May 28, 1992

Donald E. McCarthur c/o ETC

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He wit have at

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We are writing to confirm your verbal permission to reprint the following manuscript:

Yalkut, Jud. Excerpts from "PART THREE: OPEN CIRCUITS: The New Video Abstractionists" from unpublished book manuscript ELECTRONIC ZEN: The Alternate Video Generation. 1984.

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Judson Rosebush

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Rosebush, Judson. "The Moog Synthesizer: An Interview with Its Inventor." Syracuse New Times (February 17, 1972).

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Dan Sandin & Phil Morton

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We are writing to confirm your permission to "copy it right":

Sandin, Daniel J. and Phil Morton. "Distribution Religion." Chicago: University of Illinois at Chicago Circle, ca. 1972.

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Lee Harrison

Dear Lee,

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Harrison, Lee. Notes for an Animation Device. 1961. Photocopy.

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Tom DeWitt

Dear Tom,

We are writing to confirm your verbal permission to reprint the following manuscript:

DeWitt, Tom. Proposal for a video synthesizer. Typescript. 1975.

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Glenn Southworth

Dear Glenn,

We are writing to confirm your verbal permission to reprint the following manuscript:

Colorado Video, Inc. "Instruments for Video Art." Boulder, Colorado. Undated.

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## **Catalog Contents**

1. Introduction by Peter Weibel

2. Curatorial Statement by Woody Vasulka

3. A History of Electronic Music Pioneers by David Dunn (with bar codes correlated to 150 images and 53 sound examples on laser disc)

4. Video: State of the Art by Johanna Gill (with bar codes correlated to still and moving images on laser disc)

5. Descriptions of Tools and Designers (includes 80 pages of photos, diagrams, bios, interviews and bar codes correlated to laser discs about the tools on exhibit)

6. Installations (descriptions of installations on exhibit)

7. Tape List (list of videos to be exhibited)

8. The Form and Sense of Video by Robert Arn

9. Image Processing and Video Synthesis by Stephen Beck

10. Video Synthesis by Tom Dewitt

11. Space-Time Dynamics in Video Feedback by James Crutchfield

12. Notes on an Early Animation Device by Lee Harrison

13. Experimental Television Center Processing Manual



Dziga Vertov's Kino Pravda

Television is no more like film than Punch and Judy is like theater. Sadly, broadcast television presents us with the spectacle of Punch dropping his brickbat and delivering Hamlet's soliloquy. No wonder the audience turns away in boredom. Each art has its own formal necessities which it ignores at peril. Film was boring while it imitated the conventions of the proscenium arch stage; and television remains trivial while it imitates film. Artists and innovators signal their break with such trivial use of television by calling their uses "video." Video rejects the conventions of both film and broadcast television and attempts to discover the unique formal necessities of its electronic processes. Video is finding the conventions suitable to such necessities; and we now have an electronic visual art form to mplement electronic music – Video Art.

## The form and sense of video

ROBERT ARN

How then, if formal characteristics are so important, are we to explain the assumption that television is like film? Or the almost total absence, after more than 20 years, of formal descriptions of the television process? The answers are mostly to be found in economic and social rather than artistic history and need not concern us here. The fact remains that to date, television both in production and viewing has been dominated by the conventions and assumptions of narrative film. It is criticized in terms of content of the crudest narrative or logical type. Which is odd, since very few who regard television in this limited way would chance interpreting film purely in terms of the narrative conventions of the novel.

From the first, film has been perceived actically, critically, and theoretically by those whose interest is primarily narrative or contentrelated, or by those who see its process as opening new forms of perception to the audience and thus new fields of expression to the artist. But of course film did not suffer from a flight of intellectuals at its birth. Born in the Constructivist period of technological optimism, it was immediately the focus of intellectual attention, while television even now faces a technological paranoia which has blocked serious conceptual study of its formal characteristics and has thus enforced an *artistic* triviality as profound as its *social* impact. However, even film criticism is shaky in some of its formal descriptions; some misconceptions about the filmic treatment of time will need to be righted before we can reach an adequate formal description of video (or televisionas-an-art-form).

In 1924 film was new and fascinated with itself. Dziga Vertov, out with his camera endlessly walking, created *Man With a Movie Camera* and revealed the new possibilities open to man's cinextended perception. He called this mechanically extended perception "cine eye." Through his viewfinder Vertov saw space expand and contract and perspective shift with

Carol Parts Lipraria at Canoda Convert for the arts : acc / 224 - 33414

Video camera from Michael Snow's Timed Images



## SPACE-TIME DYNAMICS IN VIDEO FEEDBACK

### James P. CRUTCHFIELD\*

Center for Nonlinear Studies, Los Alamos National Laboratories, Los Alamos, New Mexico 87545, USA

Video feedback provides a readily available experimental system to study complex spatial and temporal dynamics. This article outlines the use and modeling of video feedback systems. It includes a discussion of video physics and proposes two models for video feedback dynamics based on a discrete-time iterated functional equation and on a reaction-diffusion partial differential equation. Color photographs illustrate results from actual video experiments. Digital computer simulations of the models reproduce the basic spatio-temporal dynamics found in the experiments.

## 1. In the beginning there was feedback

Video technology moves visual information from here to there, from camera to TV monitor. What happens, though, if a video camera looks at *its* monitor? The information no longer goes from here to there, but rather round and round the camera-monitor loop. That is video feedback. From this dynamical flow of information some truly startling and beautiful images emerge.

In a very real sense, a video feedback system is a space-time simulator. My intention here is to discuss just what is simulated and I will be implicitly arguing that video feedback is a space-time analog computer. To study the dynamics of this simulator is also to begin to understand a number of other problems in dynamical systems theory [1], iterative image processing [2], cellular automata, and biological morphogenesis, for example. Its ready availability, relative low cost, and fast space-time simulation, make video feedback an almost ideal test bed upon which to develop and extend our appreciation of spatial complexity and dynamical behavior.

Simulation machines have played a very im-

• Permanent address: Physics Department, University of California, Berkeley, California 94720, USA.

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portant role in our current understanding of dynamical behavior [3]. For example, electronic analog computers in their heyday were used extensively to simulate complex behavior that could not be readily calculated by hand. They consist of function modules (integrators, adders, and multipliers) patched together to form electronic feedback networks. An analog computer is set up so that the voltages in different portions of its circuitry evolve analogously to real physical variables. With them one can study the response and dynamics of a system without actually building or, perhaps, destroying it. Electronic analog computers were the essential simulation machines, but they only allow for the simultaneous computation of a relatively few system variables. In contrast, video feedback processes entire images, and does so rapidly. This would require an analog computer of extremely large size. Video systems, however, are not as easily broken down into simple function modules. But it is clear they do simulate some sort of rich dynamical behavior. It now seems appropriate that video feedback take its proper place in the larger endeavor of understanding complex spatial and temporal dynamics.

Cellular automata are the simplest models available for this type of complexity. Their study, however, requires rapid simulation and the ability

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May 15, 1992

Johanna Gill Branson Massachusetts College of Art Boston, MA Fax: 617/566-4034

Dear Johanna,

We are writing to confirm permission to reprint the following article:

Branson, Johanna Gill. "Video: State of the Art." Working Papers. New York: The Rockefeller Foundation, 1976.

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