



FILM



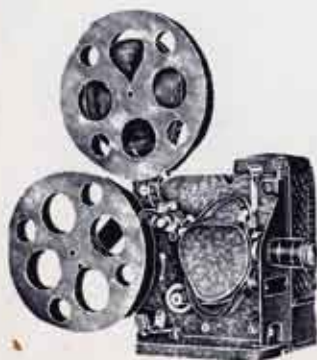
FROM
STAN VANDERBEEK
GATE HILL RD.
STONY POINT, N. Y.

914....Ha 98604.....

POEMFIELD #L

POEMFIELD

GESTURES
DO NOT
MISTAKE
PLACE
YET.....
FINGER POINTING
TAKES A WORD TO COMPLETE
SOME HOW
WORDS
FILL
THE SPACE BETWEEN
BETTER
MEANING
MOVES
POSITION
LOVES
FINGER
DIRECTS
SPEECH
THAT
SILENCE
FALLING
TOUCHES
THE END





FILM S

FROM

STAN VANDERBEEK

GATE HILL RD.

STONY POINT, N. Y.

914....Ha 98604.....

POEMFIELD # 2

SIMILIAR
LIKE
TO
CLOCK
TICK
WE PICK
LIFE
OUT
OR APART
SEEMING
TO SEE
SEPARATE
THINGS
TOGETHER
SO
YOU
SAY
IT
WOULD
SEEM
LIFE LIKE
THIS
LIVING
BUT
WE
ALWAYS
SUSPECT
IT

THE END
POEMFIELD#2
A STUDY
IN COMPUTER
GRAPHICS
BY STAN VANDERBEEK
AND KEN KNOWLTON





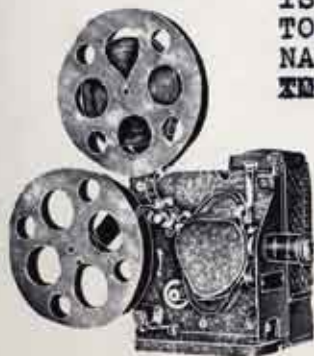
FILM S

FROM
STAN VANDERBEEK
GATE HILL RD.
STONY POINT, N. Y.

914....Ha 98604.....

CompuTbn
pOEmS

PO
POE
POEM
FIE
FIELD
POEMMM
FIELD NO 3
POEMFIELD NO 3
NO 3
A MAP OF IDEAS
A
VOICE
WRONG
A WHEEL
WRONG
AWHEEEEEEL
A WHEEL
BUT NOT REALLY
A HAND
REALLY
MEMORY
MEMORY IS A TIGHT
IS A TIGHT ROPE
A FIRE
AIEEEEE
CRYING IS AN EDGE
NOT OVER
LOOKING
BUT A CUTTING EDGE
REALLY
THE DARK
THE DARK IS A QUESTION
I BELIEVE YOU
NAKED
IS LIKE
TOMORROW
NAKED IS
~~TOMORROW~~ LIKE TOMORROW



PoemField #4

OLD

OR OROR OR

POP POP POP

FOR FOR

FORM FORM FORM

FILM FILM

NO, 1

POEMFIELD 4

FALLING WORDS

AS LEAVES

FALLING

SPEACH REACH

ON AND OFF

LIFE FORMS

WORDS

YES AND

YES AND NO

GONOGO

GOING

ON

GONE

ONE

ON

NO

GO

NO

GO

NO

GO

NO

Poem field #5

fall

FALLING

ALL

FALLING

FOR FALLING

OR ALL FOR

FAR

FOR

FAR

MAN

FOR MANS KIND

FALL

MANS PLAN

WAITS

WAITING

WITS

WITNESS

MAN

FITS

WITNESS

WIT

INTO OTHER WIT

AS IF WIT KNOTS WIT

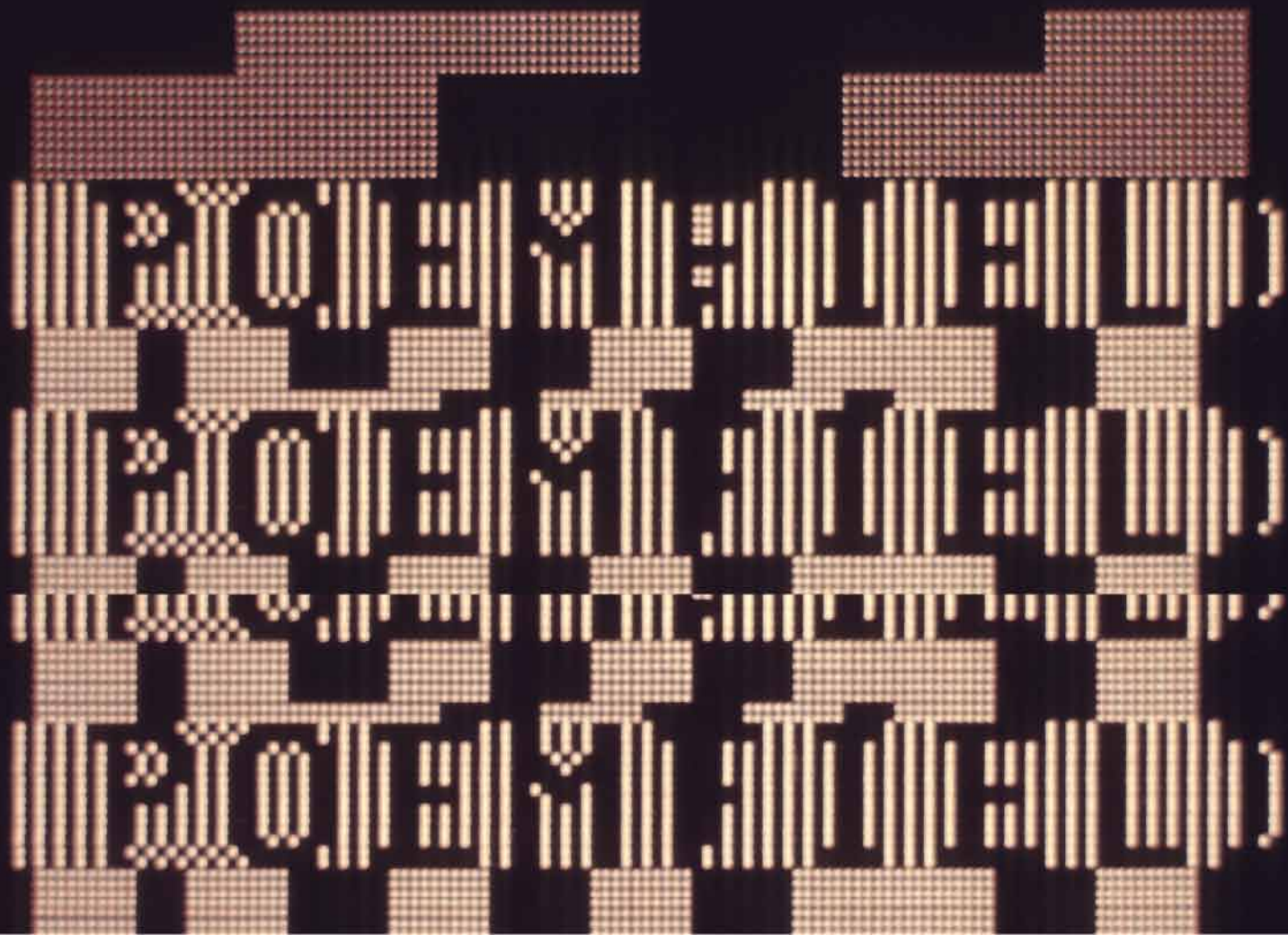
WHILE WAITING

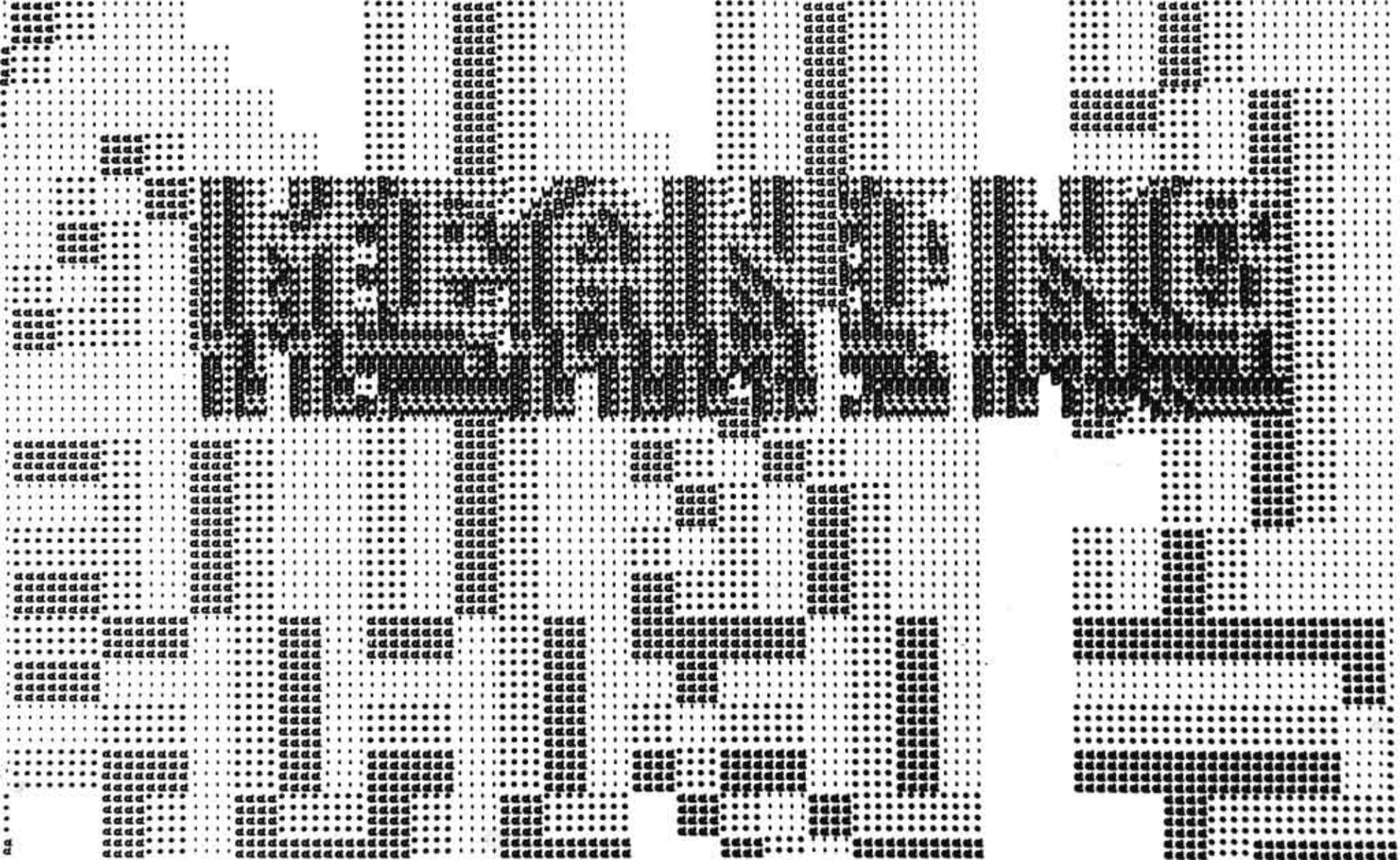
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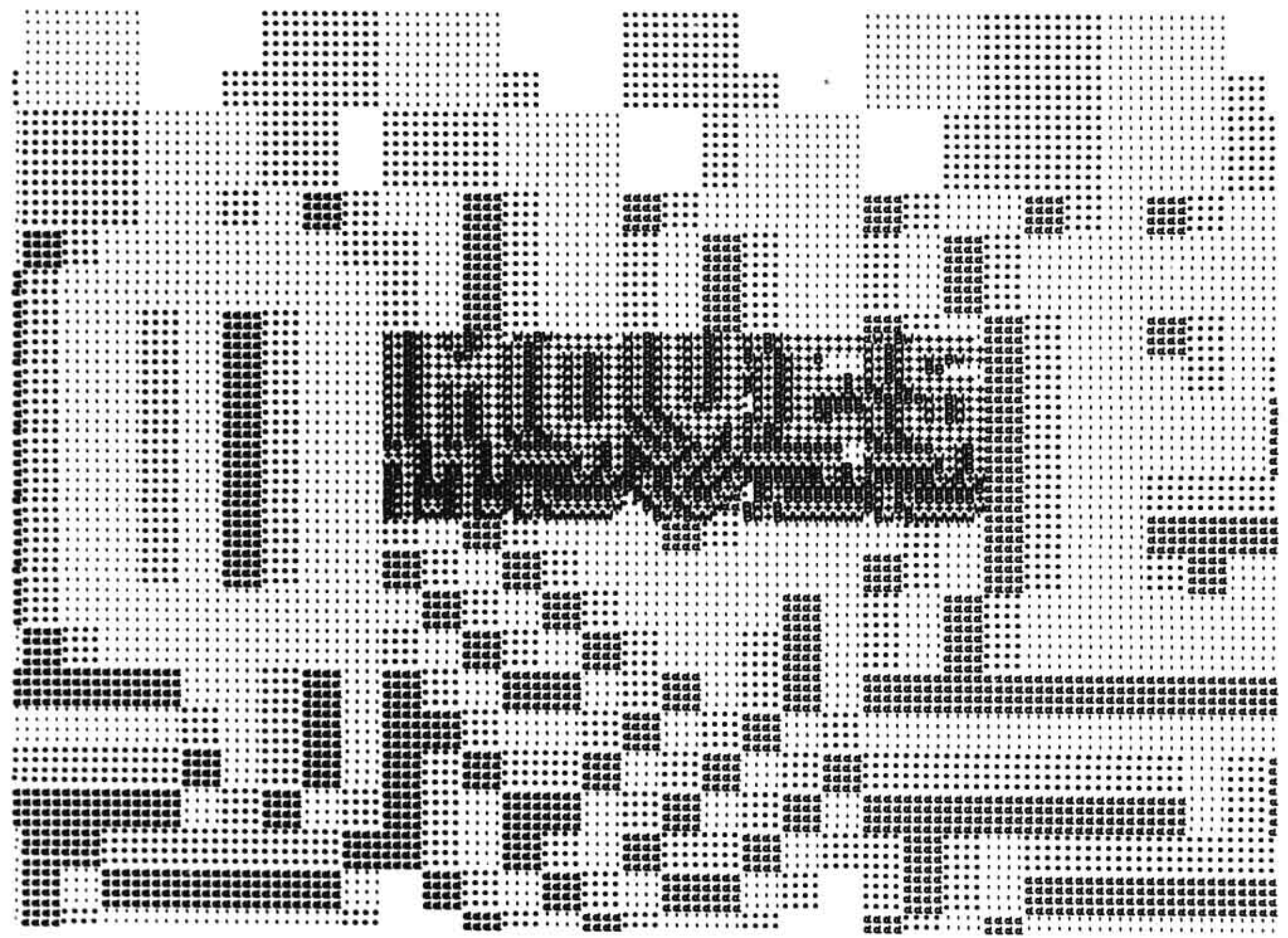
WHILE FALLING

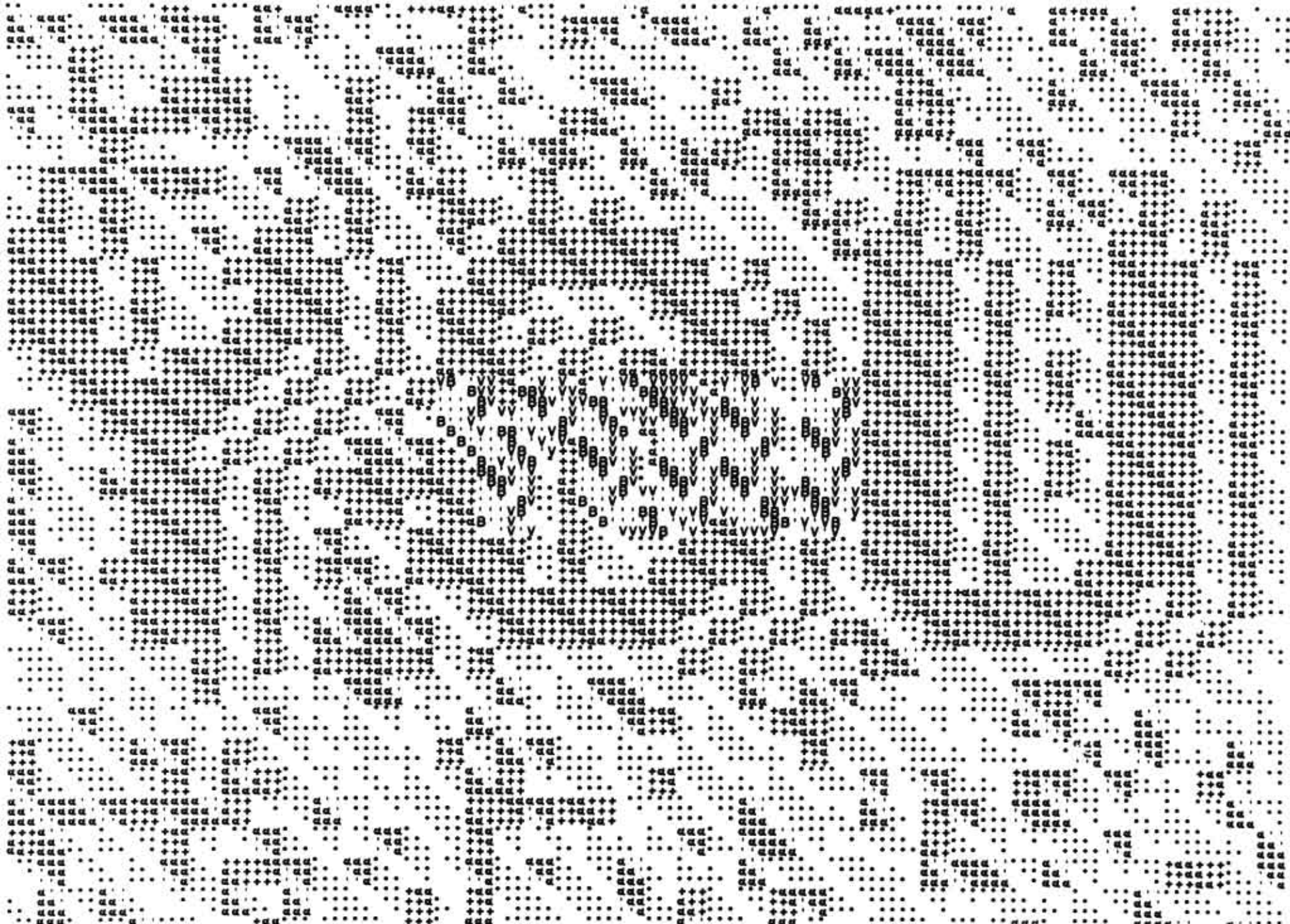
FREE

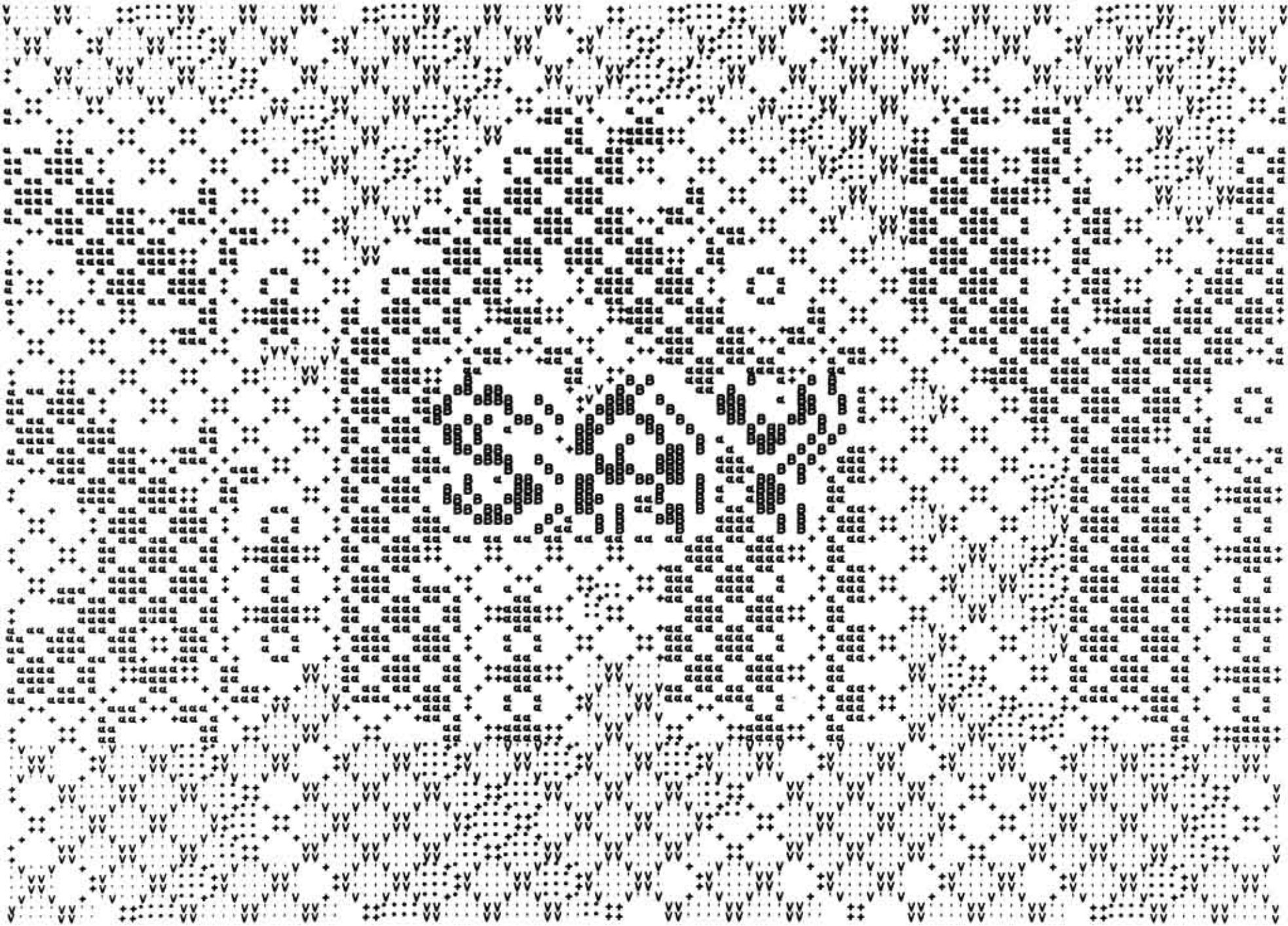
FREE FALL

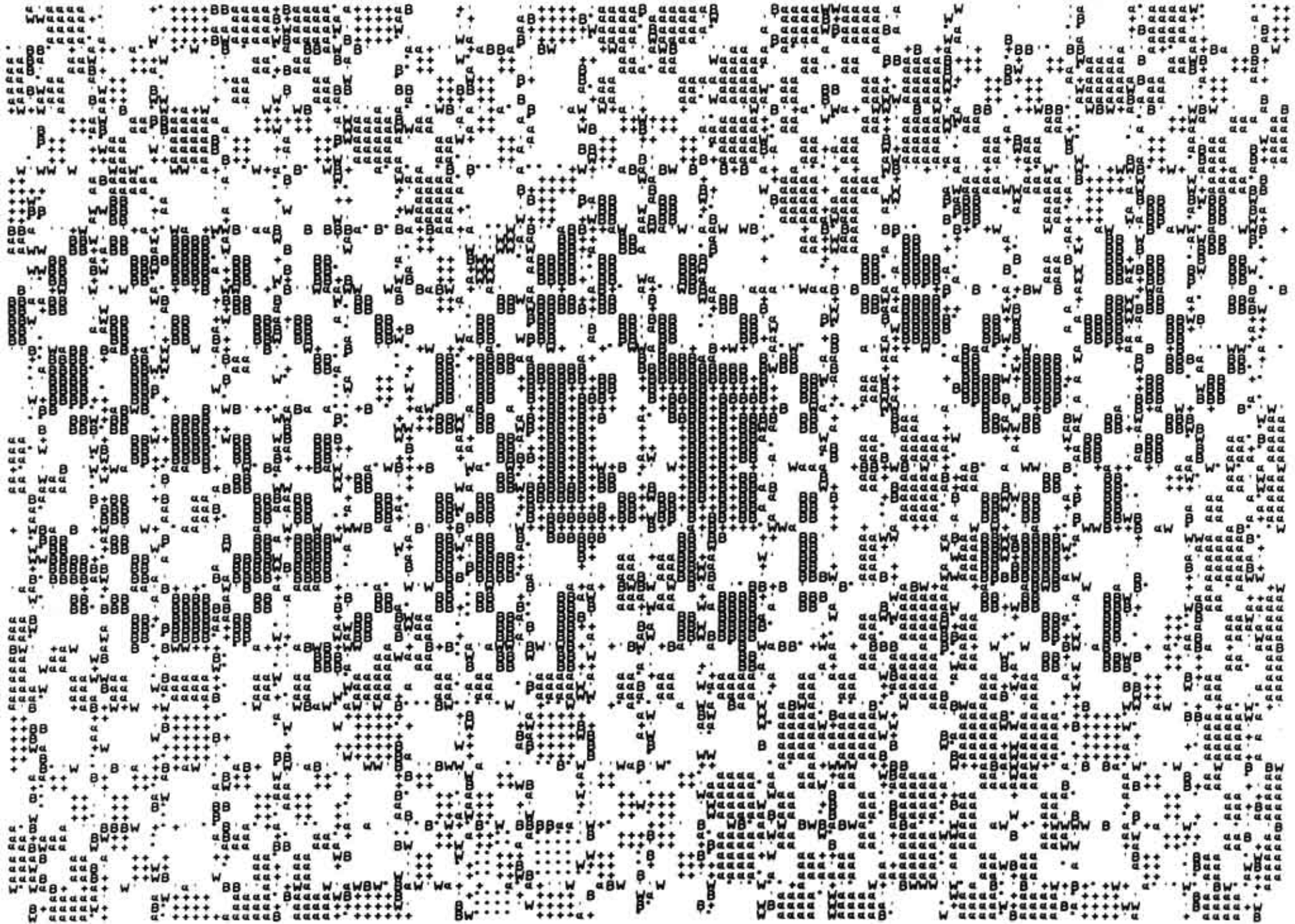


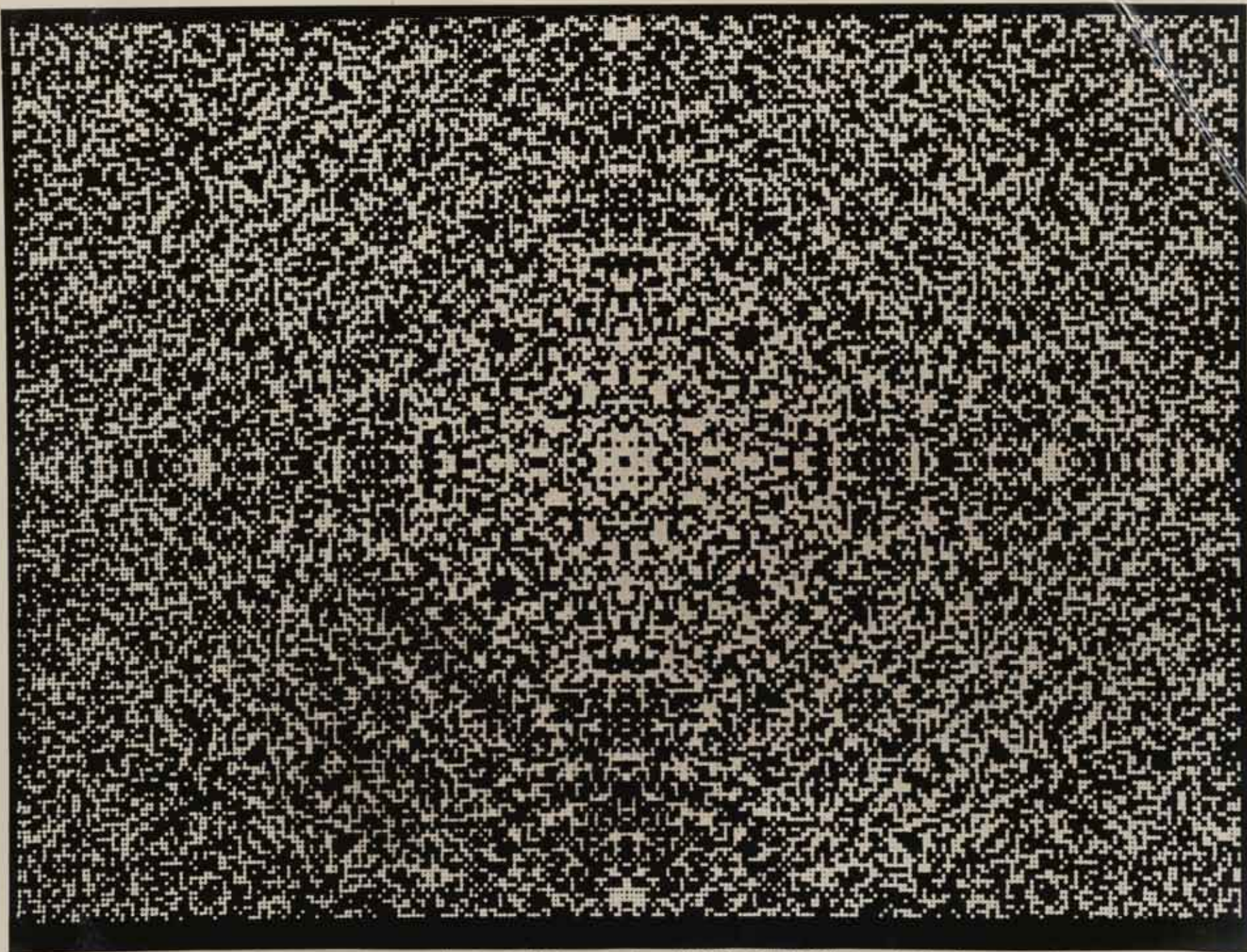




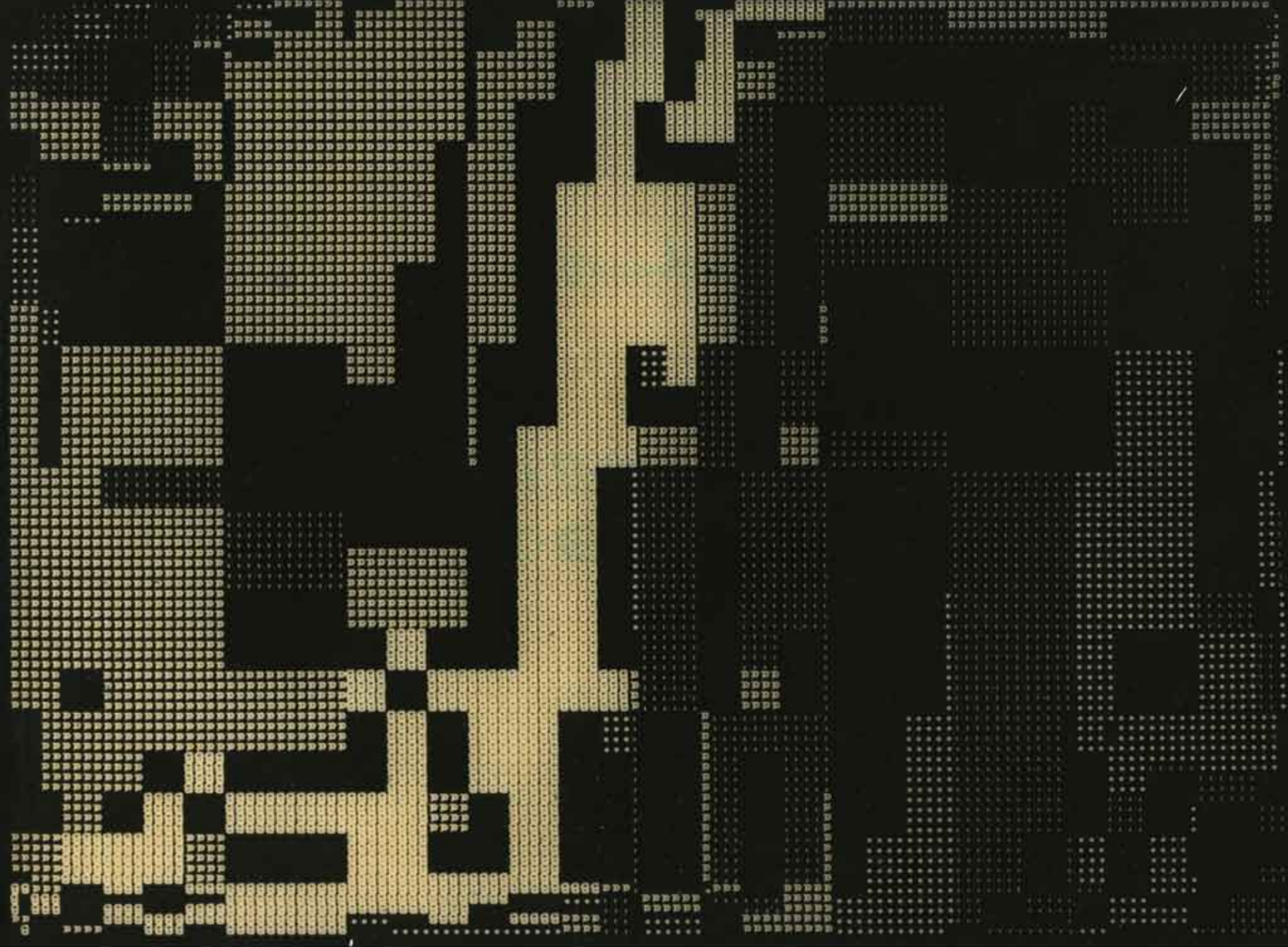




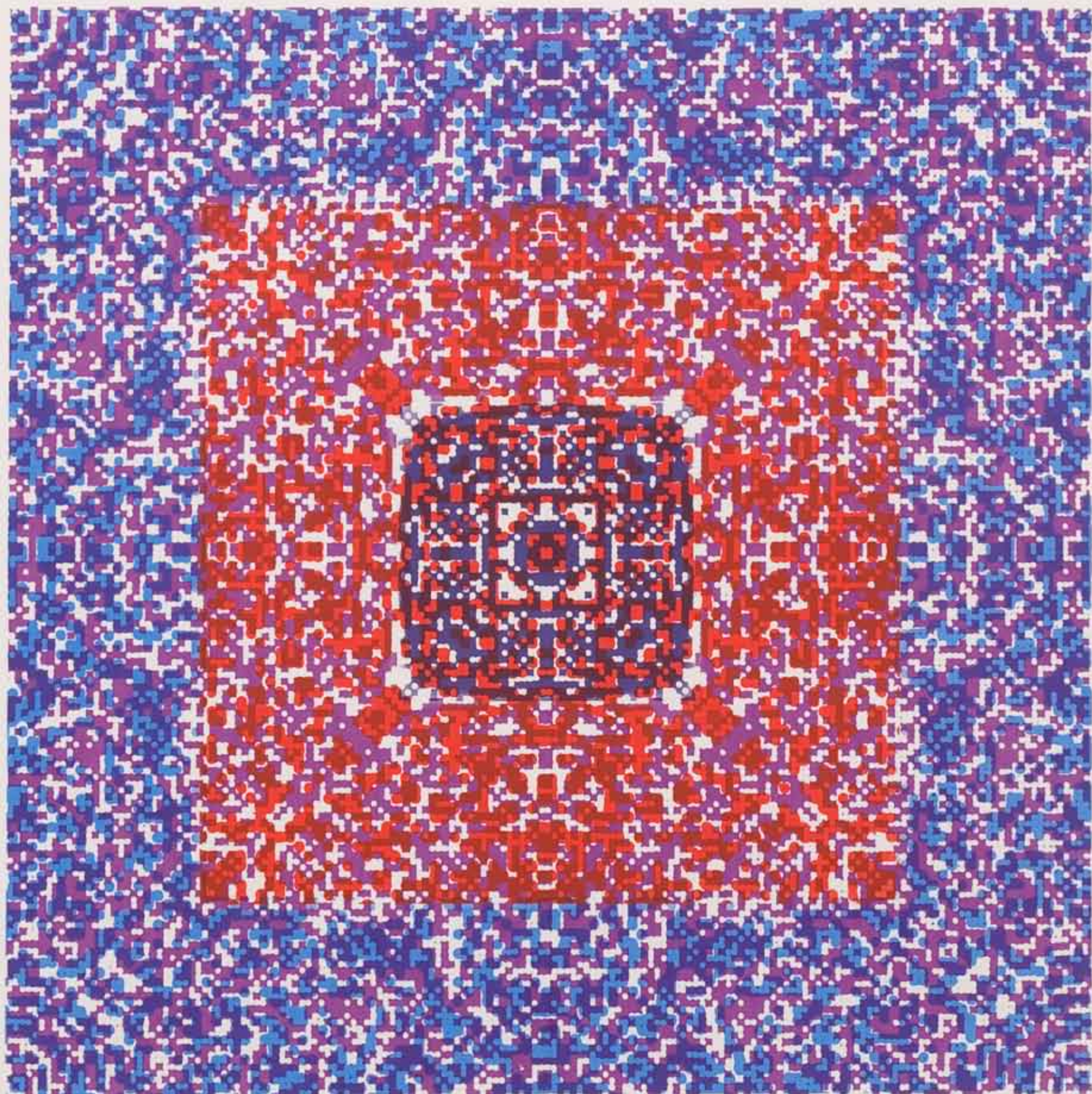




A frame from the computer animated film series "POEM:FIELDS", a study in computer generated images, combining text and fast moving patterns realized by S.VanDerBeek and Ken Knowlton c 1971 by S.VanDerBeek Productions, Gate Hill Rd, Stony Point, N.Y.

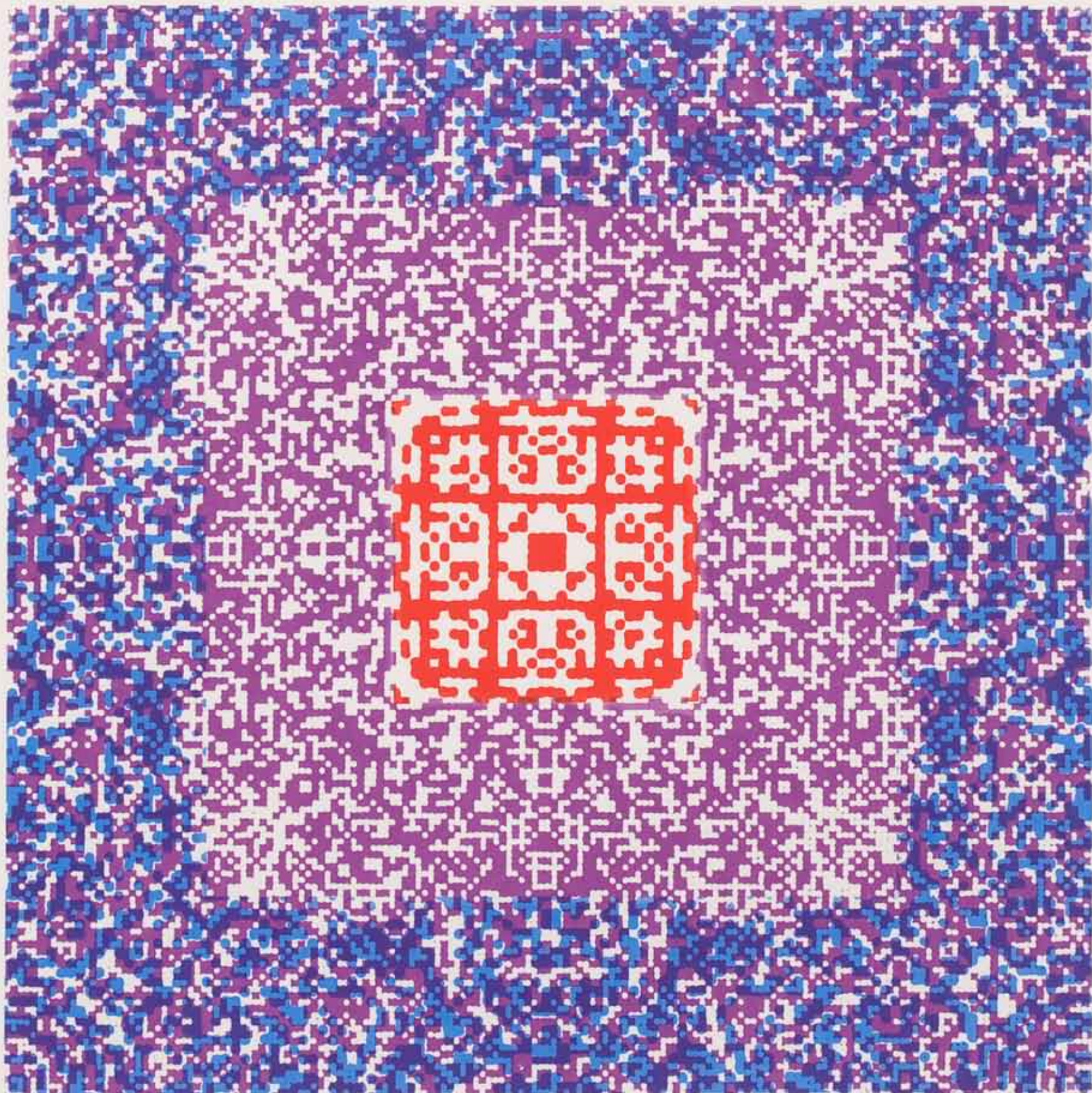






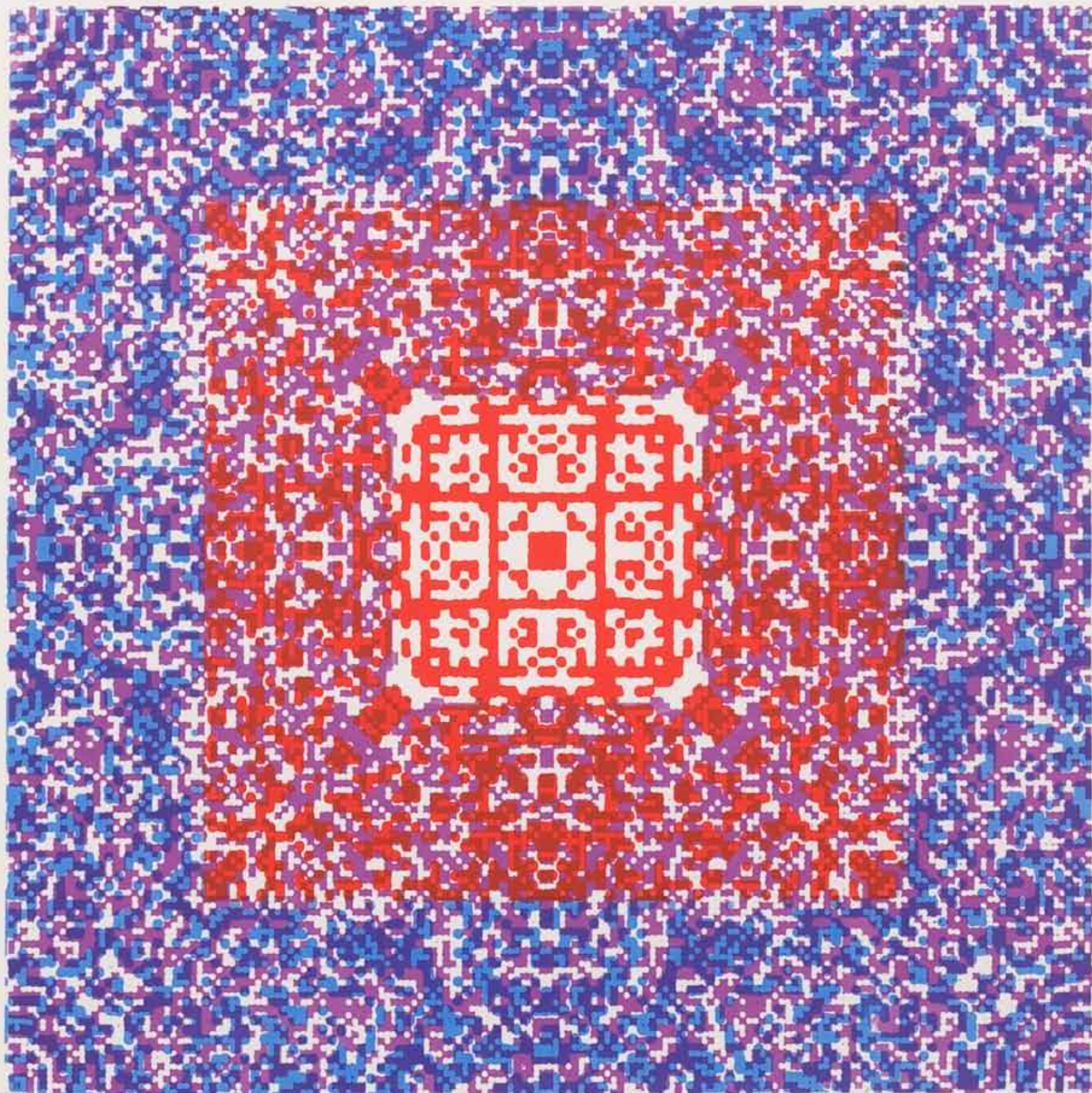
20/20 pattern/RS #3

A. VANDERBEEK - 73



20/30 MANDOK/AS #2

D. LINDENBERG 73



20/20 MANDALAY #1

10 PANDORA #3



エクスパンデッド・シネマの 作家——ヴァンダービーグ 東野芳明

Stan VanDerBeek,
wizard of expanded cinema
Tono yoshiaki



マルチ・プロジェクションが流行しだしたのはいつ頃からだったろうか。草月アート・センター主催のシンポジウム〈何かいってこれ、いま探す〉や、大ディスコテーク〈MUGEN〉の開店などがひとつの話題となったし、来年の万国博では、相当に使われることが予想される。これは、われわれの社会や生活が、多重像の複数の焦点をもち、たえず変動していることの必然的なあらわれであって、いまでは、スクリーン1枚の上に映写される映画は、油絵1点をじっと見つめると同じ様に、古典的な芸術の領域に入りこんでしまっている。しかし、いまのマルチ・プロジェクションの流行には、なんでも2,3枚のスクリーンに、多重的にイメージを映せば事足りるといった安易な風潮が強い。しかし、本来、映画の自壊と展開、異質なメディアの共存、さまざまな情報の爆発的な増大、同時的なコミュニケーションの発達などの複雑な要因が絡み合って、必然的にマルチ・プロジェクションが発生しているとすれば、それらを作る、というより、提示する作家の内側に、まず深い必然性と認識があるべきなのは当然だろう。これは単に、面白おかしい、新手法ではないのである。

今年の〈クロス・トーク・インターメディア〉のために来日した〈エクスパンデッド・シネマ〉の作家スタン・

ヴァンダービーグは、このマルチ・プロジェクションの精髓を見せてくれた。代々木の第二国立競技場の、彎曲した曲面のドームこそ、この〈ムーヴィ・ドローーム〉の作家にはうってつけの場であった。〈ムーヴィ・ドローーム〉というのは、球形のドームの中で、さまざまな映像が、ドーム状のスクリーンに同時上映されるものであって、観客はドームの全体を見渡せるように、ドームの中心に向かって足を投げ出して外側の縁に横になって見るのである。作者はこう言っている。〈観客は上演から吸収出来るもの、あるいは吸収したいものを吸収し……観客自身の結論を引き出す……観客の一人一人がイメージの流れから自分自身の『関係づけ』を積み重ねてゆく。視覚的な資料の提示は、提示という言葉の最善の意味でのそれであるべきで、各自がそれぞれの結論、あるいは認識を引き出す〉。

〈クロス・トーク・インターメディア〉では、技術的な制約もあってか、ドーム状のスクリーンの代りに、8枚のパネルが使用され、それを運ぶ人間によって動くようになっていた。映写されたのは『ボエム・フィールド』などの7本の作品で、スクリーンがもそもそ動きながらまるで映像とスクリーンを運ぶ人間との追いかっけのような感を呈したのはユーモラスだった。『ボエム・フィ

ールド』はアルファベットを使った〈コンピューター・グラフィック〉をほかの映像と結びつけたもので、手仕事の趣味性や個性という限界をこえて、コンピューターが未開拓のグラフィックの可能性を強烈に暗示したものである。また、草月会館の地下劇場での〈エクスパンデッド・シネマ〉は3つのスクリーンに同時映写された。われわれは現在、映像の過剰、情報過多の時代に生きているのだが、そこでは、ヴァンダービーグのいうように〈観客自身の結論を引き出す〉こと、つまりは、受け身になって映像の過剰の中に埋没するのではなく、積極的に情報や映像を、激しく攪きとってゆくことが大切なのである。

1 コラージュ「ドーム下に封じられた都市の提案」

2 スタン・ヴァンダービーグ
ニューヨーク近郊ストーニー・ポイントにある
自宅のムービー・ドローーム（映写ドーム）にて

1 collage "Cities Sealed Under Domes Proposed"
2 Stan VanDerBeek at his "movie-drome" (Stony Point, N.Y.)
photo: Richard Raderman

When did multi-projection begin to be popular? I recall that there was much interest in the symposium sponsored by the Sogetsu Art Center and in the opening of the discotheque Mugen, and multiprojection is expected to be used extensively at EXPO 70 next year. This is a necessary reflection of the constant transformations and many multiple-image foci in our lives today. A film projected on a single screen today belongs to classical art, just in the same way as the act of contemplating a single painting. However, in the vogue of multi-projection one senses a certain facile approach: one tends to be satisfied simply as long as different images are projected onto two or three different screens. However, multi-projection was originally called into being as the necessary result of a concatenation of many complicated factors: the breakdown of the cinema, the coexistence of heterogeneous media, the information explosion, the development of simultaneous communications. Thus, it is only natural that there ought to be a profound sense of necessity on the part of the creating, or rather displaying artist. This is not merely a novel method of "fun" entertainment.

Stan VanDerBeek, the "expanded cinema" artist who came to Japan for this year's Cross Talk Intermedia, showed us the quintessence of multi-projection. The curved dome of the Yoyogi National Stadium was an ideal site for VanDerBeek, the originator of the "Movie-

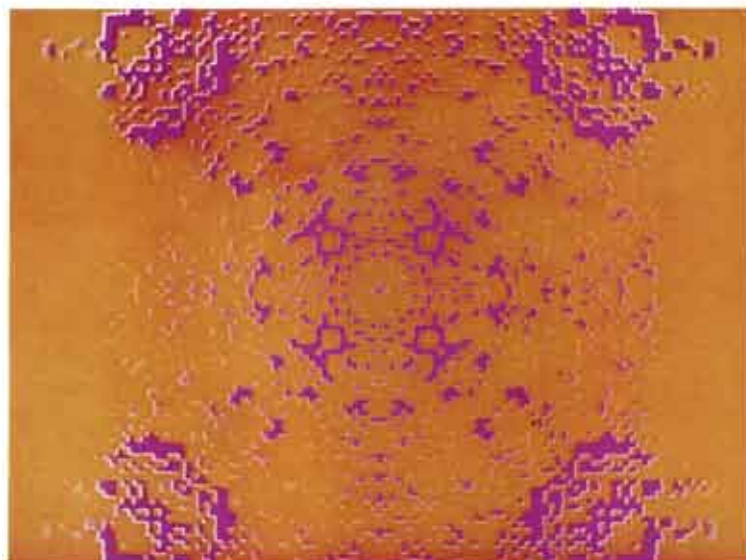
Drome." In the "Movie-Drome," simultaneous images of all sorts are projected on a spherical dome-screen. The spectators lie down at the outer edge of the dome with their feet towards the center; they command a view of almost the entire dome-screen. VanDerBeek tells us that "the audience takes what it can or wants from the presentation...and makes its own conclusions...each member of the audience will build his own references from the image-flow, in the best sense of the word the visual material is to be presented and each individual makes his own conclusions...or realizations."

At Cross Talk Intermedia, probably because of technical limitations, eight panels were used instead of the dome-screen, and the panels were moved around by porters. Seven films were projected, including "Poem Fields." As the screens moved around, it was humorous to watch what appeared to be a race between the images and the porters carrying the screens around. In "Poem Fields," computer graphics using letters of the alphabet was combined with other types of images. In this work, there was a powerful indication of the as-yet undeveloped potentialities of computer graphics, far surpassing the limitations of handiwork amateurism and individuality. At the "expanded cinema" presented at the Sogetsu Hall, films were projected simultaneously onto three screens. We live today in an age of excess image flow and of

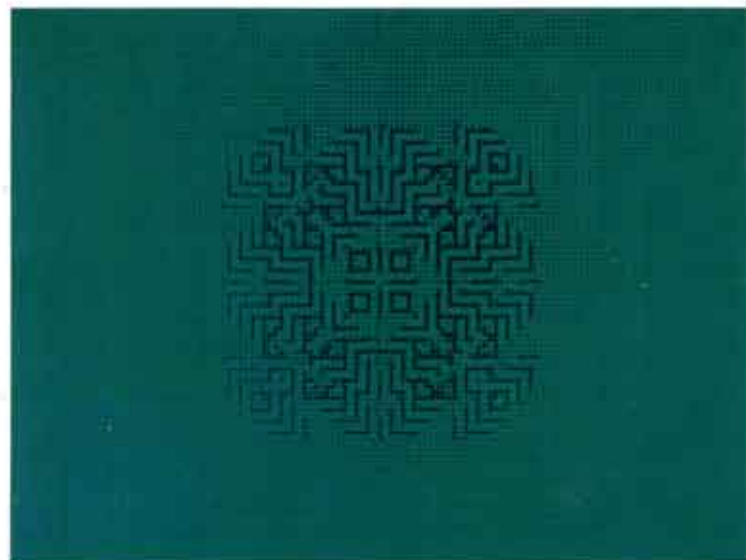
overcommunication. This is why it is so important for the "audience to make its own conclusions," as VanDerBeek puts it. In other words, rather than being submerged in the excessive flow of images, the audience positively, ardently selects its own information and images.

- 3 映画小中「デザイン・イン」の内部
- 4 ムービー・ドーム
- 5 ニューヨーク中央公園における「デザイン・イン」
- 6-21 コンピューター・フィルム
- 共作 K・ノールトン 色紙 ブラウニング・セグウェイ
- 6-8・14-16 「ボナム・フィールド」第3 1964-69
- 1968年リンカーン・センター映画祭アニメーション部門1位入賞
- 9-11 「ボナム・フィールド」第1 1966
- 12・13 「コライド・スコープ」1966
- 17-19 「ボナム・フィールド」第4 1966-69
- 20・21 「ボナム・フィールド」第5 1966-69
- 3・5 "Design-In," Central Park in New York photo. Richard Raderman
- 4 "Movie Drome," Stony Point, N.Y.
- 6-21 studies in computer graphics by S. VanDerBeek and K. Knowlton, colorized by Brown-Olvey
- 6-8・14-16 "Poem Field No. 3," 1964-69
- First Prize in Animation Lincoln Center Film Festival, 1968
- 9-11 "Poem Field No. 1," 1966
- 12・13 "Collide-oscope," 1966
- 17-19 "Poem Field No. 4," 1966-69
- 20・21 "Poem Field No. 5," 1966-69

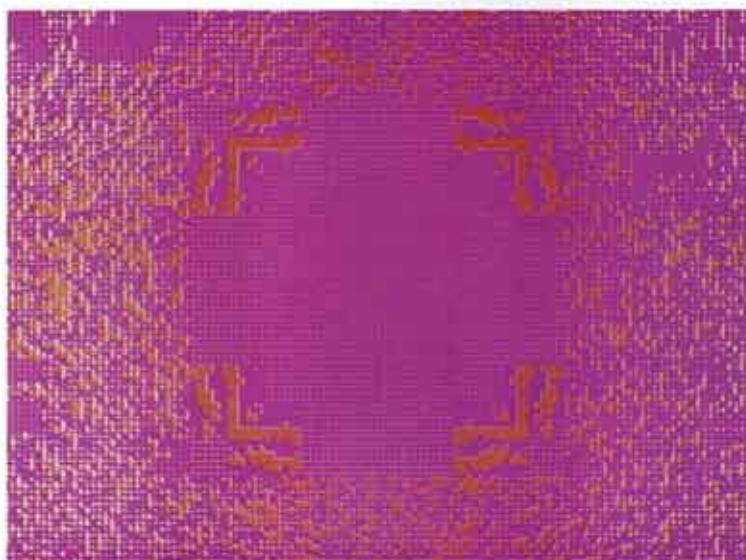




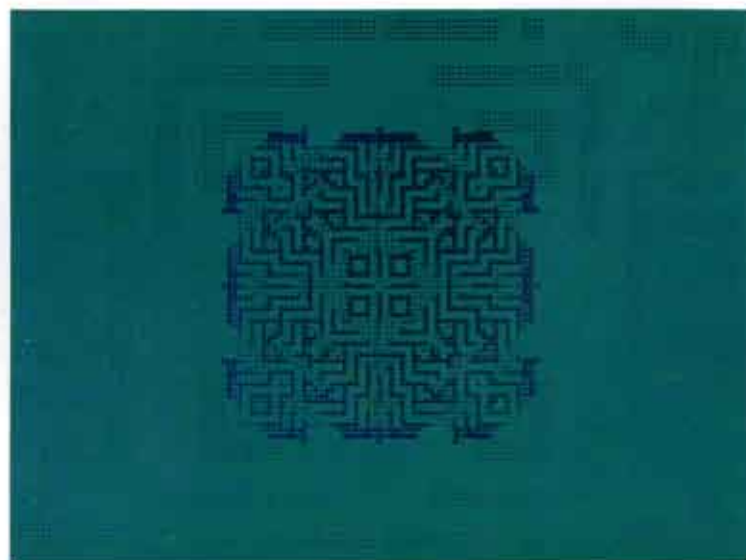
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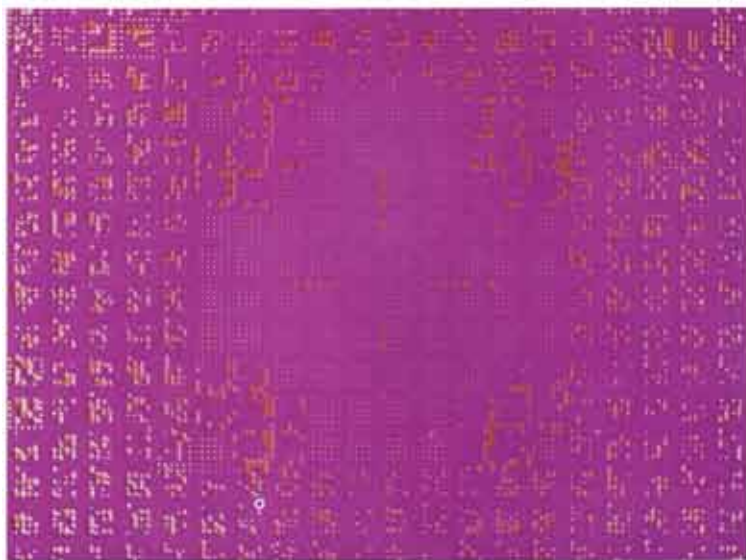
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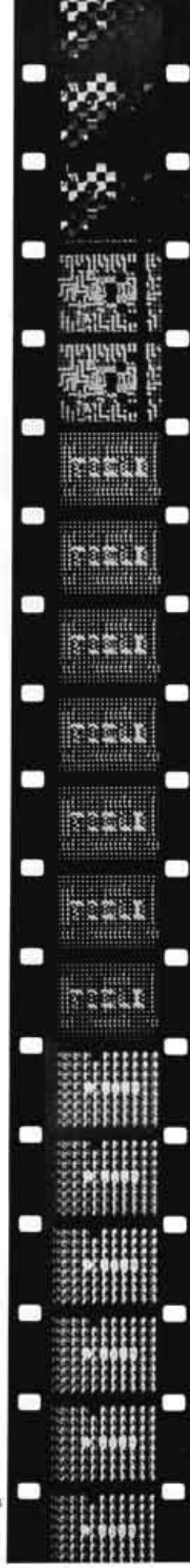
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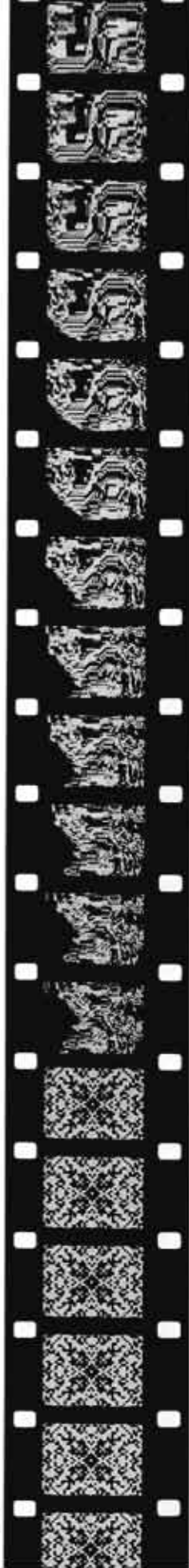


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11





22・23 <イメージ・アフター・イメージ> 1967-69

色彩 ブラウン・オーグ・イ

24・25 <サイエンス・フィクション> 1958

1960年ニューヨーク市創作映画基金特別賞受賞

1961年オーバーハウゼン映画祭アニメーション部門第1位入賞

26 コラージュ

27 映画 <プレス・デス> 1964

28 映画 <イニット> 1960

22・23 "Image after Image," 1967-69

colorized by Brown-Olvey

24・25 "Science Fiction," 1958

Award of Distinction Creative Film Foundation, N.Y.C., 1960

First Prize in Animation

Oberhausen Film Festival, Germany, 1961

26 collage

27 film "Breathdeath," 1964

28 film "Yet," 1960



22



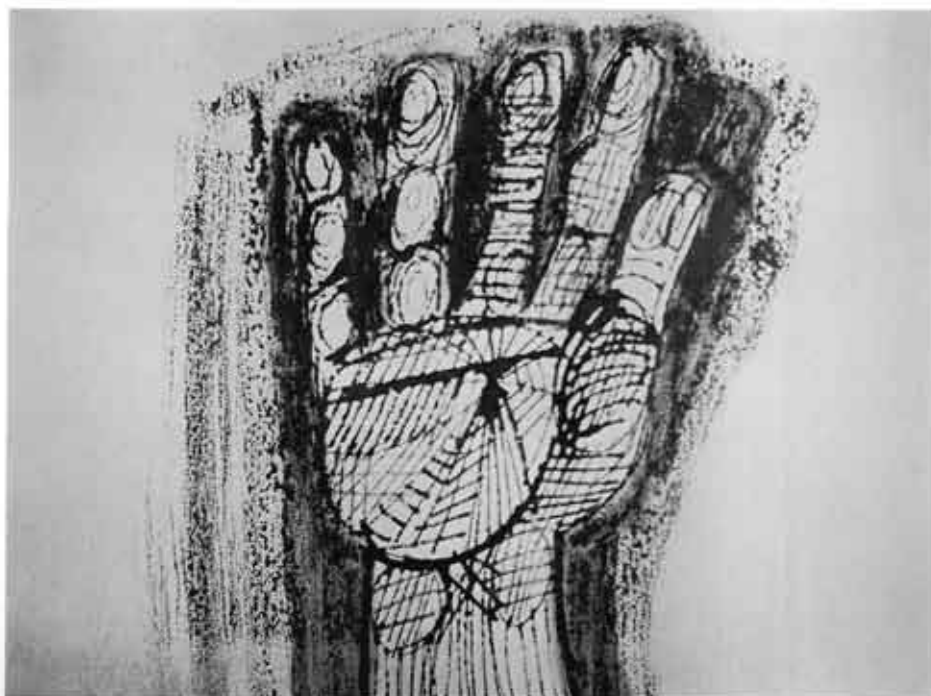
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27



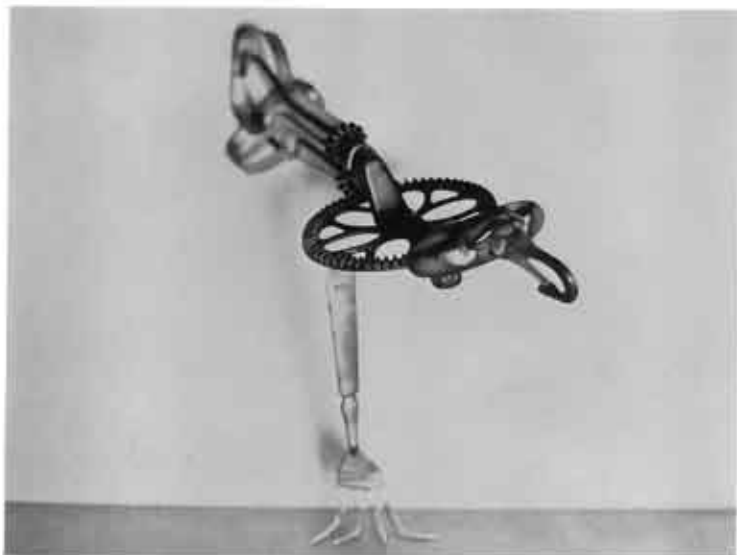
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29



30



31



32

29 映画《何を誰がどのように》1957

1958年 ブリュッセル万国博覧会実験映画コンクール青銅賞受賞

1959年 ニューヨーク市創作映画基金金賞受賞

1965年 ニューヨーク近代美術館のコレクションに収録される

30 映画《シー・ソー・シムズ》1965

31・32 《知恵い Spoon たちのダンス》1959

29 film "What Who How," 1957

Bronze Medal, Brussels International Experimental Film

Competition, Brussels World Fair, 1958

Award of Merit, Creative Film Foundation, New York, 1959

In the collection of the Museum of Modern Art, New York, 1965

30 film "See, Saw, Seams," 1965

31・32 film "Dance of the Looney Spoons," 1959

Residence: Gate Hill Co-op, Stony Point, N.Y.
10980

Phone 914 947-1604

Work address in NYC

c/o Si Fried Productions,

49 West 45th St. 212 PL7- 4424

Born N.Y.C....studied painting and graphics at Cooper Union Art School in NYC 1952, Black Mt. College 1953, Ford Foundation Grant for experimental films 1963-4, Rockefeller Grant for experimental films and studies in non-verbal communication 1967-8. Associate Professor at Columbia University 1963-5 animation and film production. Associate Professor at New York State University at Stony Brook, film project 1967-8. M.I.T. Center for Advanced Visual Studies 1969-70 Fellowship. Associate Professor of Film making University of St. Thomas Media Center, Summer 1968. Associate Professor of Film making University of Washington, Seattle 1968.

Various projects include the construction of the "Movie-Drome" in Stony Point, NY an audio-visual laboratory for simultaneous projection of dance, magic theatre, sound, and film. Computer-Graphics: the development of images and graphics designed by man-machine dialogue. Animation and new graphics, projection systems, multi-media: integrated information concerts, movie-murals experiments with motion/light/stills/film/magic theatre.

Bronze Medal "Mankinda" and "What Who How,"
1958 Brussels International Experimental
Film Competition, Brussels World Fair

Award of Merit, "What Who How," 1959

Creative Film Foundation, NYC

Participant Venice Film Festival, 1959

Award of Distinction, "Science Friction," 1960,

Creative Film Foundation

First Prize in Animation, "Science Friction," 1961,

Oberhausen Film Festival Germany

First Prize in Animation "Mankinda," 1961,

Bergamo Film Festival, Italy

First Prize in Animation, "Summit," 1963,

Manheim

"Skullduggery," Lincoln Center Film Festival 1964

"Skullduggery," London Film Festival 1964

2nd Prize, "Man and His World," Computer film
Expo 1967

"See, Saw, Seams," Lincoln Center Film Festival
1967 and London Film Fest.

Interview and participant in "Literarisches
Colloquium," Berlin, 1965

C.B.S. 1968-Camera 3

20th Century-1968

First Prize in Animation, "Superimposition," 1968,
Manheim Germany

Lincoln Center Film Festival, 1968 "Poemfield

#3", 1968

Publication of Articles includes:

Film Culture, winter 1960, 1962, 1964, 1965

Film Quarterly, summer 1961;

Popular Photography, Sept. 1965;

Tulane Drama Review, 1965;

American Scholar, 1966;

Art in America 1969

Guest lectures and screenings at colleges:

Cornell, Dartmouth, Harvard, MIT, Miami U,

Michigan State, Ohio State, Princeton,

Rhode Island School of Design,

San Francisco State College, Syracuse,

University of Cincinnati, U.C.L.A. Yale, NYU,

U. of Oklahoma, U. of Iowa, U. of North Carolina,

U. of Southern Fla.,

7 college tours sponsored by NY State Council.

winter 1967

Mixed Media performances

Lincoln Center Philharmonic Hall, 1965

Museum of Modern Art, 1966, Jan. 1969

Harvard Club, NYC, 1966

Berlin, 1965

Vienna, 1965

Copenhagen, 1965

Carbondale, Ill. "Vision of '65" 1965

Aspen, Colorado Design Conference, 1967

Los Angeles 1967, U. of Southern California

International Congress on Art and Religion NYC,

1967

National Council of Planning Washington, D.C.,

1967

Central Part NYC Design-In, May 1967

Crosstalk, Tokyo, Japan, Feb. 1969

Kyoto, Japan, 1969

Osaka, 1969

Film Artist in Residence

U. of Southern California, 1967

U. of Illinois, 1967

Colgate University, 1968

W.G.B.H.-TV Boston, Mass.

1969-70 concurrent with MIT Fellowship

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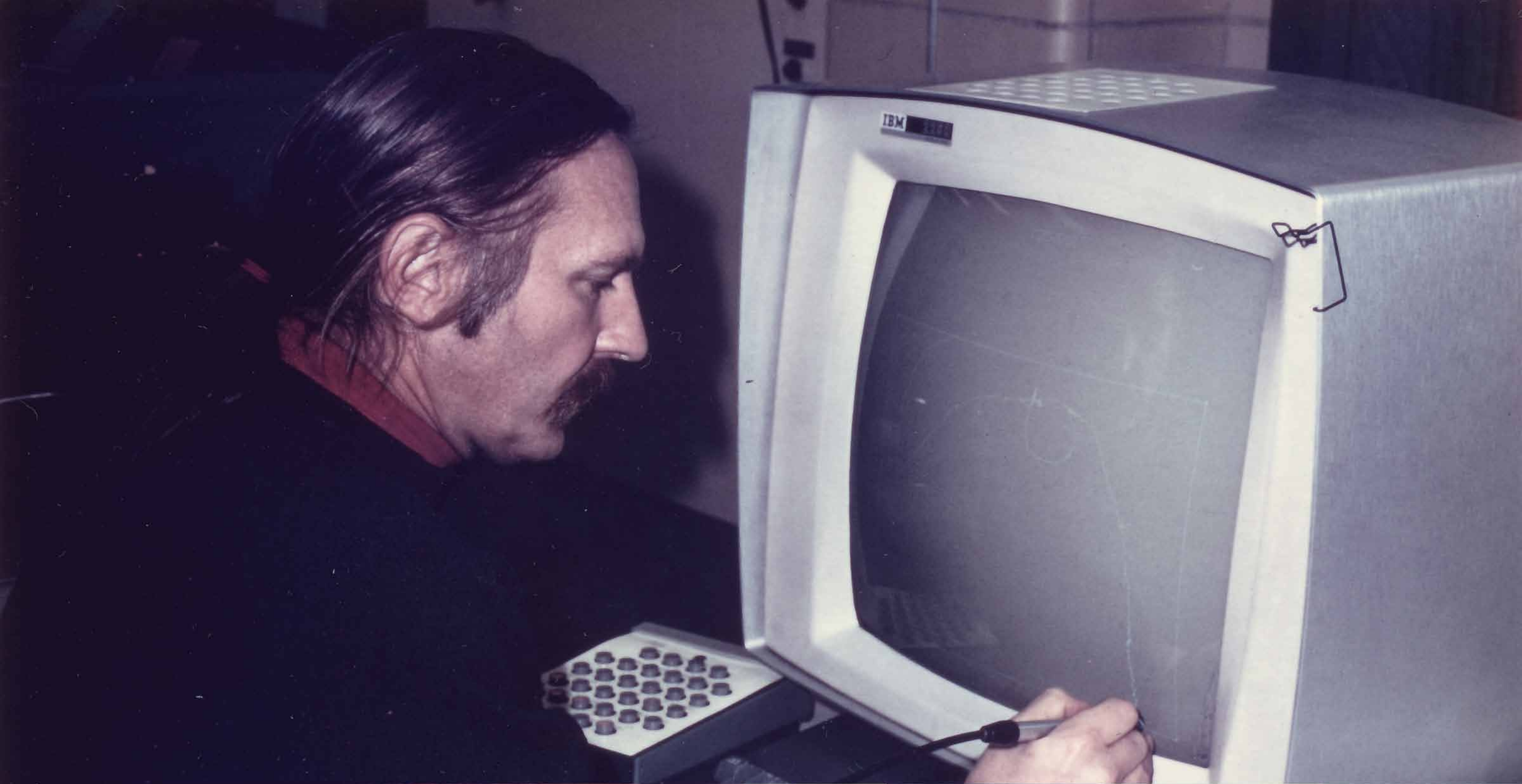
Nihon Gas Kyokai Bldg. 38 Shiba Kotohira-cho

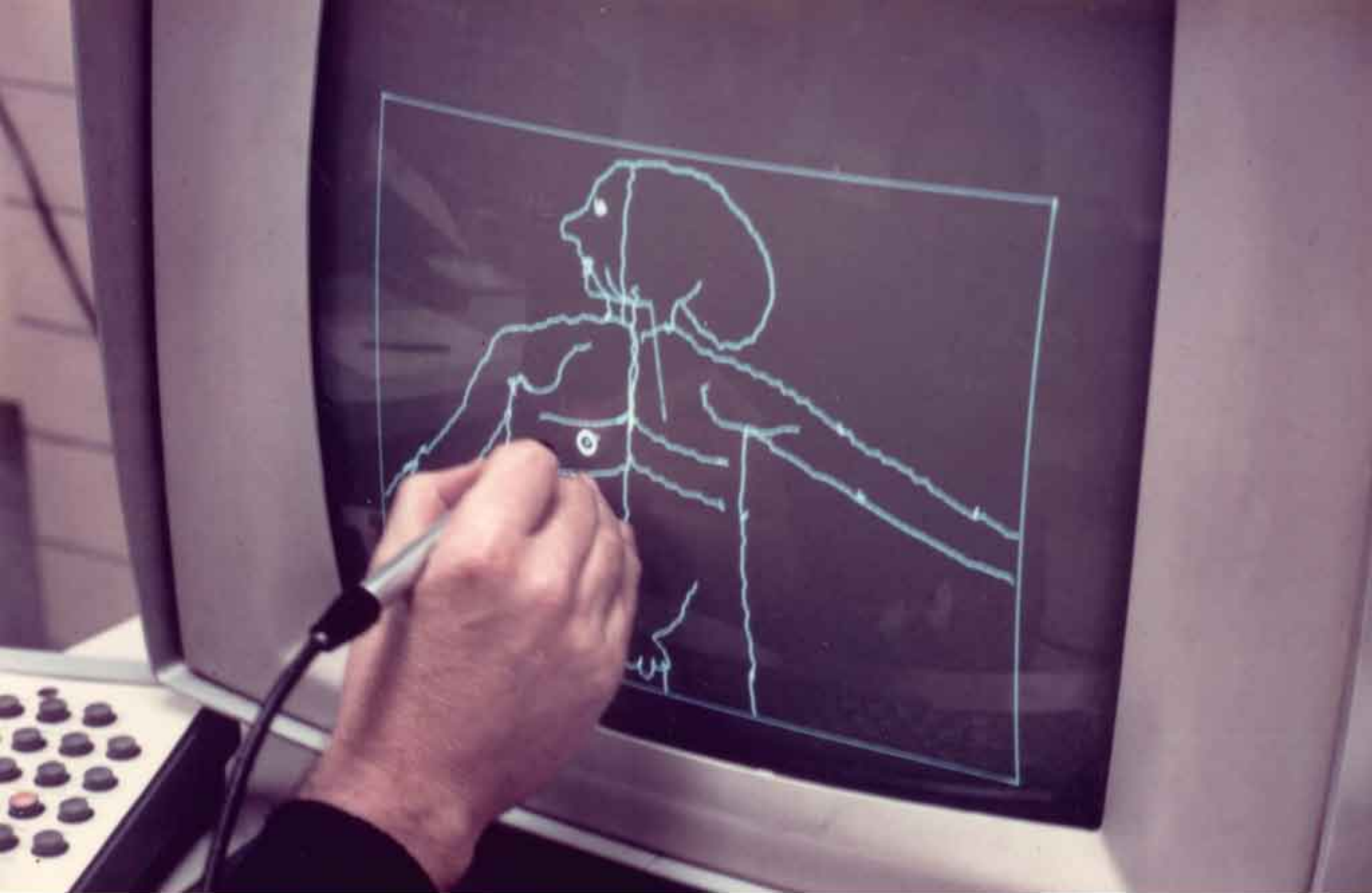
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2-12-21 Otowa, Bunkyo Tokyo Japan

printed in Japan, 1969



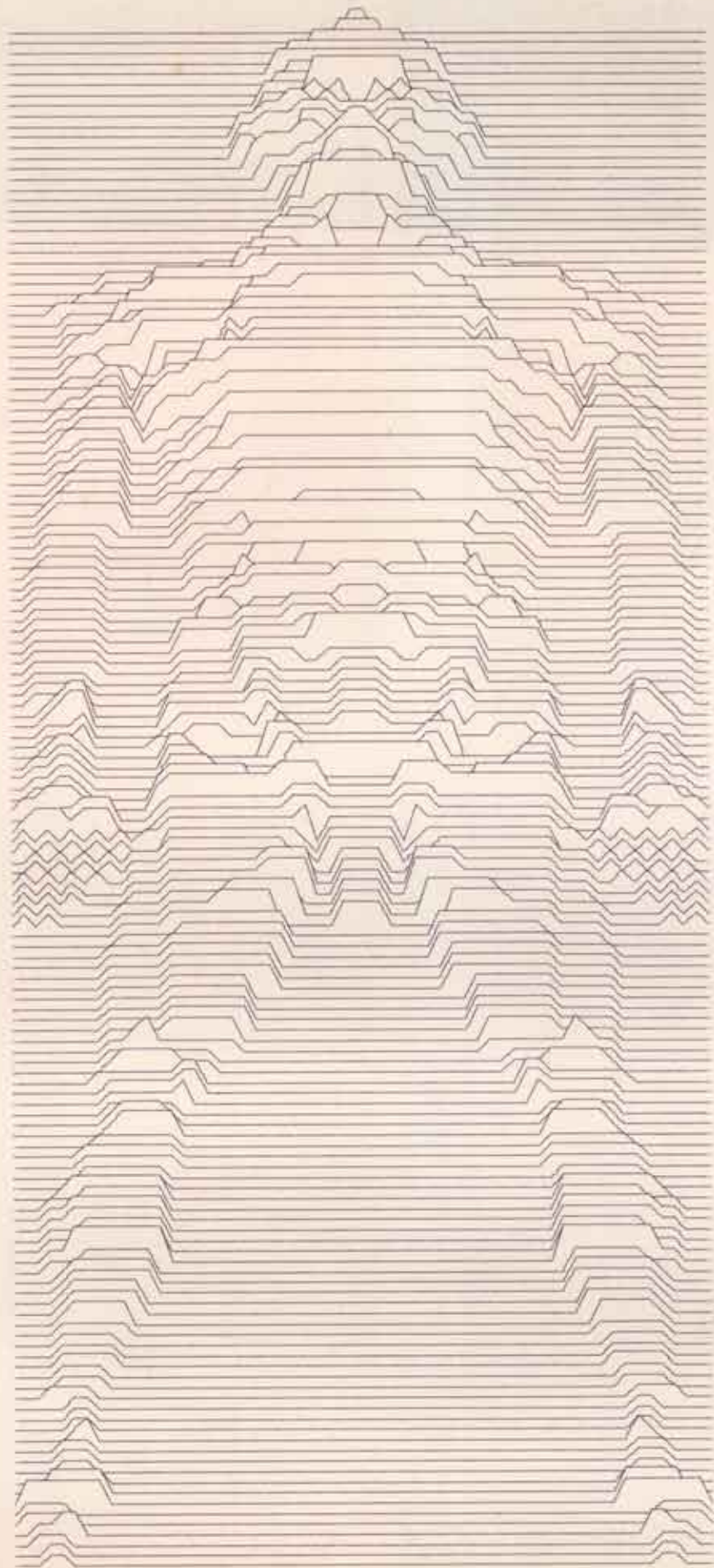


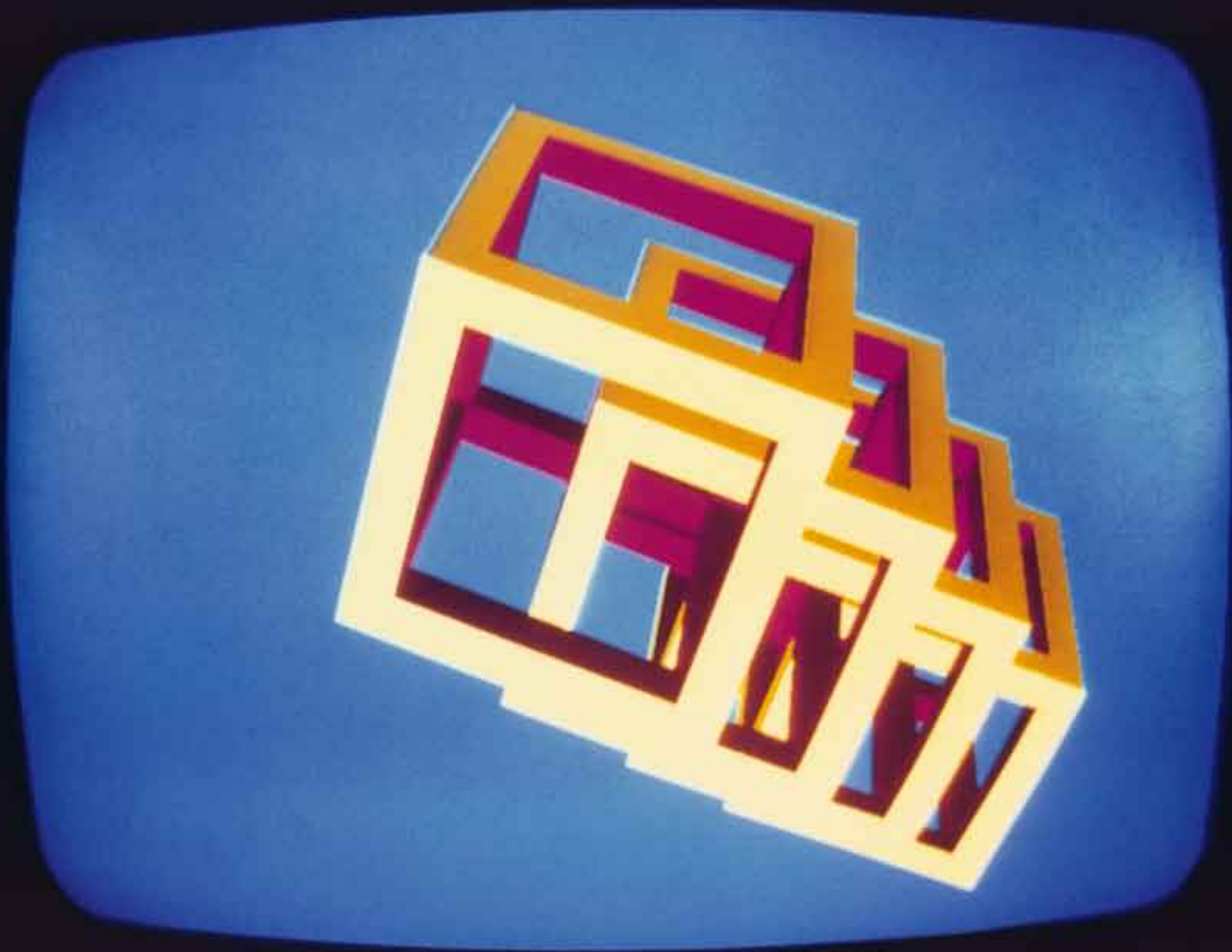














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EXPLANATION

GENE YOUNGBLOOD

Introduction by

R. BUCKMINSTER FULLER

operation is a circle, a set of points. And as far as I'm concerned it's a wave form just as legitimate as the sine wave. So you could run this form back into the same particular operator and tell the computer to use this form—not the sine or cosine, but this form it has just described. The same recursive form applies to the other operations. For instance, you could take projections of projections, use an object as an element to shade a surface and so on.

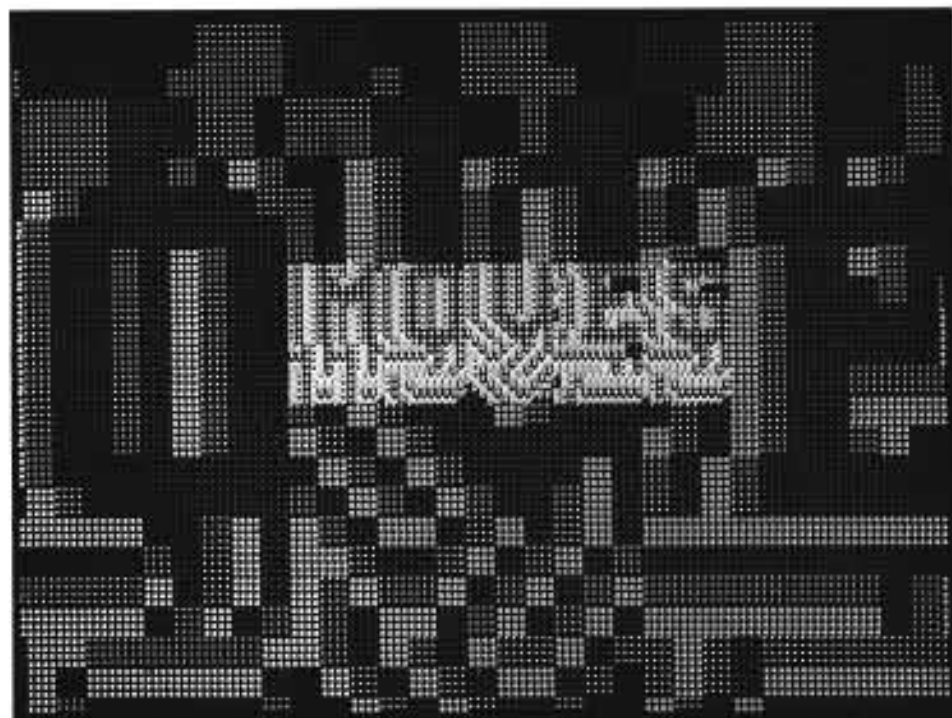
Stan VanDerBeek: Mosaics of the Mind

"We're just fooling around on the outer edges of our own sensibilities. The new technologies will open higher levels of psychic communication and neurological referencing."

For the last five years Stan VanDerBeek has been working simultaneously with live-action and animated films, single and multiple-projection formats, intermedia events, video experiments, and computer graphics. Clearly a Renaissance Man, VanDerBeek has been a vital force in the convergence of art and technology, displaying a visionary's insight into the cultural and psychological implications of the Paleocybernetic Age.

VanDerBeek has produced approximately ten computer films in collaboration with Kenneth Knowlton of Bell Telephone Laboratories in New Jersey. They are descriptively titled *Poem Fields*, *One* through *Eight*, plus *Collisdeoscope* and a tenth film unfinished as of this writing. The term *Poem Field* indicates the visual effect of the mosaic picture system called Belfix (derived from "Bell Flicks") written by Knowlton. A high-level set of macro-instructions was first written in Fortran. The particular translation or definition of this language for each film is then determined by the subroutine system of mosaic composition called Belfix. A new set of Belfix punch cards is fed into the Fortran-primed computer (an IBM 7094 interfaced with an SC-4020 microfilm plotter) for each new movie desired.

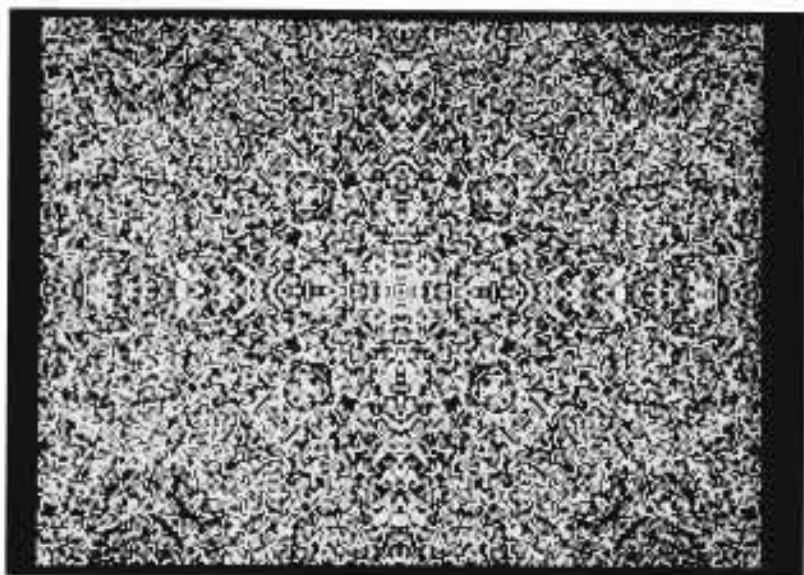
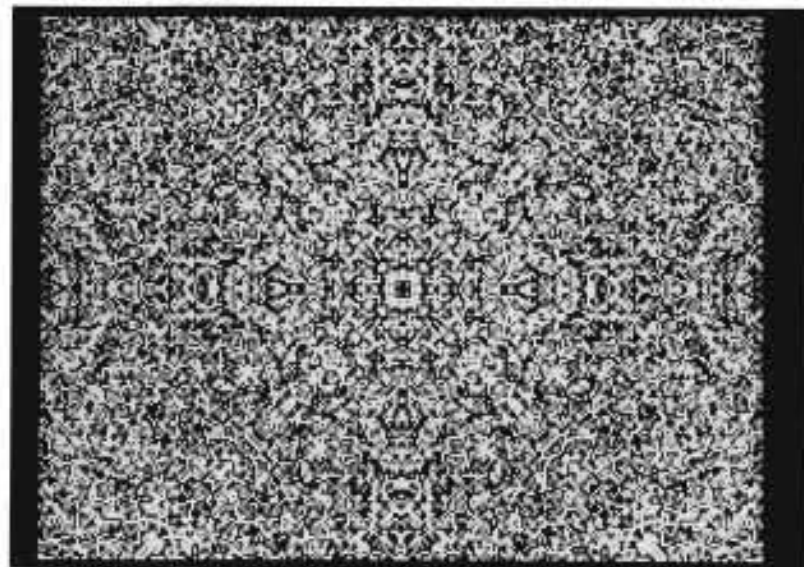
Whereas most other digital computer films are characterized by linear trajectory figures moving dynamically in simulated three-dimensional space, the VanDerBeek-Knowlton *Poem Fields* are complex, syncretistic two-dimensional tapestries of geometrical configurations in mosaic patterns. "The mind is a computer," says



Computer interpretation of the word "movies," from a film by Stan VanDerBeek and Kenneth C. Knowlton.

VanDerBeek, "not railroad tracks. Human intelligence functions on the order of a hundred-thousand decisions per second." It appears this brain capacity was a prime motive in the production of the *Poem Fields*, whose micro-patterns seem to permute in a constant process of metamorphosis which could very likely include a hundred-thousand minuscule changes each second.

"The present state of design of graphics display systems," VanDerBeek explains, "is to integrate small points of light turned on or off at high speeds. A picture is 'resolved' from the mosaic points of light." The artist seems to feel that this process bears some physiognomic similarities to human perception. "The eye," he notes, "is a mosaic of rods and cones."



Variations of the Belfix technique of mosaic image-making, from computer films by Stan VanDerBeek and Kenneth C. Knowlton.

The early *Poem Fields* were investigations of calligraphic relationships between dogs and alphabetic characters integrated into fields of geometrical patterns constantly evolving into new forms. The most famous of these is *Man and His World* (1967), a title piece for an exhibit at Expo '67.

Variations on the mosaic field became more complex with successive experiments, until simulated three-dimensional depth was achieved in the form of infinitely-repeated modular units in perspective. It is immediately obvious that these films would be prohibitively tedious and time-consuming to do through conventional animation techniques. "Because of their high speeds of calculation and display," writes Knowlton, "the computer and automatic film recorder make feasible the production of some kinds of films that previously would have been far too expensive or difficult. In addition, the speed, ease, and economy of computer animation permit the moviemaker to take several tries at a scene—producing a whole family of film clips—from which he chooses the most appealing result, a luxury never before possible."²⁷

The more recent Belfix films have abandoned the original calligraphic patterns for highly complex Rorschach constellations of stunning beauty. They actually began with a film produced by two other scientists at Bell Telephone, B. Julesz and C. Bosche, for use in experiments with human vision and perception. This involved semirandom generation of graphic "noise," whose patterns were reflected several times to produce intricate mandala grids resembling Persian carpets and snowflake crystals.

"We're now working with variations on the Belfix system that involves secondary systems," VanDerBeek explained. "It goes through two levels: first Belfix, then computerizing and quantizing that level. It's something similar to what Ken Knowlton and Leon Harmon did with pictures-within-pictures. We're trying to do that cinematically."

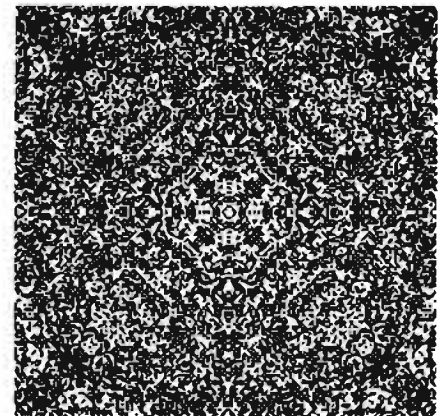
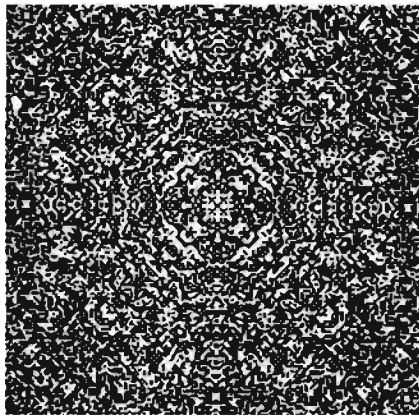
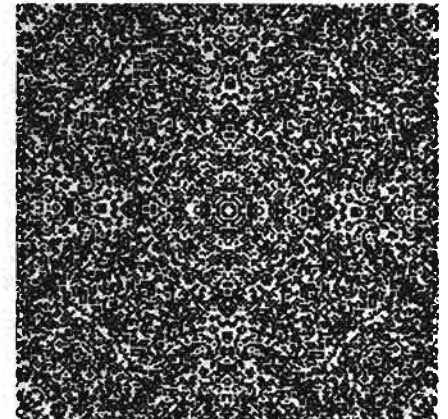
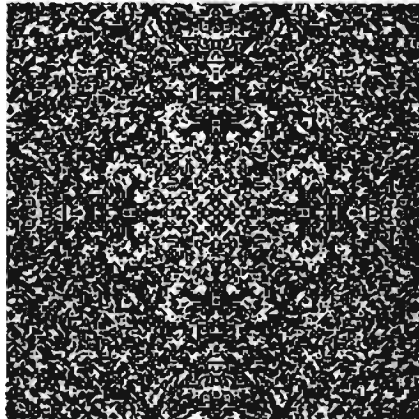
The *Poem Fields* are filmed in black-and-white, with color added later through a special optical process that permits color gradations and increments almost as complex as the forms themselves.

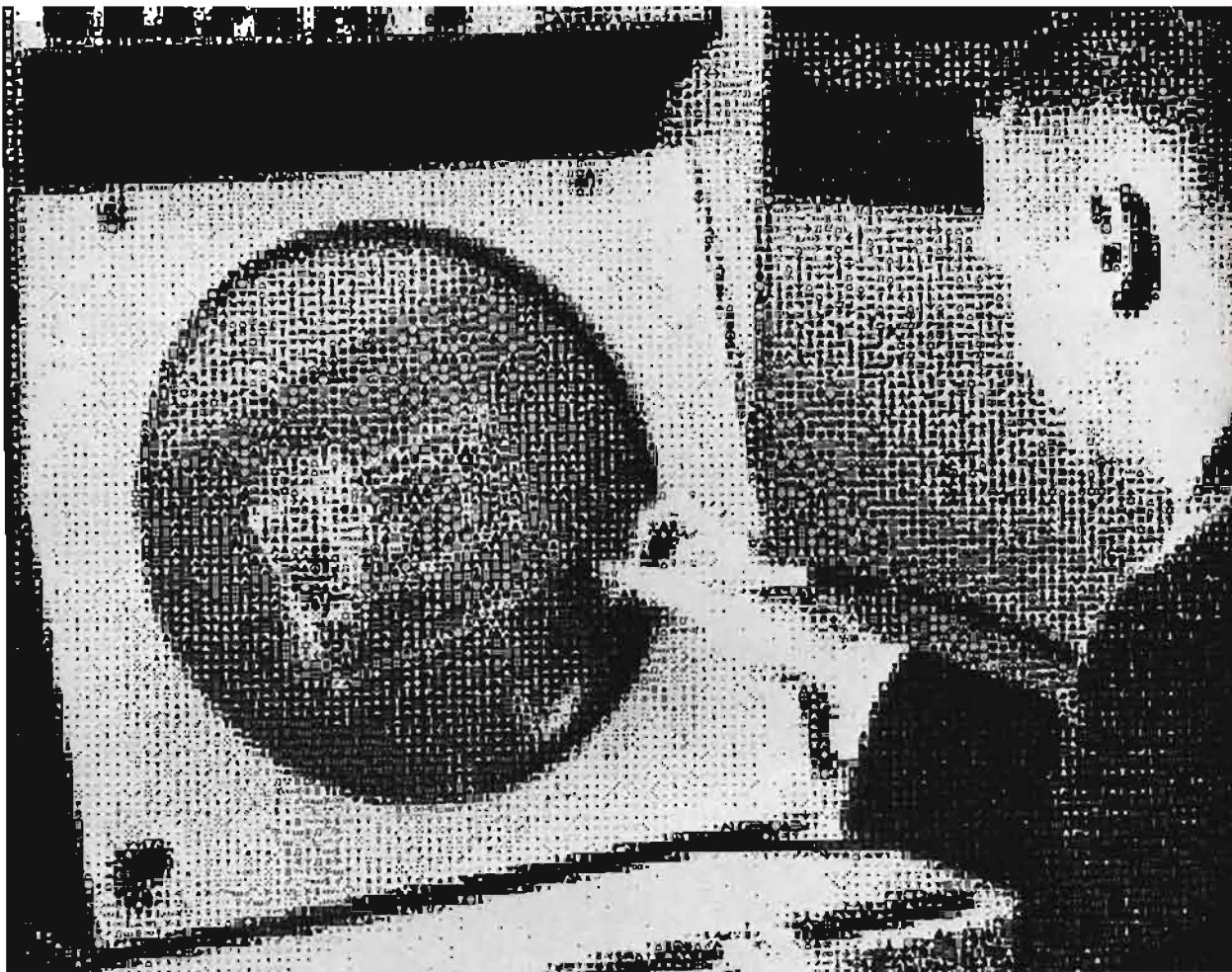
²⁷ Kenneth C. Knowlton, "Computer Animated Movies," *Cybernetic Serendipity*, a special issue of *Studio International*, ed. Jasja Reichardt (London, September, 1968), pp. 67–68.

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Image After Image
Stan VanDerBeek

Computers and video are two new systems for graphic art developed in the last ten years. My first work in computers began in 1966 with some experiments with a computer language called "Beflix." This program, developed by Ken Knowlton, produced a mosaic image in motion. Computers and video offer possibilities to the artist to work in "real time" or in a form of image conception that can only be called "mental movies," that is, thinking about images in motion in the mind's eye. The artist-technician must translate his visual ideas into a code that can be put on punched cards, into a computer, from the computer onto a form of video tape, and from tape to a graphic display system (which is a complex form of video) that displays the image to a movie camera that records the image to make it ready to be presented back to the mind's eye. All of this technical reality sounds complex but will get more available and simple, and develop the image/future for portable electronic books, murals, and three-d environments that respond to the human's mind order of association (approximately 100,000 decisions per second), leaving the artist to consider that video and computers are the new basic image language system for interactive medias. Man to machine . . . man as machine . . . machine/man . . . memory and time sharing . . . logic gates . . . real time . . . art into life . . . life into art . . . light . . . motion . . . time . . . motion pictures as a time machine. . . .





NEW TALENT— THE COMPUTER

The computer—with man as creative director—has revealed a remarkable talent for the graphic arts. Capable of tremendous speeds combined with total accuracy, it has opened up exciting new fields for esthetic discoveries

Stan VanDerBeek

The computer (as a graphic tool) is relatively new in the current rush of technology. In America, widespread use of the computer dates approximately from 1955, when a line of commercial units first became available.

In 1963 computers began to develop possibilities for making graphics. An electric microfilm recorder was introduced; it can plot points and draw lines a million times faster than a human draftsman. This machine and the electronic computer which controls it thus make feasible various kinds of graphic movies which heretofore would have been prohibitively intricate, time-consuming and expensive.

The microfilm recorder consists essentially of a display tube and a camera. It understands only simple instructions such as those for advancing the film, displaying a spot or alphabetic character at specified coordinates or drawing a straight line from one point to another. Though this repertoire is simple, the ma-

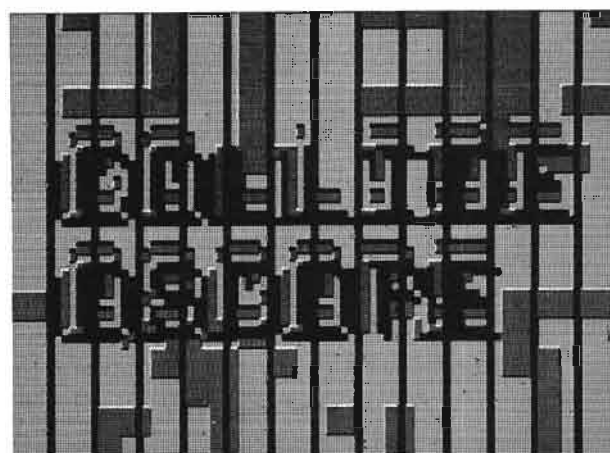
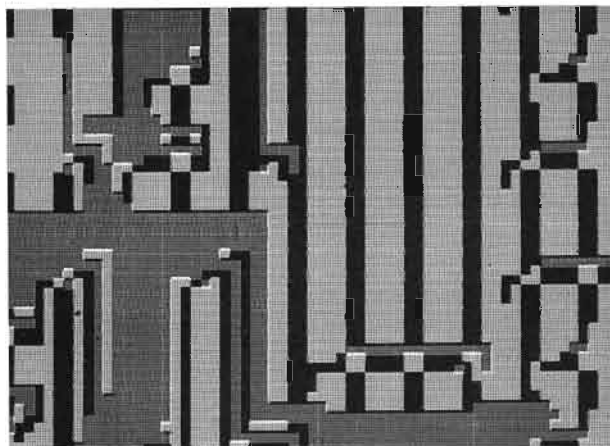
chine can compose complicated pictures—or series of pictures—from a large number of basic elements: it can draw ten thousand to one hundred thousand points, lines or characters per second.

This film-exposing device is therefore fast enough to turn out, in a matter of seconds, a television-quality image consisting of a fine mosaic of closely spaced spots, or to produce simple line-drawings at rates of several frames per second.

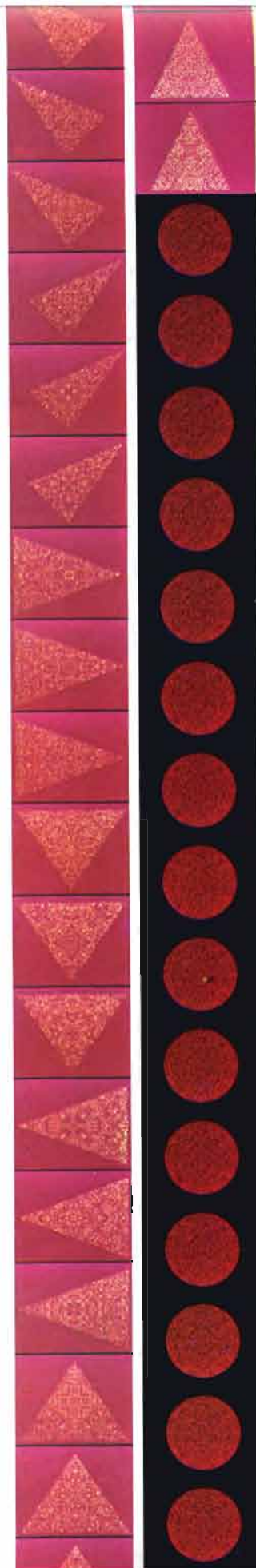
As a technically oriented film-artist, I realized the possibilities of the computer as a new graphic tool for film-making in 1964 and began my exploration of this medium. I have since made nine computer-generated films. To produce these films the following procedure was used: an IBM 7094 computer was loaded with a set of sub-routines (instructions) which perform the operations for computerizing the movie system called "Beflix" devised by Ken Knowlton of Bell Telephone Laboratories. The movie computer program is then written, in this special language, and put on punched cards; the punched cards are then fed into the computer; the computer tabulates and accepts the instructions on the cards, calculating the explicit details of each implied picture of the movie and putting the results of this calculation on tape. To visualize this: imagine a mosaic-like screen with 252 x 184 points of light;

Stan VanDerBeek, experimental filmmaker, is investigating the possibilities of computers in art while serving as artist-fellow at the Center for Advanced Visual Studies, MIT, and artist-in-residence at WGBH-TV, Boston.

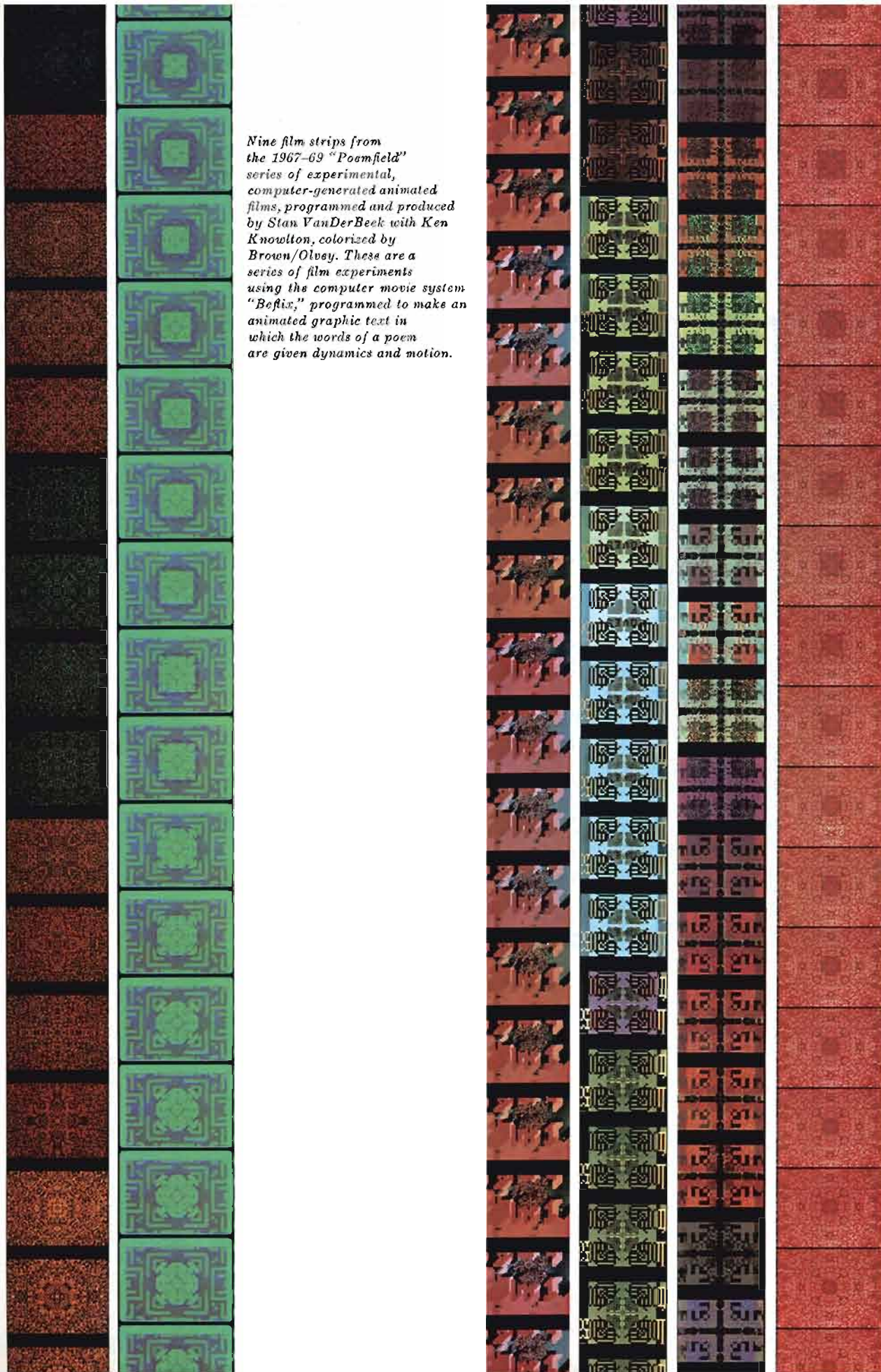
A photo of Carl Christensen, sitting at the Bell Telephone Laboratories' Graphic II console, has been fed into the computer, and the visual information reappears here as translated into symbols representing the light and dark areas in the photo. Harmon/Knowlton, 1967.

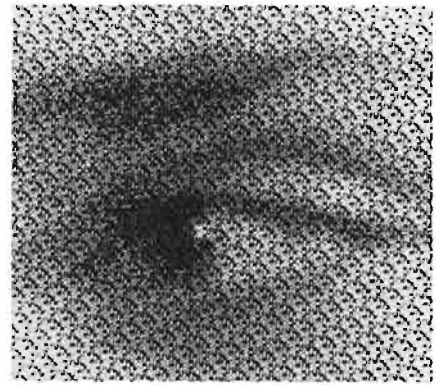


Right: Frames from "Collideoscope," the computer-generated movie programmed and produced by S. VanDerBeek, assisted by K. Knowlton and C. Bosche, in 1966. The two black-and-white frames above show an intermediate stage in the production of the film. The overall pattern and texture of all of VanDerBeek's computer films comes from the grid of 252×184 points that is on the face of the graphic display tube. These 46,368 points that comprise each frame of the movie are not just each a dot of light but are actually characters from the typewriter keyboard mode, and each point can be instantly changed to any of approximately 30 different characters or symbols found on the typewriter. The tube of the graphic display device is called a "charactertron tube"; by instructions in the program, part or all of the 46,368 points can be changed, offering the possibility of larger letter forms or images to be composed of other smaller letters, or words within words. It was this double level that inspired the "Poemfield" series (reproduced next page), in which VanDerBeek is experimenting with printed poetry in cinematic time—graphic letters of the poem appear and disappear in the surface texture of smaller letter forms.

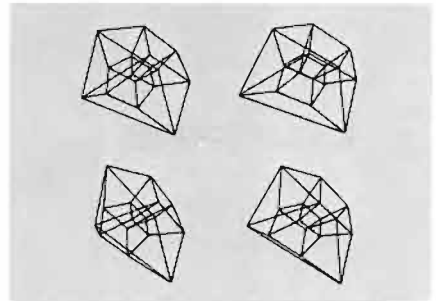


Nine film strips from the 1967-69 "Poamfield" series of experimental, computer-generated animated films, programmed and produced by Stan VanDerBeek with Ken Knowlton, colorized by Brown/Olvey. These are a series of film experiments using the computer movie system "Bestix," programmed to make an animated graphic text in which the words of a poem are given dynamics and motion.

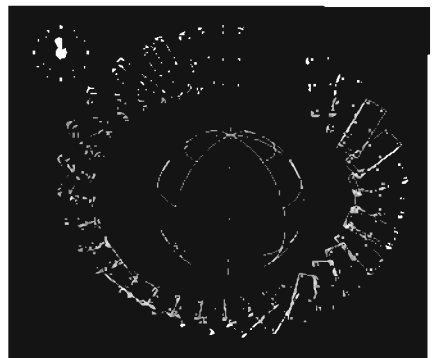




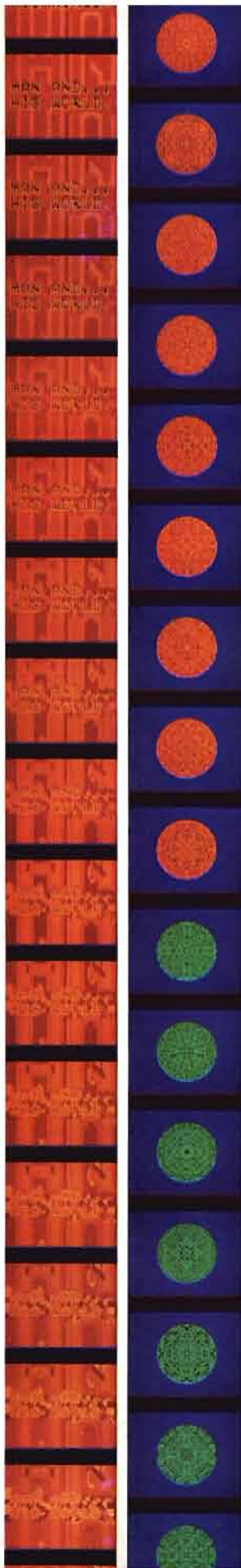
Gradations of dark and light have been assigned number values that can be assimilated by the computer. The computer version, produced at Bell Telephone Laboratories, uses dark and light letters spelling out "one picture is worth a thousand words" to re-create the image of an eye.



Here a mathematical construction is represented with two stereo pairs from a computer-generated film by A. M. Noll. These are views of a four-dimensional hypercube projected mathematically down onto three dimensions and then twice projected to two dimensions—onto slightly different picture planes for the left and the right eye. To view the 3D effect, place a sheet of paper on edge between the stereo pair; position your head so that each eye sees only one image, and, with a bit of adjustment, the images should seem to converge and appear three-dimensional.

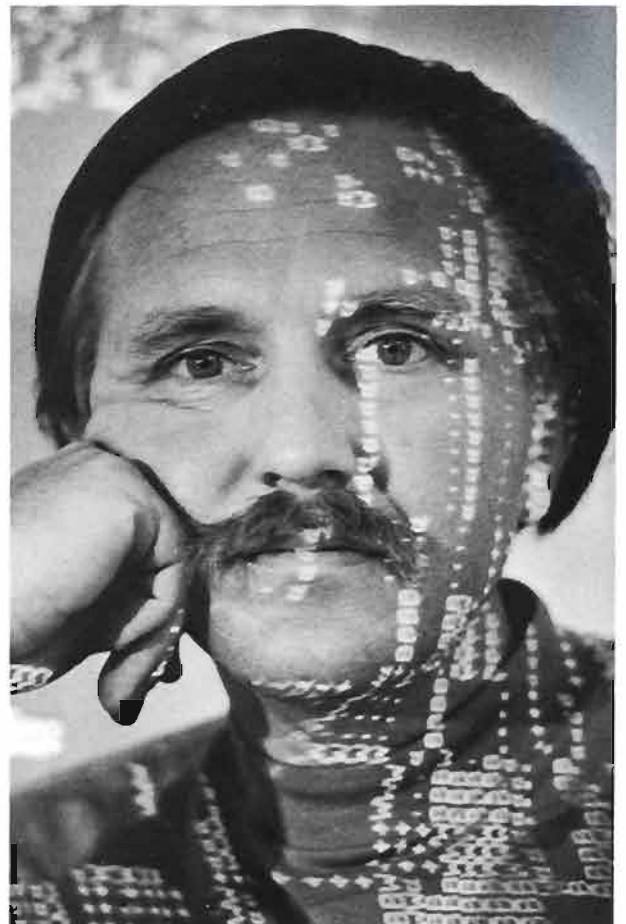


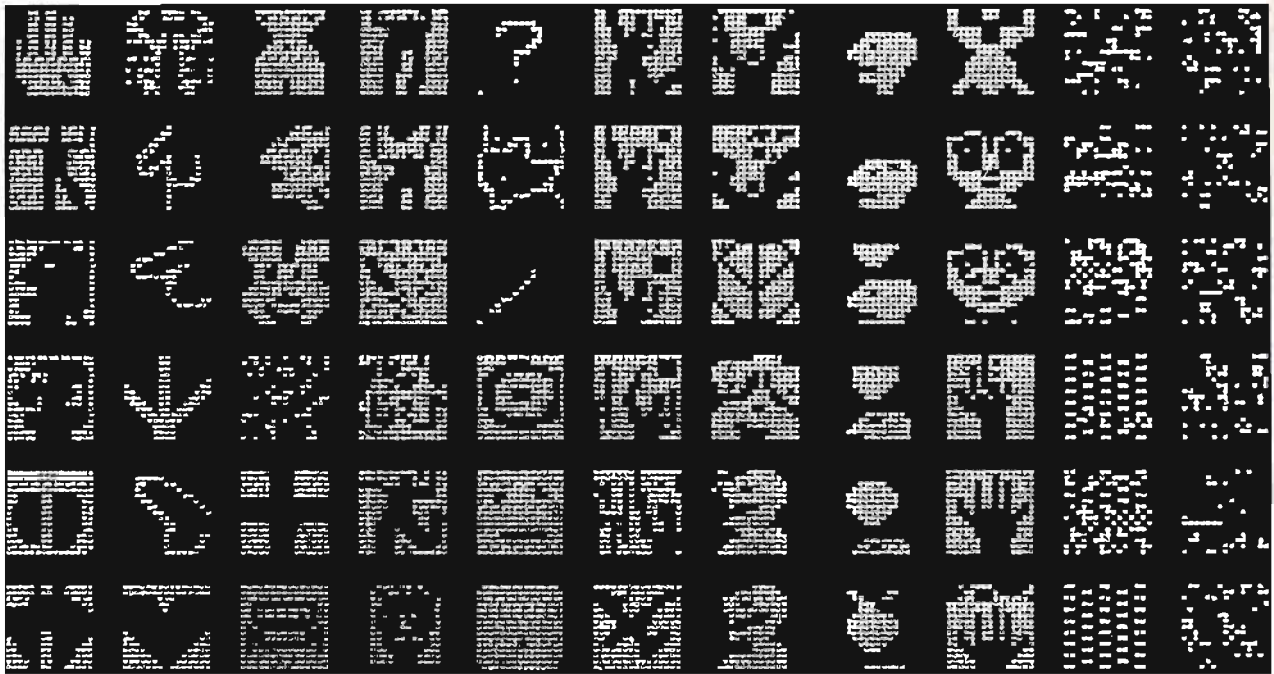
Several superimposed frames from a computer-generated film made in 1963 by E. Zajac at Bell Telephone Laboratories show the result of a simulation of the motion of a communications satellite controlled by a hypothetical orientating system then under study.



Film clips from a computer-generated animated film by Stan VanDerBeek and Ken Knowlton; made in 1967 as an entry in the competition for Expo '67, it was titled "Man and His World." The original film material was produced using the "Beflix" movie language in black and white, and the color was added by optical printing.

Photograph of Stan VanDerBeek by Ken Feil.





These patterns, generated on a 16 x 16" grid, consist of a multitude of picture-symbols that were "drawn" on the face of a cathode tube with a "light pen." The symbols—intended as pictures within a picture—are designed to provide a range of light and dark areas.

each point of light can be turned on or off from instructions on the program. Pictures can be thought of as an array of spots of different shades of gray. The computer keeps a complete "map" of the picture as the spots are turned on and off. The programmer instructs the system to "draw" lines, arcs, lettering. He can also invoke operations on entire areas with instructions for copying, shifting, transliterating, zooming, and dissolving and filling areas. The coded tape is then put into another machine that reads the tape and instructs a graphic display device (a Stromberg-Carlson 4020), which is a sophisticated cathode-tube system similar to a TV picture tube. Each point of light turns on/off according to the computerized instructions on the tape. A camera over the tube, also instructed when to take a picture by information from the computer, then records on film that particular movie frame. After much trial and error—during which time the computer informs you that you have not written your instructions properly—you have a black-and-white movie. This is edited in traditional movie techniques, and color is added by a special color-printing process developed by artists Bob Brown and Frank Olvey.

Movie-making was for long the most revolutionary art form of our time. Now television touches the nerve-ends of all the world; the visual revolution sits in just about every living room across America. The image revolution that movies represented has now been overhauled by the television evolution, and is approaching the next visual stage—to computer graphics to computer controls of environment to a new cybernetic "movie art."

For the artist the new media of movies, TV, computers, cybernetics, are tools that have curved the perspectives of vision, curving both outward and inward. The revolution of ideas and the ecology of the senses began in 1900 (movies were "invented" about the same time as psychoanalysis). Trace the path of ideas of painting over the past sixty years: the breakup of nineteenth-century ideals, step by step; the objet d'art to nonobjective art;

cubism—simultaneous perception; futurism—motion and man-machine metaphysics; dadaism—anti-art, pro-life; surrealism—the dream as the center of the mental universe; action painting—synthetic time-motion; happenings—two-dimensional painting comes off the wall; op art—illusion as retinal "reality"; pop art—"reality" as reminder of reality; minimal art—illusion of reduction; conceptual art—the elements of illusion.

In other words, we have been moving closer to a "mental" state of art/life. Now we move into the area of computers, an extension of the mind with a tool technically as responsive as ourselves. In the developing mental art/life, to "think" about the work is the process of doing the work.

An abstract notation system for making movies and image storage and retrieval systems opens a door for a kind of mental attitude of movie-making: the artist is no longer restricted to the exact execution of the form; so long as he is clear in his mind as to what he wants, eventually he can realize his movie or work on some computer, somewhere.

What shall this black box, this memory system of the world, this meta-physical printing press do for us? Compare the computer to driving a fast sports car; it is difficult to control; although the irony is that at higher speeds less effort is needed to alter and change directions. However, more skill—a complex man/machine understanding—is required.

The future of computers in art will be fantastic, as amplifiers of human imagination and responses, of kinetic environments programmed to each of our interests; in short, computers will shape the overall ecology of America.

It's not very far from the Gutenberg press of movable bits of type to the logic "bits" of the computer. No doubt computers will be as common as telephones in our lives; art schools in the near future will teach programming as one of the new psycho-skills of the new technician-artist-citizen.

RE: LOOK COMPUTERIZED GRAPHICS "Light Brings us News of the
Universe"

1. The mind is a computer--not railroad tracks
2. Human intelligence functions on the order of 100,000 decisions p/second.
3. Computers have reached the speed of human computation in 1967^{2/3} (using 1955 as the approximate starting point of working computers)
4. Conception involves pre-conception
5. To objectify something is to realize it.
6. To visualize something is to symbolize it; A symbol of something is "somethin-"
7. "Oh, I 'see' what you mean" is what you say when you sing "Oh say can you see"
8. The eye itself is now considered a miniaturized computer predetermining information before getting to the brain.
9. At a distance of 5 inches the eye perceives forms .001 inches in size.
10. Computerized graphics now permits visual artists to work in complex image storage systems, a new training is immediately called for to train artists in the new disciplines of images in motion, and in sequence. An "image-memory," i.e., image-sequence-consequence or visual velocity-reference-inference and re-call (re-look). The writing of pictures that will make pictures in motion, in

* APPROXIMATELY 100,000 DECISIONS PER SECOND

coded text form, means a new notation system to store images by, an advantage musical composition has had for centuries. In other words, motion pictures can be written, stored indefinitely (in punched paper form or tape form) and brought "to life" later. Motion pictures can be conceived (written) in airplanes. The computerized graphic display system can draw 10,000 to 1000,000 points, lines or characters per second.

It presently costs about \$500 a minute of film.

$\frac{1}{2}$ of this cost is programming effort

$\frac{1}{3}$ to computer time

$\frac{1}{6}$ to optical printing and sound track

The present state of design of graphics display systems. Integrate small points of light turned on or off at high speeds a picture is "resolved" from the mosaic points of light. The eye is a mosaic of nerve ends (rods and cones)

Cameras can take pictures at speeds to 600,000 frames/second.

Images can be recognized at speeds of $\frac{1}{400}$ th of a second.

Consider Seurat's "Pointillism"

TV's grid Half-tone newsprint

The two essential qualities of image in computer-graphics are line and tone, both at this time are generated by points of light on a display tube, thus curves are "approximate" and

not very effective. "Tones" are 4 shades of white to black.

A system using a light pen is a potential composite of hand graphics and machine--it is still awkward to use; but its importance is in the future.

Man-Made dialogue

Inter-face - the putting together of man and machine.

The resemblance of man/machine--man/machine/interview

The art of the machine

The machine for art.

The mind is a "form" maker, if you can conceive it you can "build" it.

I have been working in computer image making ~~for~~ since 1966 studying the tool/computer, studying myself and imaginizing about the future....

It is perfectly clear that the computer will revolutionize... is that evolutionize visual logic....stop to consider it took approximately 400 years from the invention of the Gutenberg press to the realization of the paper back book in the local drug store....it took approximately 40 years from the invention of television to now be in almost every home in America....it has been about 4 years since computer graphics have become an evident form in America, I noted with interest that at the latest Computer Conference in Boston (May 1969) I estimated 1/3 of all the hardware exhibited in an enormous show room was devoted to image storage/retrieval or generation.....an early state of the art at best....we shall reach the state of the \$50 computer within 5 years...and this shall be a computer that can make images, and be responsive to us...~~man/machine/man~~ man/inter/machine. The mind is a form maker...if you can conceive it you can build it..

the image computer will be as commonplace as the 8mm camera....

we enter the age ^{of} the "homemovies of computers\$....

I am presently an artist-fellow-imageist (artist in residence..) at the Center for Advanced Visual Studies..of M.I.T.

I came here to enlarge my understanding of the unfolding technology of the times...

There are many attitudes that must be explored in the problem/role of the artist/citizen...in the flow of new tools and the ecology of ~~man/man~~ man/earth man/art...