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GENERIC REAL-TIME INTERACTIVE DIGITAL ARNOT ART MUSEUM July 12th-September 28th, 1986

PEER BODE INVENTED EYE/ MEMORY TRACTS

PETER CHAMBERLAIN & CURT DUNNAM AUTISTIC AUTOMATON ARMADA JOHN DRISCOLL TROUT FISHING IN BERLIN (Trombone Section)

> PHIL EDELSTEIN EPISODES

RALPH HOCKING INSTALLATION 1986

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# ACKNOWLEDGEMENTS SPECIAL THANKS to: The Arnot Museum Staff

Ken Lindquist for his fearful but trusting support throughout Pam Beecher for her advice and willingness to take chances for quality The Artists' enthusiasm and professionalism And to Susan and Iris for their tolerance.

A Special Preview Opening and Reception for Trustees, Members and Media Guests will be held Friday, July 11th, 1986 from 5 p.m. until 7 p.m. Plan to attend and meet the artists.

Sponsored in part by The New York State Council on the Arts and The National Endowment for the Arts. Notes on G.R.I.D.

G.R.I.D. is an exhibition of electronic works by six artists who have had various involvements with each other in the past.

Since the seeds for G.R.I.D. were planted in 1983, the premise to encourage the exhibition to grow collaboratively has been maintained. The denominators common to all the artists involved can be fairly well defined by the words GENERIC, REAL-TIME, INTERACTIVE, and DIGITAL (inclusive), hence G.R.I.D.

- GENERIC, although literally defined as "Not protected by trademark" implies a home-brew or do-it-yourself attitude consistent not only among the artists involved, but also throughout the development and realization of this exhibition.
- REAL-TIME, implies non-static activity that exists in both space and time AND is witnessed in a LIVE sense (loosely, like theatre as opposed to film).
- INTERACTIVE, refers to parts, things, objects or modules that derive their significance from their working relationship with other parts of immediate systems or environments. Although the work in this show depends to varying degrees on interaction with outside stimuli (audience, architectural, environmental), the artists involved most often use inter-changeable and interactive modular systems either to produce work, or AS the work. This means of working is directly relevant to the real-time attitudes present.
- DIGITAL simply refers to a new type of electronic technology that offers numerous options not practical with the the older ANALOG electronics. The DIGITAL denominator is a categoric factor, technically common to these artists. Electronic might be a more wholistically definitive adjective, but given the present, exciting, and increasingly accessible developments in digital electronics (what most of us think of as computer stuff), this group has embraced DIGITAL.

As a precariously general historic reference, note that in the sixties we were all intrigued with the "newness" of electronic arts.... electronic music, laser shows, electro-kinetic installations, video as a medium, and the relationships between art and science in general. Star-Trek was a priority. Now, two decades later, these tech-elements have been absorbed comfortably into our normal working vocabularies.

Painters, sculptors, and musicians are always searching for new imagery, techniques and compositional form. Excepting our willingness to deal with multi-media, we are no different... we are artists whose tools are based in an electronic world.

Work of this nature is hard to catagorize, hard to fund, hard to make, hard to exhibit and hard to explain; even so, the show goes on. I thank Curt, Phil, John, Ralph, and Peer for their informative and cryptic writings. I also thank the Arnot, the N.E.A. and N.Y.S.C.A. for making it possible to offer such an exhibition to the Elmira community. My multiple roles as curator, artist and technical director have made this show an ominous but exciting challenge to me.

My opening/closing advice to the gallery-going public is simply to enjoy the show with all your biological sensors wide open. (Beam us up, Scottie!) Peter Chamberlain, Elmira, 1986

During the past 10 years Peter Chamberlain has been actively involved in the production of sculpture, music, performing art, video and multi-media installations while teaching sculptural arts, media arts and contemporary art criticism at Elmira College.

Consistent in his commitment to augment the contemporary arts of the Southern Tier and Finger Lakes region, he has offered us a variety of personal performances and exhibitions. He has also worked in administrative and technical capabilities with the College, the Arnot, and the Johnson Museum on projects involving non-regional artists. Additionally he has developed an experimental electronic arts lab at Elmira College which merges video, electronic music, computers and other digital image processors.

Regionally, he has given us WOOM, an underwater computer music concert; various concerts on electronically modified Steinways; several performances with dancers at DANCEMAKERS STUDIO in Ithaca; an informal concert for dry ice, sheet metal, video and goldfish; and, in addition to annual faculty exhibitions, a 5-year retrospective at the Hamilton Art Gallery.

Nationally and internationally he has performed or exhibited at Fashion Moda Gallery and the Museum of Contemporary Crafts in New York City; at the Renwick, Smithsonian, and W.P.A. in Washington, D.C.; the Artists Gallery, The Helen Pitt Gallery and Pumps in Vancouver, B.C.; in Mexico City, in Essen and Schwabbing/Munich, West Germany; and in Rochester, Buffalo, Peoria, Miami, Albany, and other obscure cultural meccas.

The G.R.I.D. exhibition was conceived by Chamberlain in 1983. Since that time he has worn the masks of consultant, guest curator, technical director, and participating artist.



How this came to pass? Chronolog withdrawl from almost besides: epi- besides choric songs. 5. Mus (qwerty that is). eis, into + hodos, way, statements of a main su form: circuit, comput rondo or resorting to paper and "addition," media from 1972 or so, supplies the rest. and commerce, sculptur shopping lists, crude the course of a contine and music, sound and drawings, photographs, wous experience 2. A steps that brought me tEPISONES. I am maybe a little to LISTENING TO MICROPHO from the Greek kataloguo self-concious of the NES, THE VISITATION, s, from katalegein, to ideas on magnetic media Since light, literature and t cassette recordings. portion of a narrative he void. juxtapositions: circuit proposals, character s1. An incident or seriry and performance, art tudies, diary entries, es of related events in never would have come technical descriptions manufacturers. development interfacinMy obsession with tech balance, an active vieg debugging programming nology has progressed wer who must draw paths environment "PAUNFORE completely different me is willing to accept ST IV" - Itinerant ssages and images, computer hardware sof meaning, lack of rtware research design involvement in non-tradin context than contemmultiple perspectives.itional music, theatret. Graffitti makes no A multi-dimensional (lighting), electronic sense as printed matobject viewed only in s and computer (gasp)erial. "Marry lowes one silouette carries science, multi-media. Patrice" scrawled on hothing of the impact o - 1971 to present: a train trestle over f the fully dimensioned cover: "May I Like as a material. As in ofor materials unreach Electricity" itemizing ther forms, the content able in other forms. sets, electricity. understanding the nat - 1958, first manifestoure of this medium. written for 5th grade cSoftware has strong chikorking in sculptural mlass under the general aracteristics, unique edium teaches a regard sets, electricity. understanding the nat child interested in modI am interested (read emotional. He was an introspect something about intent.challenge is using comis now too limiting. stations, with and for artists, from a pre-occupation between points. The in engineers, composers, with functionality and ages here are fragments bankers, brokers, correctness to deepe intended to invoke ratscientists, television r considerations of her than describe. The Touring with David Tupenned into a furtivThis work is meant for dor's sound sculpture e diary, performances video dinterstate 95, carvedobject. Studies in Technology confines of a CKT diffelThis piece for me works and Art" based on heavyr in meaning based more only when viewed from 2, 6 or 23 years depend different sense withis show is an extening on interpretation), an rendered as an sion of this teaching graduated from state uninflatable. Text on a into the realm of softwiversity in upstate New written page, scrawled are. 1973, after followincharacteristics of the sound sculpture, is g a somewhat erratic medium. A sculptural a master that teaches interest in physics anform executed in steelexpression native to ad meth (lasting either takes on a completely medium. The work for production of sound anof a work is inherentl Sculpture in general, d light as reasons. - y intertwined with the but more y and including This starts, writing.) A Catalog Entry for EPI installation York with exotic degon a urban wall, or n 1973, after followincharacteristics of the sound sculpture, is (Starting, it hadn't been my early work situation, the moment, coherent story in itsel with audio and video the place. The viewerf; an incident. 3. auto-biographi information rather than opens my work from theal sketch: biographic depending on how you cconsisting merely of soal information and are to see it). This und, object and space, a central A factories, appropriateness, expresfinal work is in not so exhibitio tree down by the swimmi time and space around great leep forward or b a catal world that such window of a well-synthesized sog entry for EPISONES, s look into (or out, on ound, a sound sculpture letters and fragments for picat-a-log extract those element or series of connect In scawlings from 1980 ω time and space around great leap forward or b exploring the ubiquitou have somehow taken a theatre, as a vdifferent mode of comp central challenge the line, or in the we allegory evocation, spatiOnce upon a time, my gu hallucination, enve view ... decomposed stories collage, to myself There ar recount, an enumerationo this work. Surely Ie circuit lescriptions upon this mode of work, computer fugue. like; an installment.er program. I wind up [Greek from ep classic Greek tragedy other media in fits of eisodics, collect ep-i-sode separately presented pI have kept sketches of meaning, novel, play, radio or t or in other electronic improvised) into the ive moody hyperactive beholder as much as in of the procedure, the p in electronic media was stallment, er program. I wind up [Greek epeisodion, 4. A section of a k tragedy other media in fits of elsodios, coming in that occurs between two 5. Mus ever present keyboard + elsodios, coming in :ic. A passage between ree "Interdisciplinary endered in the sterile ular toys, construction that obsessed) with ance media projects into the big old oak for seemingly jarring and others, ns composition design - ng hole, or carefully SODES (1983-86) terror and joy museums, computer sion and content. March 1986 Stratford Phil Edelstein bedded structure, of is confronting s that fit a given ed events and forms a eces, onwards, I find titles s computer screen, the radical departure, a al construction, ion, From this morass, I that relates an event puter time and space as I've turned to a very ehicle for emotional osition that hopefully road. technical information.e stricly formal (yet more allegorical, the computer programs, images, aural some presented characters, function as the solitary viewer who diagrams, project and b as the case may be, ambiguity, conflicting bject or theme, as in a elevision drama, or the ortion of a serialized their mind. esolvability, much in the eye of the rocess. Somewhere along iding concept of a work based in the integrity specifically dynamic

What's go

ing on here?



John Driscoll

# **Installation - Arnot Museum - John Driscoll**

# Title: "Trout Fishing in Berlin" © 1986

Description:

**Trout Fishing in Berlin** is a sound installation which was created by John Driscoll while living in Berlin as a fellow of the DAAD Berliner Kunstlerprogramm. This work is a part of a series of sound installations started with fishing poles in mind. Much as the mexicans have dry soup, the installations use fishing poles without fish.

It uses telescopic fishing poles from Italy, often used for eel fishing. These poles are used in many ways; as loudspeakers, microphones, and supports for loudspeakers. The sound material has been produced electronically and stored on tape for the installation.

Technical Requirements:

(1) Loudspeaker - minimum 100 Watts power @ 8 ohms with strong bass
(1) Amplifier - minimum 100 Watts (can be Stereo)
One Table 2' x 6'
One power cable with a multiple AC box
One microphone stand with boom (as heavy duty as possible)
One ladder
Assistant - one day for hanging, cabling, odd items, etc.
Adequate Lighting (5-6 spotlights)

#### CREDIT: Fishing Poles Courtesy of Europesca, Rome, Italy



# JOHN DRISCOLL

Born in Philadelphia, PA, 1947, he began working in sound sculpture and electronic music in 1968. He has been collaborating on David Tudor's "Rainforest IV" since its inception in 1973. He has toured extensively in the U.S. and Europe with Composers Inside Electronics, Douglas Dunn & Dancers, David Tudor, and as a solo performer. His current work is with robotic instruments, compositions for unique architectural spaces, and sound installations.

In 1982, the Exploratorium commissioned Mr. Driscoll to create a permanent exhibit Unsung Voices for four ultrasonic sound sculptures played by the public. The ICA (Boston) commissioned a collaborative work Second Mesa (1982/83) along with Douglas Dunn. Richard Lerman, and Jeffrev Schiff, which used the gallery acoustics activated by four rotating loudspeakers. He created an installation work Third Mesa (1984) which is a sound environment for multiple robotic rotating loudspeakers for the New Music America '84 Festival. and three new Unsung Voices (1985) sound sculptures for a four month installation

at the Staten Island Children's Museum. His recent sound installations are: **Wafer Flats** (1985) for Galerie Giannozzo in Berlin, and **A Hall is all** (1985) for the Friedenbienalle in Hamburg, and for the Inventionen '86 in Berlin.

Mr. Driscoll's recent awards include a Media Study/Buffalo Project grant for **Third Mesa**, and a DAAD Fellowship to be an Artist-in-Residence in Berlin for one year to further his work.

He recently created **Sputtering Energy - at 500 times the true size,** a performed sound environment for four rotating loudspeakers premiered at the "Invention '86" festival in Berlin. He also collaborated on a theater work **Ice Fishing** with Giovanna Rogante and Nicolas Cincone from Florence. Circuits have personalities.

One needs to stockpile parts in order to be spontaneous. You always have more than you need for the job. Sometimes having certain parts in stock inspires new circuitry.

A circuit can be used in many ways it was not intended to be used creating a new function and perception of what circuits can do.

You can build a circuit once and it works in a very magical way. The desire is then to re-create this circuit. It rarely works in a magical way the second time it is built.

David Tudor once was using a particular circuit in performance and it failed, but it produced a unique sound in the process, now it is used without the power turned on in order to function properly.

There are times when a sound is produced which cannot be traced back to any circuit responsible for it.

Certain people have the ability to heal electronics without opening the box.

An input can simultaneously be used as an output. An output can simultaneously be used as an input. Now which is it really? Sound modifying equipment can sometimes create new sounds which are no longer related to the original sound in any audible way.

One spice combined with another can create a flavor which is not related to the original flavors of either spice.

Amongst leading particle physicists there is a theory that the more you observe a phenomena the more it is affected – thereby making the observation of this phenomena in its natural state impossible.

Many people enjoy eating without the slightest idea of how to cook.

Many people successfully use electronic equipment without the slightest idea of how it works.

Once while observing an installation of sound sculptures I made for a children's museum in Staten Island, I overheard a teacher explain about the origin of a number of african musical instruments. She explained that they all came from natural materials: wood, hide, hair. pigment, etc. Then she came to my sculptures and she explained that these are made with electronics. Much to my surprise, that was all the explanation she gave, leaving the children with the impression that electronics are some odd substance from a foreign planet.

Electronics has its origin in ancient alchemy. It is a witches brew of iron, sand, copper, gold, carbon, ceramic, tin, lead, crystals, and numerous exotic natural materials.

A recipe/schematic is not how to make something, it is the idea of something.

There is a theory among some cooks that one should not watch a souffle rise, or it will immediately fall in the oven.

For two years I worked as a puppeteer for the Smithsonian Institute in Washington, DC. After finishing this job I had a strong desire to create an automated theater (Mechanical puppet puppets without a story) I spoke of this with a number of my associates, and they thought me somewhat crazy. I abandoned the idea. Years later, while giving a talk, I realized that all my work for the past 10 years had been a realization of this project.

The further south you go in the world, the hotter the food gets.

The Etheopians' believe that when you prepare a chicken dish you must serve not only the chicken meat, but also a hard boiled egg thereby keeping the mother and child together.

John Driscoll



OSCILLATOR



VIDED -

BUFFER - CONDUTER - PRINTER

DUMP OR

Oscillator - Video - Buffer - Computer - Printer Dump /or/ Memory of the Relative Content







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PEGAL BODE 1984

Peer Bode

My project is an art practice that is theoretical as well as aesthetic... to engage and enlarge the domain of language as it relates to visual forms in time ie. ---- the temporal ----

... New Digital Rhetorics and the Unknown ...

.. Electronic Discourse .. Digital Cinema .. Theoretical Tools ..

Artist — object — existence — not unique objects but discourse ... Physics has never found any 'solid' phenomena, only energy event complexes ... only RELATIONSHIPS ...

Video artist Nam June Paik was interesting when he said 'Moon is oldest T.V.' ... but moonlight reflected to eyes so — Moon is the oldest Movie — and Sun is the oldest T.V. —but too bright — also bad for eyes ... But then the moon is not a projection but a 'real' object — the Moon is the oldest sculpture — with gallery theatrical lighting. — The distant suns, the stars, are the oldest digital pixel graphics —. On a biological level maybe glowing phosphorescent moss or fashionable glowing fish, — the first phosphorescent T.V. displays —. — Fireflies are the oldest digital pixel graphic — with program stored in firefly genetic code. Fireflies … the oldest biological computer bric-a-brac.

I am a recording artist. My mediums are video tape and computer disks. My project involves activating the sliding languages of Art, Science, Writing and Desire.

'INVENTED EYE/MEMORY TRACTS' is an installation of multichannel Video and Computer prints. ... Linguistic and non-linguistic forms of seeing...seeing the seeing ... memory ... modes ... parameters, the digital world with its multifunctional relationships ...

I am not waiting for a promised sign.

Communication(s)Design(s)Electronic(s)/sending—receiving—making ... ART ...

The Subject you are here +/- expectations ... interest ...

The Artist Is Another Audience The Artist Is The Work The Work Is The Audience The Audience Is Another Artist The Video and Digital Is Seeing The Seeing ...

Video as an artform will not approach the sustained achievements of the other historical arts until artists are allowed to be artists using electronic tools and developing ideas in the structure of personal studios. Strictly industrial processes can create art but mostly create narrow industrial forms. I'd rather experience the complexity and power of an informed industrial and artisan poetics. The electronic artisan is yet to be discovered as a significant force in new media work and ideas. My support goes to the Electronic Media Artists. Viva Video ! Viva Digital !!

I DO/NOT LIKE ART BECAUSE it is not exact and overdetermined thereby leaving room to be speculative and provisional, room to construct, play and wonder.

I DO/NOT LIKE TECHNOLOGY it attempts at the absolute and exact and it is overdetermined. I have even discovered how to use it leaving room to be speculative and provisional, room to construct, play and wonder.

Mine is not so much an art of SPACE as it is an art of TIME.

To want these things is one thing. To achieve them is another.

I am interested in the fact of how language and images, both material forms, become each other and provide the elements for rich complex ideas and experiences. When does the matter with it's interrelational possibilities become significant form and idea?

My Dog Knows Me Therefore I Am.

OR My Computer Detects No Error In My Program Therefore I Am. OR The Tool And Process Allows Me To Reflect And Interact With The Event.

OR The Completed Piece Is Infact Incomplete and I Am Involved In Constructing The Work.

I AM WATCHING IT ... !

ELECTRONIC IMAGING TOOLS ARE PERCEPTUAL AND CONCEPTUAL A M P L I F I E R S ! !!!!

To traverse from computer code to perceptual code is to have understood a cybernetic machine language and have used it to generate information in relation to human language capabilities. The computer machine is exact and correct in the execution of the program. However, the computer, which might make the work, does not make the art nor can it understand and enjoy it ...

There are high and low definition systems. Which generate more information? ... There can be a freeing (therapeutic) effect to INEXACT interpretations.

If our habit of thought and social customs are linked to our religious, cultural, and linguistic backgrounds what happens when we enter into unknown languages such as Cybernetic, Digital, and Electronic (influenced) discourses? New languages = change(s) in

THOUGHT patterns ...

Art is also an intellectual discipline. There is no problem in this if we are willing to extend our adventures with the unknown to thought as well as vision. Art is subversive. It can always challenge what we know and don't know. Are we ever capable of a complete analysis of our situation?

A single work is a curious artifact of a makers ideas. A body of work (the word body is curious!) is a trace of the history of a/the /artist's/viewer's body. This becomes meaningful when working with machine systems. Compared to electronic technologies are we ONLY human or better ESPECIALLY human?

There is a language to electronic imaging ----There are image Sources, Processors and Controllers. These technical processes occur primarily in 'real time'. Simultaneously a collaboration between the artist and system architecture occurs, the result of which is recorded on videotape or computer disk.

There is a language to electronic imaging viewing ----

There is the artist, the electronic imaging and the viewer. This is also a collaboration that results in an internalized construction and experience which makes the functioning of the work. The work is a play of forms. The work activates the field of imaging and language. These microstructures are continuously active, adjusting and changing their functions over time. This is the territory of activity that the notion of 'PROCESS' embraces. This is the unspoken story or narrative of these works. It is an open-ended narrative, a network of multifunctional parts, a multiple series advancing, diverting, reverberating in a shifting field of perceptual and conceptual relevance. Process is more than any single idea.

These words are not the video and digital work. But they do live along with it for me. There is the concrete physical work, the electronic imaging ----a discourse with/out words and yet dialogueing across all languages ... the rhetorics, the fictions, the images, the conventions, the unknown : the unknown images and the unknown names ...

These are ideas I am thinking about / (with) ...

and time ...

of all my assistants time proved the most useful ... at least the most interesting ...

Time to test these thoughts ... electronic imaging on the other line, excuse me ...

Peer Bode

#### 1986 Owego, N.Y.

Peer Bode has produced work in dance, performance, photography, film, video and digital. Since 1978 he has been involved in digital and video tool development together with electronic system designer David Jones. Over the past ten years he has produced a large ongoing extended series of video works entitled "The Process Tapes". This work has been exhibited extensively nationally and internationally. During the past year he has been on the faculty at the Center of Media Study, S.U.N.Y. at Buffalo teaching Digital Arts. Presently he is media artist and programs co-ordinator at the Experimental Television Center in Owego, New York.



Ralph Hocking

I was trained in the making and study of pottery and sculpture. The Han Dynasty in China and The Medieval period of England produced what I wanted to do with pottery. Rodin did the same for sculpture. I turned to photography partly because of a lack of patience in the art-making process and partly because the art was stackable in a small amount of space. Video and computers were the logical next step because they are photography dealing with time and the processes are more immediate than film.

Video and computer tools can be used to generate and record images and sound. I welcome the limitations of these tools: A defined two-dimensional space governed by laws perpetuated by the profit motive. Much more understandable than the problems I have with charcoal and paper. Remote control, a concept dear to a child of the Thirties, knobs to twist, switches to flip, images being banged out by little hammers onto paper, and electrons spraying a magical pattern of light before my eyes. The stuff dreams are made of.

I live in my senses, especially the eyes, and then the ears and touch. Video gives me a connection between these parts and thinking. That's enough. I don't want to change society, protest current conditions, or make sense to others through my art. I do those things in other ways. My art is simply the result of my experience. The work has to do with naked women, sex, machines, and problems related to seeing.

My early work began with single camera images processed with a keyer and limited special effects generator. When I acquired a Paik/Abe synthesizer in 1972, I began exploring multiple camera images based on mixing, image reversal, horizontal and vertical rate switching and color. The next development was voltage control of the image processing. Most of this work was done in collaboration with Sherleen Miller. I would set up a situation and she would react to her image and I would keep changing the relationships she saw. The main body of the work was concerned with simultaneous views of Sherry in movement or in a single pose. Usually we would use between four and six cameras. Most often the cameras were black and white and the signals were processed through the synthesizer. I often used square waves to control the keyers clip input allowing for offsetting of portions of the images. Most of the work during 1971 to 1978 was not edited. We would do several versions of the same setup, repeat ourselves, rather than try to edit on the decks available to us at that time. Time was not rearranged.

# **Ralph Hocking**



I am currently working with computer processed frames of video. I have always had problems with the time aspects of video. I tend to see video as single frames strung in a continuum representing movement in time, which of course it is and should be. I have a tendency to look at the frames individually and become enamoured with the structure of the individual frame thus losing the sense of continuity needed to understand time. For now I have given in to the struggle and am concentrating first on the individual frame and secondly on exploring time using more than one frame within the design of a single space. I am still making tapes but they are all based on thinking about the resulting printouts from the computer.

In the process of this exploration, David Jones and I have developed a computer program that now encompasses twenty-six individual commands ranging from the input of images from tape, disk, or camera to outlines, keying, superimposition, and other traditionally analog video techniques. All of these machine simulations are the result of software commands controlling locations of memory in a frame buffer and the main computer memory thus making it possible to store two frames and have them interact with each other, store the result of the two, add another, and so on. The results are printed on a dot-matrix printer in 256 x 256 resolution. The printing is done with black on white. The shades of grey are dependent on multiple passes in an additive buildup of ink. While I am curious about using color printing I am also somewhat content with the strength of spatial and form definition in the black and white mode.

In addition to my personal art-making I have been teaching video art-making in the Cinema Department of The State University of New York at Binghamton, New York for the past thirteen years. I am also the founder, president and director of the Experimental Television Center Ltd., located in Owego, New York. Both of these activities are directed toward the exploration and development of video as a visual art form. The University is a training ground for cinema artists. The ETC Ltd. is a place where practicing video artists work on their individual productions. The ETC Ltd. also has a research and development program concentrating on the invention of low cost analog and digital tools and the development of software to support these tools. The main thrust of the ETC Ltd. is to encourage individual artists to develop a personal studio for their own purposes of video art-making. This is based on my feeling that the artform will not develop fully unless daily contact is possible with equipment necessary to produce the art. As the cost of machines and components declines, we are coming closer to that goal. Ralph Hocking, 1986.



Curt Dunnam is an Electrical Engineer at the Laboratory of Nuclear Studies of Cornell University.

"Buffer Image by Dave Beaty"

"Photo by Kate Epstein"

# ARTIFICIAL INTELLIGENCE: CARBON LIFE AND SILICON LIFE

Artificial intelligence can be thought of as "silicon life", and evolutionary (or genuine) intelligence as "carbon life". The component parts for carbon life - cells - first appeared about four billion years ago. Today, four billion years after the primordal cell, carbon life draws on a massive biotechnical base. Humans are made of enzymes, hormones, glands, nerves and specialized cells like blood, brain and bone. Humans repair themselves and fight disease with other specialized cells; dedicated cells even exist for functions like reproduction.

There are many differences between carbon and silicon life forms. Humans have the ability to acquire large amounts of information through sensors. Brains come equipped with virtually infinite memory, and humans seldom need to search through that memory space because the memory images are seemingly right there when called upon. However, while the memory capacity is there, the instanteous computational power is not. Determining the cube roots of large numbers usually takes a little time. Finding the cube root of 27 is much simpler because the answer is more easily remembered. Instead of compute power, humans have memory and reasoning ability, which are much more useful in an evolutionary sense.

A comparison of silicon and carbon life hints at the differences between a computer used for artificial intelligence (AI) and a computer used for electronic data processing (EDP). EDP requires a fair amount of compute power and relatively little memory. But AI is knowledge based. Consequently, it requires a lot of memory and relatively little compute power. As a result, AI computers put more energy into managing memory than into computation.

The idea of duplicating human cognitive processes was first promoted by Alan Turing. To avoid the ambiguous question, "Can machines think?", Turing proposed a standard for artificial intelligence which has become known as the Turing Test. Human subjects are given access to two terminals, one of which is connected to a computer and one of which communicates with a human. Subjects may enter any messages on either terminal; the goal is to identify the human by examining the responses. If a subject cannot tell the difference between the human and the computer, the computer passes the Turing Test.

Silicon compute power increases with memory size and speed. A comparison of top-of-the-line silicon life built by Cray Research, Control Data, and IBM with carbon life shows that the large, high-performance computers have roughly the same compute power as a bee or mosquito. A mosquito has more sensors than any present computer; at the same time the insect is so compact that we hardly see it. The difference in compute power be-

tween mosquitos and chimps is a factor of 10'. Future computers still need about 10,000 times more compute power than existing supercomputers to equal that of chimps, and perhaps another factor of 10 greater to equal that of humans.

By the year 2000, hardware will probably be able to achieve that amount of compute power. However, the availability of hardware does not automatically enable the emulation of human- or chimplike intelligence. Doing so also requires adequate software. While hardware improvements can be due to causes outside artificial intelligence, artificial intelligence researchers have to work on the software. It is doubtful that by the year 2000 scientists will understand enough about knowledge, learning or self-awareness to build those gualities into computers only marginally commesurate with the task.

#### COMPARISON OF RELATIVE INFORMATION PROCESSING POWER:

| Pocket Calculator  | 10'              |
|--------------------|------------------|
| Slug               | 10               |
| Bee                | 10'              |
| Today's Computers  | 10'              |
| Proposed Computers | 10"              |
| Human Vision       | 10 <sup>12</sup> |
| Humans/Chimps      | 10 <sup>11</sup> |
| Sperm Whale        | 10"              |

The above observations were abstracted from "What is Artificial Intelligence?", by Richard E. Morley and William A. Taylor, appearing in Digital Design. April 1986.

Curt Dunnam, 1986.

Claude Levy-Strauss, an anthropologist, once described the artist as a descendent of the primitive bricoleur - a handy-man, a putterer, a jack-of-all-trades, midway between scientist and magician. Like his primitive counterpart the bricoleur-artist is one who tinkers with the culture's problems, its debris and discarded artifacts to see, if in a different assembling, they may not be made to work. Not to work as originally intended, which were failures in any case, but to work in some other fashion. The scientist looks for the perfect symmetry where one equals one; the magician longs for an asymmetric universe where lead equals gold; the bricoleur is only interested in making-do, to have "this" equal "that"....

...A spanish philosopher had predicted that art would some day run its natural course, resulting finally in the production of objects of no trancendent worth, acts of irony - an art that is sheer play. This is the art of Peter Chamberlain. Henry Raleigh

Peter Chamberlain

"Buffer Image by Dave Beaty"

"Photo by Jan Kather"

When I was about 13, I tried to make a rotating speaker system for my rock 'n roll organ. I tore 8 speakers out of some old radios and attached them to a cross made of angle iron. I wired up two large washers as a spring-friction contact and attached the whole assembly to a washing machine motor. When I turned it on, the speakers flew off and smashed half the windows in the garage. My love/hate relationship with electronic arts hasn't changed much since... nor has my do-it-yourself attitude or my improvisational curiosity...

Of the artists involved in this show, I have, by far, the least experience with designing electronics, but I have hacked out a lot of electro-acoustic devices.

The G.R.I.D. exhibition finds me working in collaboration with Curt Dunnam, a close friend of 15 years, who I consider to be a true mad-genius electronic wizard. Our collaborative, long-term goal is to produce programmable and modular automatons with a high level of intelligence and complex personalities. The works in G.R.I.D. are actually prototypes that will probably be more interesting as absurd animated objects than as digital wonders.

Throughout my meanderings in the loosely defined areas of sound-sculpture, performance art, electronic music, improvisational structures, straight sculpture, straight music, and video, I have maintained common factors.

I am interested in improvisation, in letting things happen during interactions between myself and materials, tools, or electronic systems.

It is a challenge to bestow personality on a static object. I do that well, but I don't really "install" the personality. Rather, I work in a way that invokes static animation. It would seem that any object with locomotive and audial qualities would be guaranteed a personality. I won't try to give a robot a personality; its personality will simply happen. That's magic. It's time for some robots. I'm interested in objects that do things. I'm interested in magic.

Elmira, NY 1986

