplating the important aspects of digital space as a perceptual environment for aesthetic exploration, a number of essential characteristics become evident. From our perspective as artists the most obvious possibility of the computer as a creative tool is its ability to generate entirely new and unique constructs of sound and image. However this possibility must be understood in the larger context of the more profound reality of the structural biases and potentials of digital space as a perceptual environment.

Perhaps of principal importance are the dual aspects of random access to stored data and the fact that this data can be comprised of information corresponding to different sensory modes of human perception reduced to a common structure in the form of numerical code. This latter attribute is especially significant in the sense that our usual experience of the electromagnetic spectrum as divided into discreet domains of sensory perception (i.e. sight and sound) can be coerced into an interactive space. The aesthetic and experiential possibilities which emerge from these characteristics of digital space are those of the non-linear specification of events in the sense of a polychronic and polytopic narrative of image and sound, a non-linear interpenetration between human sensory modes (i.e. sound controlling image and vice versa), and the ability to specify and control (either by the author or the user/perceiver) the characteristics of change between these various behaviors.

What becomes evident is that a kind of digital synaesthesia could emerge from this perceptual environment which can provide an experience of the concept of non-linear complexity which has become so profoundly significant to the

sciences at large. It is precisely the perceptual issues and problems which arise in attempting to comprehend this alien domain which we desire to explore. Since it is these same issues which face the scientific community from a different perspective, we understand that such an exploration could have profound consequences as tools for the perception of non-linear complexity in science and education. In fact, our interest is in formulating compositional and syntactical principles which might hybridize concerns and issues relevant to a variety of research fields in the context of the necessity for artists to participate, at the most intrinsic creative level, in the development of these technologies for the sake of cultural evolution and preservation.

As already discussed, the characteristics of digital space which imply new structural possibilities for art are those of random access, interaction between sensory modes within the numerical code, and a redefinition of the author's role towards the specification of a world for potential exploration. Because of the radical nature of these qualities they demand the articulation of intrinsic organizational principles which do not simply borrow from old forms. Since such principles could constitute what we have referred to as a syntactical set for digital space in the sense that tonality constituted a deep structural principle for 18th century music or perspective for Renaissance painting, it could be argued that the emergence of such principles might be better left to the self-organizing capacities of individual creative necessity. It is not our intention to specify dogmatic rules for the manipulation of digital space but rather to help set an exploration in motion which will undoubtedly be transcended by subsequent explorers.

While the use of computers within the arts has long recognized and taken for granted many of these characteristics, most computer art and music has not addressed them. There has been a general tendency to use the computer as a tool to emulate traditional art genre or extend formal principles of organization and structure. Many of these limitations have been structurally imposed in the sense that hardware limitations have dictated what is possible. With regard to the concept of interactivity this has resulted at the most primitive level in providing the user/perceiver with a sense of choice and/or participatory role in the unfolding of a narrative or structural change. With the dramatic evolution in circuit design, computational speed and memory expansion which have occurred in recent years, new strategies for interactivity have posed the possibility of artists creating worlds of sufficient richness to provide the user/perceiver with a sense of exploring an environment of new sensory relationships rather than a mere description of such a world. It is precisely this creative possibility and what it implies for the perceptual environment of digital space which is of primary significance. Thus the concept of computer interactivity can be understood to not only include the interface to a user/perceiver and the redefinition of authorship which that implies but more fundamentally to include the potential for deep structural interaction between the different sensory modes of human perception. The significance of a serious aesthetic exploration of these aspects of digital space extends beyond the domain of art to proffer an expansion of human imagination through the merger of artistic perception and scientific process.

## Interactivity and the Arts

While concepts of computer interactivity have been fueled and influenced by the creativity and philosophical visions of artists in the form of science fiction, actual developments have been dominated by the scientific assumptions of *artificial intelligence* research. While the ideal has been to optimally approach some sort of autonomous coupling between human and machine through the simulation of human intelligence and behavioral complexity within the technology, instances of this goal have not been particularly numerous. Actual implementation has often only addressed the expansion of user options within the confines of traditional concepts of system control. It is our contention that artists need to participate at the most fundamental level of system's design before a further advance in the concept of computer interactivity can unfold.

Our rationale for this assertion stems from a recognition that the computer signifies a new perceptual environment (which we refer to as digital space) in the sense of a domain for the unfolding of sensory, linguistic and social communication with new characteristics which impact our cognitive evolution, and that the exploration of this environment cannot substantially progress without human aesthetic fulfillment. While the issue of whether or not intelligence can be successfully simulated through the specification of systemic complexity within the machine remains an interesting and important research question for computer science, it cannot be the determinant of what constitutes the essential criteria of exploration and humanization of digital space. To this end we assert that artists must help to shape what is quickly unfolding as a fundamentally new perceptual environment which is ushering forth profound epistemological changes.



carries the inspiration with it. When I saw it for the first time, I knew exactly that this was a piece of that soul. I didn't even know what it was until I read it later but I understood it intuitively. When I opened the box, there was a table with four legs and these racks which I later read were part of these bombing computers. I envisioned these guys sitting in the jungle, just before they went to Cambodia, programming these computers. They were probably dressed in fatigues, drinking beer, punching the code into computers mounted on these racks. So I'm trying to replicate exactly the spirit contained within this piece of metal. It is probably subconscious but very authentic: these were the machines for automatic bombing so that no one had to have the consciousness or responsibility of inflicting death. These codes are hidden to the general art strategies unless one descends to this level of intimacy where you recognize by strange instinct the role of these objects. I think it transfers subconsciously to the mind of the observer. It is this third level of involvement that really interests me rather than the obvious one.

Curatorships:

Pioneers of Electronic Art, curated with Steina, a large exhibition of early electronic tools and instruments for Ars Electronica, Linz, Austria, 1992. Concurrent publication of a laserdisc interactive book and catalogue.

Professorships:

Polytechnic Institute, Brno, Czech Republic, 1993 to present  
 Guest Professor, Institute for New Media, Staedelschule, Frankfurt, Germany, 1992  
 Guest Professor, Faculty of Art, Polytechnic Institute, Brno, Czech Republic, 1993-95

Lectures:

Brainscomb Distinguished Artist In Residence, Folsom Library, Rensselaer, Troy, NY, 1991  
 Digital Environment, Carnegie-Mellon, Pittsburgh PA, 1992  
 NY Underground of the '60s, Rock Cafe Media Club, Prague, Czech Republic, 1992  
 Technical Museum, Prague, Czech Republic, 1992  
 Polytechnic Institute, Brno, Czech Republic, 1992  
 Kunstmuseum, Berne, Switzerland, 1992  
 Hochschule Der Kunst, Berlin, Germany 1992  
 Lecture on Video, Bratislava, Slovakia, 1993  
 Academy of Art, Budapest, Hungary, 1993  
 Three day Video seminar, Soros Center, Moscow, Russia, 1993  
 Three day Video seminar, Soros Center, Kiev, Ukraine, 1993  
 CNAM Polytechnic, Paris, France, 1993  
 University of Bourge, France, 1993  
 Ex Oriente Lux, Bucharest, Romania, 1993  
 Lecture at Symposium on animated film, Dresden, Germany, 1994

Participation in symposia and festivals:

Festival of Music, Nice, France, 1993  
 Art Symposium, Bucharest, Romania, 1993  
 Seminar/workshop, Art Academy, Bucharest, Romania, 1993  
 Trans-disciplinary Workshop, Goethe Institute, Prague, Czech Republic, 1993

## The Electronic Theaters of Woody Vasulka

David Dunn

While the work of the Vasulkas has long been a seminal influence upon video art, they have maintained an aloofness to the fashions that have recently compelled that genre. Perhaps because their work began within the cultural climate of the 1960s, it has consistently investigated electronic technology and media as a cultural environment that, for good or bad, not only carries with it a new visual ontology but more essentially a potential for perceptual exploration. All of their work is in some way connected to a fundamental agenda: to interrogate the intrinsic properties of the machine as cultural code and the latent or overt perceptual changes that emerge.

As the retrospective of early video art and technology that they curated amply demonstrated (*Eigenwelt der Apparatewelt, Ars Electronica 1992*), the co-emergence of video art and solid-state electronics during the late 1960s represented a unique historical window: the artist and engineer were inseparable, participating in a collaborative dialogue from which the systemic identities of the machine and art product met in an unprecedented mutuality of form and function. In retrospect it has become evident that this opportunity for artistic influence of technological innovation occupied a very narrow slice of time. Within less than a decade, commercial forces had displaced the artist/engineer with the mainstream cultural agenda, redirecting artistic innovation towards satiating the needs of the popular film and broadcast industries. This situation has only become more acute as the structure of media tools has moved into a predominantly digital domain. Technical innovation is now synonymous with commercially motivated improvement in the production

parodies the dark side of a cybernetically-controlled environment. With the eerie efficiency of a high-tech office building after the workers have left, it rotates through its automatic behaviors, devoid of human presence yet awaiting the birth of an unknown form of dramatic action as absolution.

The *Brotherhood* further explores this conflict between matter and its representation within an historical frame: the link between male violence and technology. While this subject is overt in the choice of the sculptural frame material that forms the armature within and upon which the media action unfolds (*Case and Rack Assembly Bomb Navigational Surplus* from Los Alamos National Laboratories), it is also present as embedded content: phallic pneumatic pistons that control the revelation of circuitry designs related to nuclear weapons fabrication, sounds of industrial process as ritual sacrifice, radio transmissions of "friendly fire" death verifications in warfare, and silent explosions in animated space as targets for virtual projectiles. All of these references intersect to form a larger revelation of the male idea of the machine's destructive potential and reveal the underlying archetypal psyche without overt horror or celebration. It is an evocation of an invisible intention as if this rack was a power object around which hovers the ghosts of its generative mentalities.

In both of these installations, the role of the viewer only hints at the current fashion of interactivity. The audience is not readily invited to control the action like a video game and therefore enact a preconceived ritual of pseudo-interactivity. These environments remain autonomous with only a potential for perturbation by an intruder into their drama and therefore assert a specific kind of interaction: these are autonomous worlds that define their closure through

## The Theater of Hybrid Automata

### General Description:

*The Theater of Hybrid Automata* consists of and operates in two dialectically engaged spaces: the actual and the virtual. The actual is the physical stage which supports the robotic and space calibrating hardware while the virtual is present in the form of data-based media. Fundamentally it is a computer based interactive environment, incorporating video, electronic sounds and robotics under realtime control of voice, sound, gesture and text through digital software. The software takes an active responsibility for the management of a robotic camera, speech recognition box, video laser disc player, loudspeakers and lights.

While my ambition is to continuously intercept and exercise a variety of machine to machine and machine to human communications through an underlying system of codes, this activity also promises to articulate the possibility of a new aesthetic structuring: the specification through software design and hardware integration of an automated theater where an aesthetic/experiential confrontation between a physical space and its synthetic model can be composed.

While *The Theater of Hybrid Automata* is an attempt to employ the instruments of new media in the operation of a dramatic space, its construction derives from a long tradition of dramatic and spatial experiments that form a critique of psychological drama as presented in film and theater. My wish is to explore something that appeals to human perception from a different

awarded the L'Imagine Elettronica Prize. Last fall, it was exhibited at Artifices 2 in Saint Denis, Paris.

### **Technical Description:**

*The Theater of Hybrld Automata* is an ongoing project involving a pool of enlightened electronic tools configured as a virtual reality construct coupled to an electronically controlled stage. At its core is a space-exploring machine which unites a configuration of physical sensors interconnected by various communications protocols: a RPT (rotate, pan, tilt) robotic head capable of moving a video camera through an unlimited orbital range of all three axes, a pair of opposite-facing infrared transmitters, a set of position calibrating indexes, and motion control motor drives. These devices function within two main space-related operations: the "pointer" mode in which the system points to prescribed locations according to a computer program, and the "locator" mode in which sensors randomly scan discrete areas of space, reporting on the coordinates. As the infrared transmitters rotate through space, stepping through various spatial locations, their coordinates are continuously relayed to their receivers. These receivers map the transmitter positions and an audio sampler is triggered to retrieve specific words and sounds from memory.

Through MIDI communications protocol, a single computer mediates the entire environment, assigning reports from the sensors and managing all other components of the *Theater*. Attached to the computer is a speech recognition system capable of listening and speaking in response to a learned set of verbal commands. Also under computer control is a laser disc player with random access to images. Its command vocabulary includes: instantaneous access to

## Brotherhood

The *Brotherhood* is a summary of media concepts presenting a specific domain of ideological and personal concerns. While the central theme of the *Brotherhood* revolves around the dilemma of male identity, it could be understood as arising from the general compulsion of mankind to re-organize Nature itself. This process is of course destructive to the natural order and leads to conditions of polarization and antagonism in various social and philosophical strata. It presents the male once again in the context of warfare as an expected and integral part of human evolution, in the construction and abandonment of human utopia, in perilous values of male sexuality. This work does not argue for a reformist agenda or a strategy of defence. It stands sympathetically on the side of the male but it cannot resist an ironic glance at his clearly self-destructive destiny.

While avoiding a single discipline, genre or style, the work tends to track clusters of systemic expressive primitives -- those which seem human-like yet reside within the machine.

The frustration at describing the modes of various media participation found in *Brotherhood* lies in a generic failure to interpret concepts like human or machine "intelligence." While certain electro-mechanical systems can contain a volume of cultural property, their usefulness or value can only be judged against the exclusive domain in modelling of certain human behaviors or in acquisition of procedural rituals. For example: Table IV possesses the faculty of performing physical letter writing under the control of a human voice via microphone, digital voice recognition and plotter system, thus emulating this rather complex

are confined to a small six screen layout while the moving images occupy an extended projection environment. Both kinds of projections share the identical pathway of a six-way beam splitter with the images distributed along six axes of cubical vectors to the six screens. During the still image sequence, the projection is intercepted by smaller screen/frames defining its own projection environment out of the general space. These small frames fold, freeing the projection path for the moving image sequence. This extended projection environment is defined by an arrangement of six projection screens, four standing on the floor plus one suspended from the ceiling. The character of the screen material lets the images appear on both sides, extending the installation's observation mode from the inner core to the outside. There the installation becomes an object with a multitude of interrelated images. The installation has additional functional elements of sound and interactivity. These provide a mode for determining the observer's presence and a certain level of participation.

**Excerpt from a discussion between Woody Vasulka and David Dunn:**

WV: I've incorporated vast amounts of military equipment into this piece. If you read the label on this table it's called: "Case and Rack Assembly Bomb Navigational Control." It's crazy that these things come to my house so I took this and incorporated it into my targeting system because this is what it really is. It was designed to navigate bombs so I'm using it to navigate my pictorial corridors which are basically trajectories of invisible projectiles.

DD: So that's an overt connection to this idea of Brotherhood and the machinery of war.