The experimental results appear in Fig. 6.
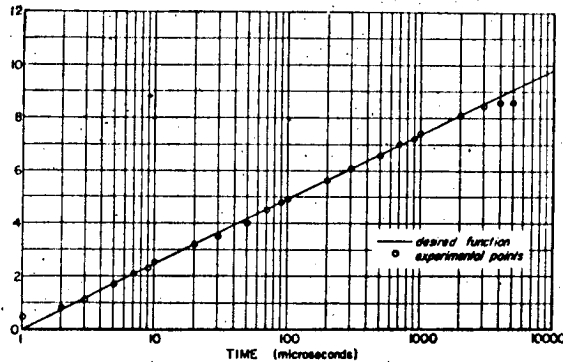

Fig. 6—Experimental results for a range of three decades.

CONCLUSIONS

The method outlined here to obtain a practical logarithmic sweep provides for a wide dynamic range in a simple and unique manner. Design equations are derived for a range of two, three, and four decades of time. A useful circuit configuration employing a transistor summing amplifier is shown, along with important design considerations. Experimental results are given for a typical circuit.

ACKNOWLEDGMENT

The authors wish to express their appreciation to E. Phillips, who built and assisted in the experimental testing of the circuit.

Topological Transformations by Electronic Scanning Techniques*

D. G. AID†, G. H. BALDING‡, AND C. SÜSSKIND§

INTRODUCTION

A METHOD has been developed by which a given mapping can be transformed by electronic means in a way such that one or both coordinates can be changed. This change can be an expansion or contraction of the scale (so that a square area can be made to appear rectangular); in addition, the expansion or contraction can be made nonlinear in a prescribed fashion (so that a linear scale can be made, for example, logarithmic). Moreover, the coordinates can be changed from orthogonal to nonorthogonal, and from straightline to curvilinear (so that the over-all shape of the original map can be changed). These transformations, which cannot be performed by purely optical means (except for the trivial case of simple magnification), require relatively simple electronic circuits. The essential parts, which are shown schematically in Fig. 1, comprise a closed-circuit television chain consisting of a camera and a kinescope. The desired transformation is introduced in the sweep circuits associated with the camera

by modifying the sweeps in accordance with the *inverse* of the functions to be displayed on the kinescope. The method has the advantage (common to most electronic display systems) that several displays can be generated simultaneously, a feature that may be of importance in many situations, as for instance when a permanent (photographic) record is desired.

DESCRIPTION OF THE CIRCUIT

In the following description, it is assumed that the camera is a flying-spot camera because of the high degree of resolution available in such devices: a limiting resolution of the order of 600 lines per inch has been reported.[1] The same type of tube might be used in both the camera and the kinescope since similar orders of resolution are usually desirable in both. The sweeps of the kinescope are of the conventional sawtooth form that produce (in the absence of intensity modulation) a linear rectangular raster of uniform intensity. The sweep rates are determined by the resolution that is required: a high resolution requirement results in relatively slow sweeps, and low resolution in fast sweeps, for a given video bandwith. The total duration of the

[1] L. Shapiro and H. E. Haynes, "High-resolution flying-spot scanner for graphic arts color applications," *RCA Rev.*, vol. 17, pp. 313–329; September, 1956.
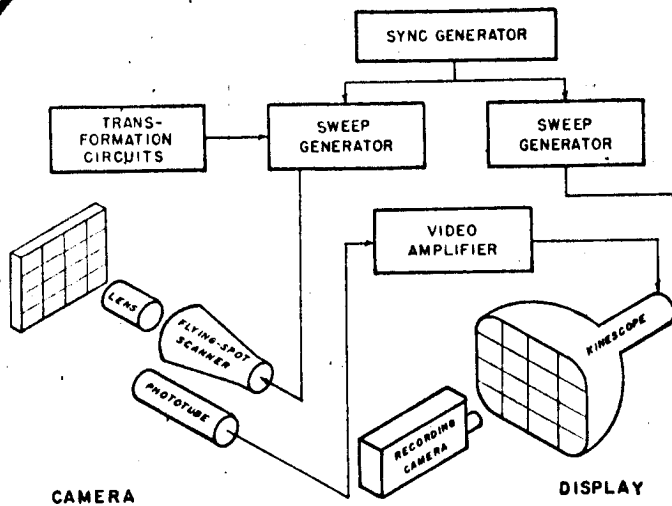
Fig. 1—Block diagram of closed-circuit television chain illustrating 1:1 transformation.
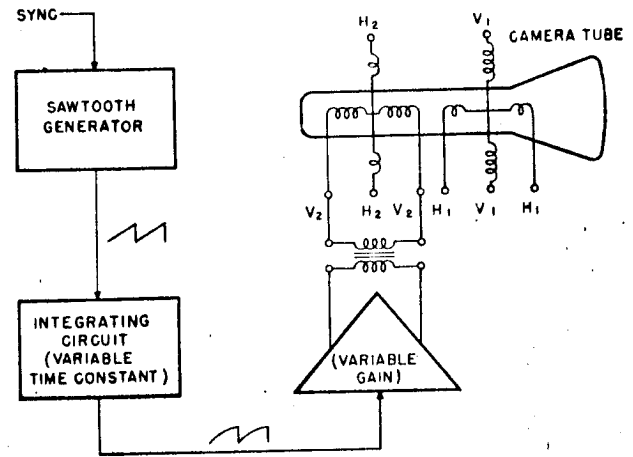

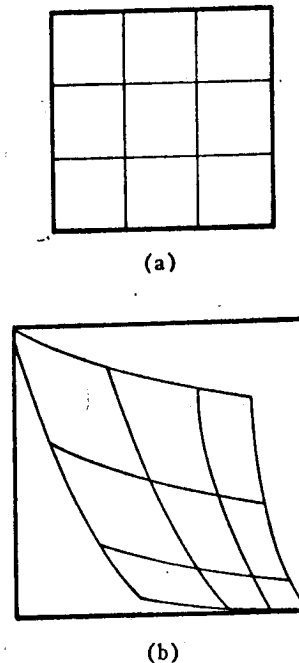Fig. 2—Block diagram of typical transformation circuit.

(a)

(b)

Fig. 3—Sample transformation: orthogonal to curvilinear. (a) Original mapping viewed by the camera. (b) Transformed display as it appears on the kinescope. In this general case, both shape and scale are changed.

sweep is the same in both the camera and the kinescope.

The video pulse train generated by the camera's flying spot, which may be moving in a fashion that is nonlinear in either space or time or both, is used to modulate the linear kinescope raster.

A typical transformation would consist of scanning a regular grid with a flying spot moving at a nonlinear rate (thus producing a nonlinear pulse train), and then using this pulse train to modulate the intensity of the constant-speed kinescope spot. The nonlinearity that must be introduced in the sweep circuits of the camera is the inverse of the function to be displayed on the kinescope. For instance, expanding *one* of the dimensions of the display by a factor of 2 is achieved by reducing the corresponding dimension of the scanning raster by the same factor; a rotation of one coordinate on the display is achieved by the inverse rotation of the corresponding coordinate in the scanner, etc. As an illustration, consider the circuit (Fig. 2) necessary to transform a linear mapping of square shape into a nonlinear display having curvilinear boundaries, as shown in Fig. 3. Deflection in the camera tube is accomplished by means of a special yoke comprising two pairs of windings, one pair each for horizontal and vertical deflection. One set is wound in the conventional manner, with a high-inductance winding V_1 for the low-frequency vertical scan (*e.g.*, 60 cps[2]) and a low-inductance winding H_1 for the high-frequency horizontal scan (*e.g.*, 15,750 cps[2]); the second set is similar, but oriented perpendicular to the first, so that the winding V_2 gives horizontal deflection, and H_2, vertical.

Each winding is driven by a sweep circuit with adjustable linearity and amplitude. (Only one circuit is shown in Fig. 2 for illustration.) Each circuit contains a sawtooth generator (comprising a blocking oscillator

[2] U. S. television standard.

of the appropriate frequency and an RC charging network); its output (a linear sawtooth) is fed into an integrating circuit, which has an adjustable time constant. The integrated signal is then applied to an amplifier circuit with adjustable gain, and the amplified signal is fed through an impedance-matching transformer to the yoke winding. In practice, the deflection yokes, V_1 and V_2, operate together to produce a spot deflection which is the vector sum of two orthogonal displacements. For example, the curvilinear trace on the camera tube, as shown in Fig. 4(a), is produced by the application of the sweep waveforms shown in Fig. 4(b) and 4(c) to the V_1 and V_2 yokes of the camera
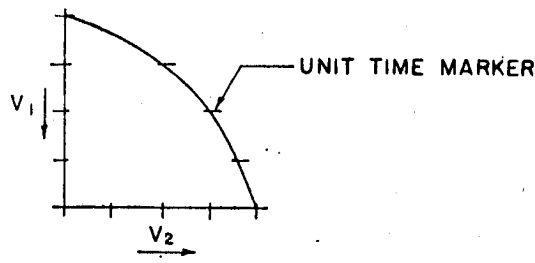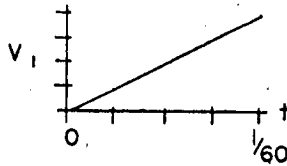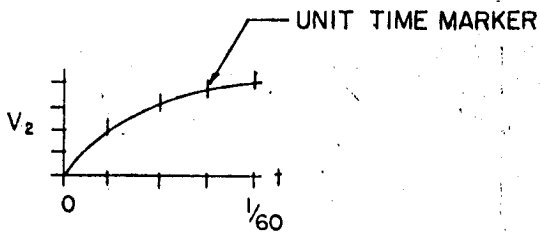
Fig. 4—(a) Curvilinear trace with uniform time markers, and the sweep waveforms applied to (b) V_1 and (c) V_2 yokes. Zero signal on H_1 and H_2.

Fig. 5—(a) Curvilinear trace with nonuniform time markers, and the sweep waveforms applied to (b) V_1 and (c) V_2 yokes. Zero signal on H_1 and H_2.

tube. The instantaneous spot position at any instant is determined by the vector sum of $V_1(t)$ and $V_2(t)$.

Nonlinear spacing of unit time markers is produced by varying the waveform of V_1 as shown in Fig. 5.

Any specified curvilinear trace with specified nonlinear spacing of unit time markers can be produced by using suitable n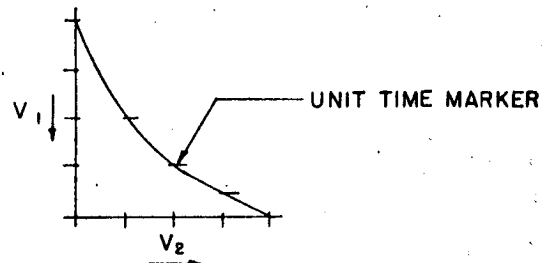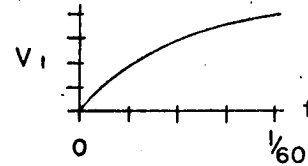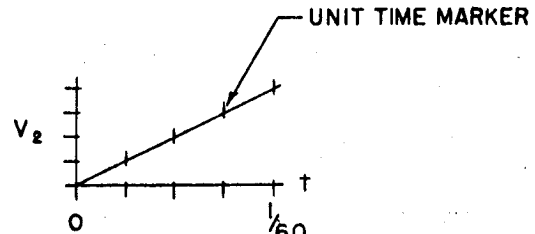onlinear waveforms on both V_1 and V_2. If the same procedure is repeated for the H_1 and H_2 coordinates, an appropriate raster is obtained.

Thus, in the general case, to achieve the orthogonal-to-curvilinear transformation indicated in Fig. 3, the sweeps of the flying-spot camera must be adjusted to produce a raster as shown in Fig. 6. The curvature of the left-hand edge of the camera's raster is obtained by an initial adjustment of the time constant of the integrating circuits, V_1 and V_2 illustrated in Fig. 2; the progressive variation of curvature from left to right is obtained by variation of the time constant as a function of *time* (*e.g.*, by modulating the grid of "variable-resistance" tubes in the integrating circuits), and similarly for H_1 and H_2 in the horizontal direction.

Any tube with a dual deflection system can be used; the two sets of yokes in the magnetically deflected tube can, of course, be replaced by two sets of deflection plates in an electrostatically deflected tube.
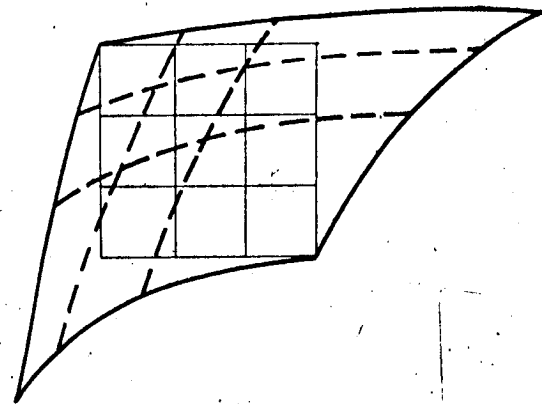
Fig. 6—Shaping of flying-spot camera raster necessary to achieve the transformation of Fig. 3. Dashed lines are unit time markers.

Typical transformations that have been mapped in this manner quite readily are illustrated in Figs. 7–10. In the several examples shown, the vertical and horizontal sweep periods might correspond to the U. S. television standard (*i.e.*, $T_1 = 1/60$, $T_2 = 1/15,750$ second). Each example shows the original pattern viewed by the camera, the distortion introduced in the camera's raster (dotted lines), and the transformed mapping shown on the display tube, together with the sweep

ORIGINAL PATTERN

SCANNING RASTER

outline of flying-spot scanner tube

DISPLAY

outline of display tube
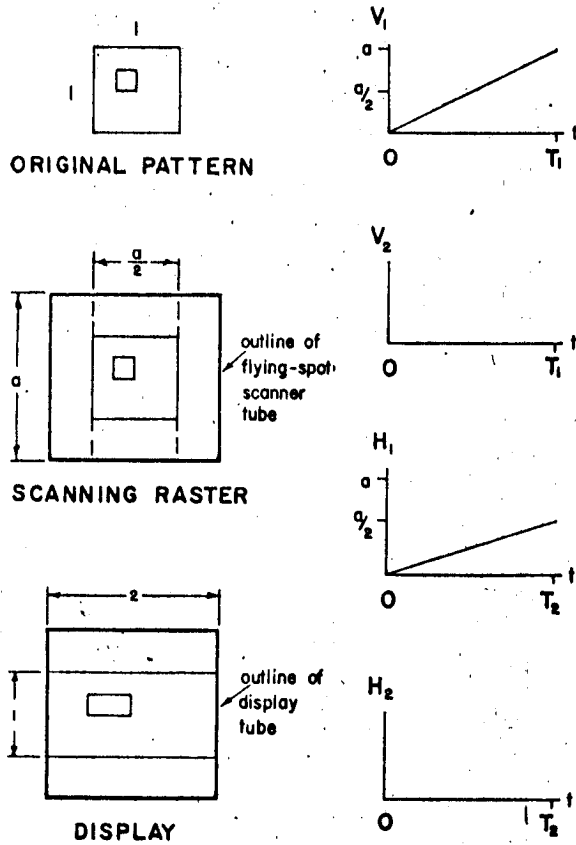
Fig. 7—Scale change in one dimension. $V_1 = ta/T_1$; $V_2 = 0$; $H_1 = ta/2T_2$; $H_2 = 0$.

ORIGINAL PATTERN

SCANNING RASTER

DISPLAY

Fig. 9—Rectangular-to-trapezoidal transformation. $V_1 = ta/T_1$; $V_2 = 0$; $H_1 = ta/T_2$; $H_2 = (tf/T_2)[1 - (t/T_1)]$.

ORIGINAL PATTERN

SCANNING RASTER

DISPLAY

Fig. 8—Orthogonal-to-nonorthogonal transformation. $V_1 = ta/T_1$; $V_2 = 0$; $H_1 = tc/T_2$; $H_2 = td/T_2$; $\alpha = \tan^{-1}(d/c)$.

$z = w^k$

ORIGINAL PATTERN

$z = w^k$

SCANNING RASTER

$z = w^k$

DISPLAY
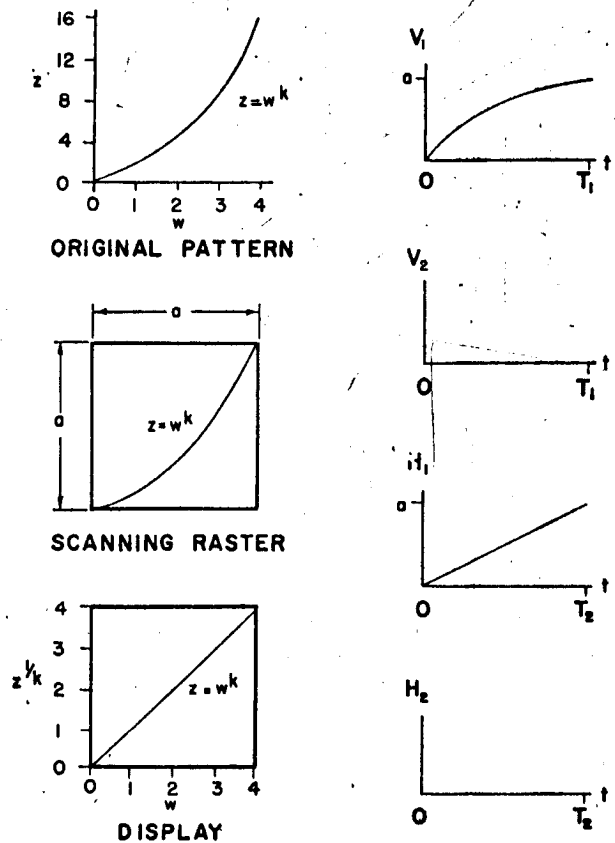
Fig. 10—Rectangular to semilogarithmic transformation. $V_1 = (ta/T_1{}^2)(2T_1 - t)$; $V_2 = 0$; $H_1 = ta/T_2$; $H_2 = 0$; $k = 2$.

waveforms applied to the yoke windings of the camera tube. These waveforms are shown as a function of time t (obviously not to scale, since $T_1 >> T_2$), and the mathematical expressions for V_1, V_2, and H_1, H_2, which are given in the captions of the figures, refer to repeating functions that apply for $0 \le t \le T_1$ and $0 \le t \le T_2$, respectively.

Among possible applications of the device described are quick scale expansions, conversion of linear to logarithmic scale (and vice versa), and corrections for distortions introduced by photographic lenses.

Moreover, by use of a spiral scan, a polar plot can be transformed to rectangular coordinates by this method. Other transformations will readily come to mind.

Correction

H. B. Brooks* and K. E. Walker,† authors of "Average-Responding Instruments," which appeared on pp. 258–261 of the December, 1957, issue of these TRANSACTIONS, have requested that the following corrections be made to their paper.

A more rigorous mathematical proof is given below. When RC is not constant, (1) should be[1]

$$E_{out} = \epsilon^{-\int dt/RC}\left[\int \frac{E_{in}}{RC} \epsilon^{\int dt/RC}dt + K\right]. \quad (1)$$

Then, when RC is set equal to t:

$$E_{out} = \epsilon^{-\ln t}\left[\int \frac{E_{in}}{t} \epsilon^{\ln t}dt + K\right]$$

which reduces to

$$E_{out} = \frac{1}{t}\left[\int E_{in}dt + K\right], \quad (4)$$
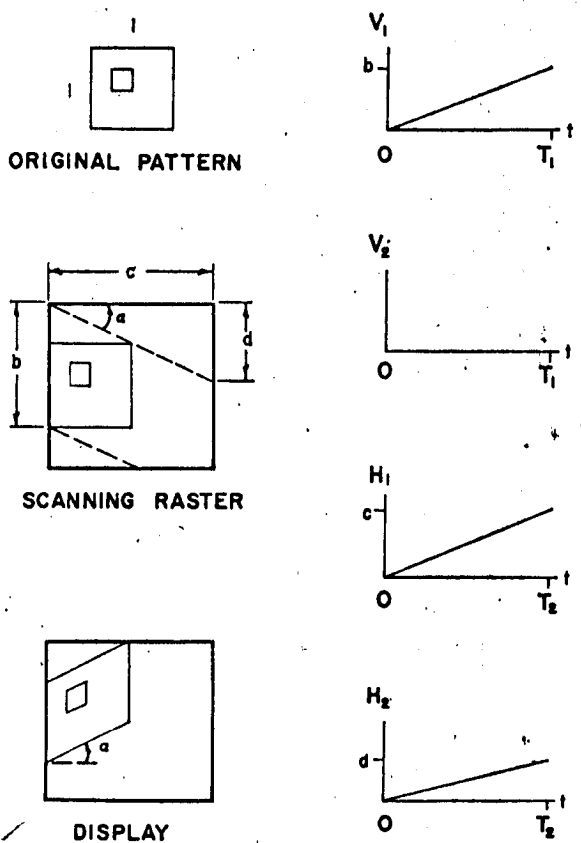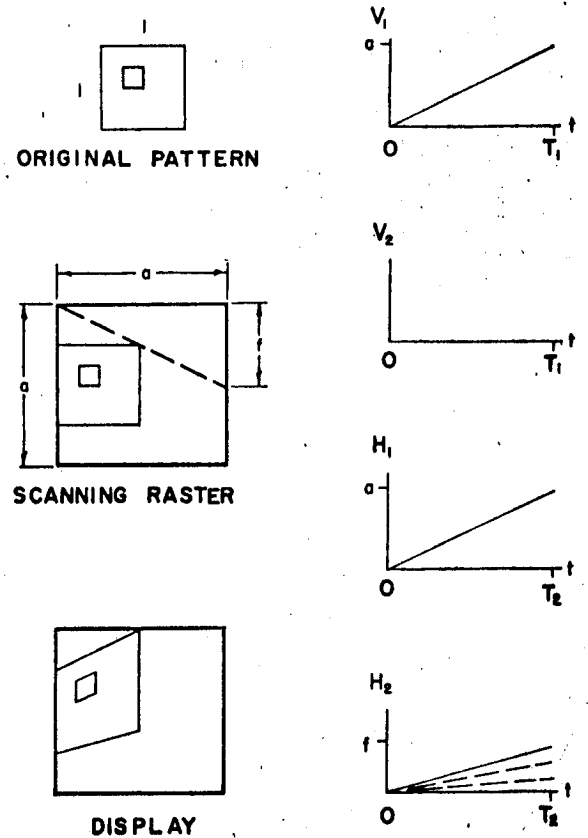
thus giving the same result as reported in the original paper. The authors are indebted to B. Carney for pointing out the lack of rigor in using the simplified form for (1) when RC is variable.

A corrected Fig. 4 is included herewith. It is derived as follows. Represent the sinusoid by

$$E_{in} = \hat{E}_{in} \cos \omega t. \quad (5)$$

Here $\hat{E}_{in}$ represents the peak value of the sinusoid. Substitute (5) into (2):

$$\frac{E_{out}}{\hat{E}_{in}} = \frac{1}{t}\int_{t_1}^{t_2} \cos \omega t dt = \frac{1}{\omega t}\left[\sin \omega t\right]_{t_1}^{t_2}$$

$$\frac{E_{out}}{\hat{E}_{in}} = \frac{1}{\omega t}(\sin \omega t_2 - \sin \omega t_1)$$

$$\frac{E_{out}}{\hat{E}_{in}} = \frac{1}{\omega t}\left[2 \sin \omega \left(\frac{t_2 - t_1}{2}\right) \cos \omega \left(\frac{t_2 + t_1}{2}\right)\right]. \quad (6)$$

In (6) the cosine term varies with the phase of the sine

* Missile Systems Div., Lockheed Aircraft Corp., Palo Alto, Calif.
† Convair Div., General Dynamics Corp., San Diego, Calif.

[1] I. Sokolnikoff and E. Sokolnikoff, "Higher Mathematics for Engineers and Physicists," McGraw-Hill Book Co., Inc., New York, N. Y.
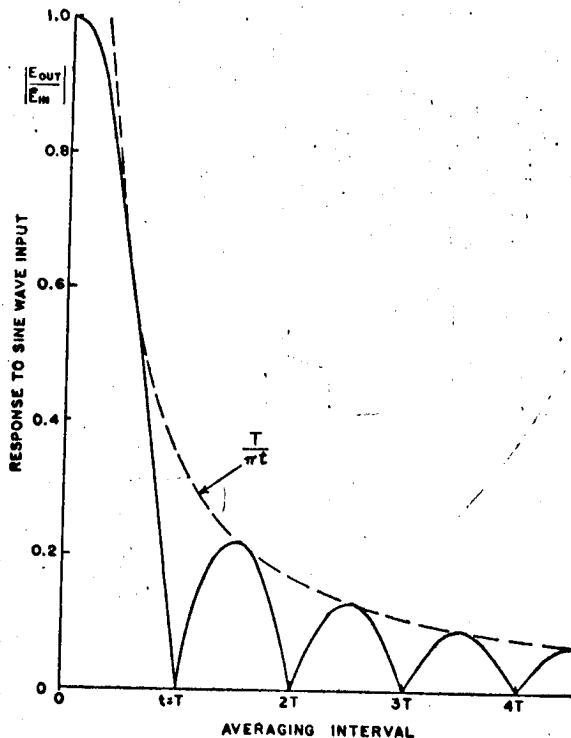
Fig. 4.

wave during the averaging interval. Since these were not synchronized in the test setup, ten readings were taken at each frequency and the worst of these were compared in Fig. 5 with the peak value to be expected from (6). This peak value is obtained by substituting 1 for the cosine term:

$$\frac{E_{out}}{\hat{E}_{in}} = \frac{2}{\omega t}\left[\sin \omega \left(\frac{t_2 - t_1}{2}\right)\right]. \quad (7)$$

To simplify the notation [as was done previously in (2)–(4)], the averaging interval was chosen so that $t_1 = 0$ and we drop the subscript in t_2. Also, it is convenient to substitute $2\pi/T$ for the sine wave's angular frequency ω:

$$\frac{E_{out}}{\hat{E}_{in}} = \frac{T}{\pi t} \sin \frac{\pi t}{T}.$$

Eq. (7) is plotted in Fig. 4 herewith.

Chronology

1965
Paik buys Sony's first portable tape recorders

1967
At KQED in San Francisco an experimental television program is
established under the drection of Brice Howard, funded by the
Rockefeller Foundation
At WGBH in Boston, experimental television funded by Rockefeller
Foundation

1968
New York City -Eric Siegel builds synthesizer: and,
Les Levine exhibits IRIS, a "television sculpture"
At KQED - first Artists- in Residence -Richard Feliciano, a
composer, and Bob Zagone
Skip Sweeney buys portapak with a group of friends in Santa
Clara, California
New York City - video group, Commediation includes David Cort,
Frank Gillette, Ken Marsh Howie Gutstadt
At WGBH - Nam June Paik, Artist in Residence
At WGBH - Stan VanDerBeek, Artist in Residence
N.J. Paik and Shuya Abe build synthesizer

1969
Exhibition "Television as a Creative Medium" organized by Howard
Wise at his New York City Gallery on 57th Street
KQED work shop became the National Center for Experiment in
Television (NCET) with a basic group of William Rosenquist, Bill
Gwin, Stephen Beck, Don Hallock, Bill Roarty, Richard Feliciano,
and Warner Jepson
Corporation for Public Broadcasting sponsors internship at KQED
WGBH airs The Medium is the Medium, video art "magazine" produced
by Fred Barzyk

1970
New York State Council for the Arts begins to fund video
Exhibition "Vision and Television" organized by Russell Connor
at Rose Art Museum, Brandeis University
Magazine Radical Software published by Raindance Corporation
Journal Avalanche edited by Willoughby Sharp
At KQED, summer, air Paik & Abe's VIDEO COMMUNE, 4 hour program
and VanDerBeek's VIOLENCE SONATA
San Francisco roup - Video Free America, co-founded by Skip
Arthur Ginsburg and Skip Sweeney
Skip Sweeney became a master a feedback

1971

New York City - The Kitchen, an electronic arts performance
center established by Woody & Steina Vasulka
Exhibition of video art at the Whitney Museum of American Art ,
curated by David Bienstock, Bruce Rubin and Woody Vasulka
Los Angeles - California Institute of the Arts (Cal Arts) video
activity - John Baldessari, Allen Kaprow, Shigeo Kubota, Nam June
Paik & Gene Youngblood
Expanded Cinema by Gene Youngblood published
At WGBH - broadcast of VIDEO VARIATIONS, a group of pieces set to
music, produce by Ron Hays using the Paik-Abe synthesizer
David Ross appointed video curator at the Everson Museum,
Syracuse, New York
George Bolling appointed video curator at de Saisset Art Gallery
at the University of Santa Clara, California

1972
Rockefeller Foundation funds the Television Laboratory (TV Lab)
at WNET in New York City under the direction of David Loxton
At KQED - Bill Gwin and Warner Jepson create tape IRVING BRIDGE;
William Rosenquist and Bill Roarty - LOSTINE; Don Hallock - KISS
WITH NO UP; Stephen Beck - CONCEPTION, and with Jordan Belson -
CYCLES; and, Roarty & Hallock - UNTITLED.
Woody & Steina Vasulka produce THE GOLDEN LEGEND

1973
Don Hallock exhibits "Videola" from KQED at the San Francisco Art
Museum (Summer)
WGBH broadcasts Video: The New Wave, video art "magazine"
produced by Rick Hauser
At WNET - Ed Emshwiller's SCAPE MATES, N.J. Paik's GLOBAL
GROOVE, and Bill Gwin's SWEET VERTICALITY

(?date) Binghampton, New York - Center for Experimental
Television established by Ralph Hocking & Sherry Miller
(?date) Dallas - NCET satellite center established at Southern
Methodist University (SMU) under the direction of David Dowe and
Jerry Hunt. Dowe & Hunt produce PROCESSION & ELECTRONIC NOTEBOOK
(?date) Minneapolis - University Community Video established at
University of Minnesota, where Jim Byrne creates TANGENT Hunt

1974
WGBH metamorphosis into New Television workshop established in
Boston, under the direction of Dorothy Chisea
Seattle, Anne Focke established a video center called "and/or"
and exhibits work by Ron Ciro of KCTS and Cliff Hillhouse, an
engineer and designer of his own quantizer/colorizer, and Bill

CHEW ON "MY FATHER'S FARM"

(?date) Buffalo, New York - Media Study Center established by Gerald O'Grady at State University of New York (SUNY), Buffalo, with a faculty of Paul Sharits, Hollis Frampton, Woody and Stein Vasulka

1975

1975
WNET broadcast the Video and Television Review (VTR), a video magazine hosted by Russell Connor.
Exhibition "Southland Video Anthology" organized by David Ross, Deputy Director for Film and Television, Long Beach Museum of Art

Knokke-Heist   **25.12.1974/2.1.1975**

Video / Peter Weibel

VIDEOLOGY

In the last decade the avantgardefilm was occupied with structural ques-
tions of the organisation and sequence of signs, the formal syntax of the
calculus film, and how this filmic syntax generates meaning. By inves-
tigating possible interpretations of images the filmmakers have enlarged
the codes of cinematography, but not the calculus. Still they have
introduced some transitions to stills (fotography) and video.

What are now the videologic constants of the calculus video that seems to
be a broader one as film, if any analogy is useful ? I would propose five
features that construct the video system (VT videotapes, TV television,
VTR videotape recording) formally, by which new relations and new
works could be discovered and produced : synthetic, transformation,
selfreference, instant time, box-character.

The synthetic generation of the image by an electronic machine (which
needs not to picture the existing world) and the transformation possibi-
lities of the signs are therefore the foremost field of the psychedelic/
surrealistic videofreak, but also the field of future rigorous formal
investigation of colour, time, space. For the cool user of the new dope
(tv and vt are drugs as all time machines) is the feedback possibly the
most interesting, which has two sides, the instant time = simultaneity
(that you can see what happens as reality as the same time as picture)
and the selfreference (that objects can be selfreferred in time; self-
reference is a tense form of being). Because of its selfreference and
its time element (live or delayed time) video is specially suitable for
live performances and actions. By box-character I just mean that machine-
character of video as time and space switch in a living room.
As time-space-machine video is therefore also very suitable for new con-
cepts of sculpture video sculptures and video installations.

In the classical representative art time played no role. But with film
and video as non-classical arts time started to emerge in the art object
(a classical artform like sculpture even got influenced by time and
became process art etc.). If you see history as a kind of selfrealisation
of man and art as a kind of selfdemonstration, then you can say that
video is the first mean in the history of art that has physically realised
such a basic concept of western culture like selfreference (i.e. the basis
of consciousness). Video is like a new organ in the evolution of man,
it is the implementation of a mental structure into technical construct,
a shift of code, an enlargement of the code into its own basis.

Is it allowed to say that the classical cinematography grew to expanded
cinema (with all its new formal actions and projection systems) and
transformed with video etc from a projection system to a general picture
processing and generating machine ?

VIDEO : Beknopte chronologie voor Europa, U.S.A., Japan en Canada.

1963

W. Vostell en Nam June Paik tonon in de galerij Parnass te Wuppertal
(BRD) normale televisiebeelden, die door verandering in het electro-
magnetisch veld geabstraheerd worden. W. Vostell omschrijft deze
experimenten als "TV-Decollagen" en realiseert op basis hiervan de
film "Sun in your head".

1964

Nam June Paik maakt video-opnamen van het bezoek van paus Johannes XXIII
aan New York. De voorstelling ervan gebeurt in het café "Au Go Go"
in Greenwich-Village.

WGBH-TV in Boston lanceert "Jazz-Workshop, het eerste TV-programma
met visuele experimenten.

S. Bartlett: OFFON

1965

Nam June Paik : Participation TV.
Nam June Paik, J. Yalkut: Fables Electroniques
P. Roehr: Filmmontagen I: Tunnel, Haare, Turm, Wolkenkratzer, Verkehr,
Kännen, Gulf I.
M. Kagel: Antithese
M. Mcluhan publiceert "Understanding Media".

1966

Nam June Paik: Electric Moon; Tango Electronique
J. Yalkut, Nam June Paik: Paikpieces (1966-69) met o.a. Beatle
Electronique en Videotape-study n° 3.

S. Vanderbeeck: Panels for the walls of the world - Part I.

M. Minujin: Simultaneity in Simultaneity.

A. Hay: Grass Field.

1967

Nam June Paik: Videotape-study n° 3 (1967-69)
H. Nitsch: Aktion und Interview
M. Minujin: Minuphone
B. Mefford: Arlington
T. Sjölander, L. Weck, S. Höglund: Monument
A. Tambellini: Black TV, Black Video one.
F. Kriwet: Teletext

F. Barzyck mengt film-, video- en "life" materiaal voor de TV reeks
(WGBH-TV) "What's happening Mr. Silver".

F. Forsting: Artikulation; TV-film naar electronische muziek van
G. Ligeti.

Oprichting WNFT-TV te New York en KQED in San Francisco, dat het-
zelfde jaar begint met het programma "Artists-in-residence".

1968

T. De Witt: The Leap
L. Sears: Sorcery
G. Markopoulos: Alter Action
L. Levine: Iris
L. Becker: Horizont (voor B.B.C.)
T. Riley en A. Action: Music with Balls
E. Siegel: Psychedelevision in Color; Einstein
P. Sorensen: Lumokinetic Paint Set
B. Nauman: Violin tuned D.E.A.D.; Staming in the studio; Bouncing in
a corner.
A. Tambellini: Black Video Two; Black Video; Black gate Cologne; Black
Gate Düsseldorf; Black Air; Black TV.
E. Schmidt jr.: porject 29/n Fernsehen
F. Kriwet: TV-Take II - IX

WCBS-TV te New York: "Limbo", met gebruik van "Chroma-Key" effecten.

KQED in San Francisco laat kunstenaars met video experimenteren: "West
Pole".

Sony brengt draagbare video-apparaten op de markt

In Berlijn oprichting van VACS (Video Audio Culture System)

G. Schum richt de "Fernsehgalerie Schum" op in Düsseldorf (BRD)

1969

W. Vostell: Heuschrecken
L. Levine: Contact: A Cybernetic Sculpture
G. Rühm: 3 Kinematographische Texte (1969-70)
K. Arnatt: Keith Arnatt, WDR Köln van 11 - 18 oktober.
S. Bartlett: Moon
J. Dibbets: TV is a fireplace
P. Weibel: Intermedia Aktionen
Ch. Moorman: TV Bra for living sculpture
Nam June Paik: Electronic Moon

Nam June Paik bouwt een reeks van video-ruimten waar zijn activiteiten
van 1963 tot 1969 worden getoond. Zij worden als onderdeel van de
"Cybernetic serendibity U.S. tentoonstelling in de Corcoran Gallery
te Washington D.C. tentoongesteld.

A. Tambellini: Black; Black Spiral; Television Environmental Electro-
media Performance.

K. Sonnier: Dis-play
Ph. Makana: The Empire of Things
F. Gillette, I. Schneider: Wipe Cycle
B. Nauman: Lip Sinc: Revolving upside down; Pacing upside down
F. Kriwet: Apollovision

Howard Wise Gallery, New York: "TV is a creative medium", eerste
tentoonstelling integraal gewijd aan de TV avant-garde, van 17 mei
tot 14 juni.

WGBH-TV te Boston: The medium in the medium, m.m.v. F. Barzyck, A.
Kaprow, Nam June Paik, A. Tambellini, O. Pienne, J. Seawright, Th.
Tadlock, C. Manos, Tsai, D. Davis, e.a.

ARD, 15 april eerste programma: "Land Art" film van G. Schum m.m.v.
J. Dibbets, W. De Maria, D. Oppenheim, Flanagan, Smithson, e.a.

CBS-producent Don West organiseert "Videogreex": basisleergang voor
de bestudering van de video.

Bouw van een video-studio in het museum Folkwang Essen.

Op het Syracuse Fine Arts Festival worden video-manifestaties ingericht.

1970

V. EXPORT: Split reality
F. Barzyck: Environmental Theater
Nam June Paik, F. Barzyck: Global Grave
Nam June Paik: TV-sculptures, met gebruik van de"Magic Maschine" en de
"Paik - Abe Video Synthesizer".
D. Buren: Störung
J. Dibbets: Painting I / II
P. Weibel: The endless sandwich (TV-Aktion)
K. Sonnier: Positive Negative
H. Nitsch: 7. Abreaktionsspiel
V. Acconci: Corrections
Gilbert + George / Art for All: The Nature of our looking
F.E. Walther: Nr. 29 aus dem 1. Werksatz; Nr. 35 aus dem 1. Werksatz
E. Schmidt jr.: 50/n Fernsehen 2; 51/n Fernsehen 3
M. Merz: Lumaca
F. Kriwet: Con.mix
R. Ruthenbeck: Videosculpture "Papier"
J. Seawright: Two Schönberg Pieces (voor WGBH-TV)
B. Nauman: Videopieces

ARD eerste programma; 30 november: Identification van G. Schum. Mede-
werkers waren o.a.: G. di Dominicis, A. Boetti, K. Rinke, R. Serra,
G. van Elk, J. Beuys, D. Buren, K. Sonnier, M. Hern, L. Weiner,e.a.

Invoering EVR-systeem en Selecta-Vision

Oprichting van de groep Telewissen in Darmstadt (BRD) en van V.A.M.
(video-audio-medium) in Berlin (BRD).

1971

K. Yamamoto: Conformation by doing n° 4
T. Iimura: eerste experimenten met video
W. + B. Hein: Videotape I
K. Rinke: Inhalation I + II Wasser holen bringen schütten; Mutation
H. Rückrien: Teilungen; Kreise; Diagonalen
L. Weiner: Broken Off
D. Oppenheim: Preliminary Text for '65 Vertical Penetration; Hair;
Extended Armor; Fear; Nail sharpening
J. Jonas: Sound Delay; 2 pregnant Women
J. Baldessari: Folding Hot
V. Acconci: talrijke videobanden; o.a.: Association Area; Trials;
contacts.
R. Bowers: Kiss; Mother
J. Dibbets: 3 Diagonals

Aan het NSCAD (Novia Skotia College of Art Department) realiseren
P. Shelly, D. Adhevold, D. Waterman, I. Murray, P. Simmons, e.a.
talrijke video-programma's.

F. Zappa, T. Palmer: 200 Motels; eerste commerciële langspeelfilm,
die gebruik maakt van kleurvideo-band om achteraf op gewone filmband
overgebracht te worden. .

Lijnbaancentrum Rotterdam opent een video-studio, met produktie van
documentaire en didactische banden in samenwerking met D. Oppenheim,
D. Davis, e.a.

Eerste video-theater in New York: "Electric Kitchen" of "The Kitchen"

Corcoran Gallery, Washington D.C. brengt een 'life' voorstelling onder
de titel "Electronic Hokkadim I" van WTOP in Washington

In München oprichting van de groep "Travens Video Workshop" door N.
Franke, C. Rösch en B. Wood.

Het Everson Museum opent een video-afdeling o.l.v. D. Ross

Aan het Finch-College-Museum in New York wordt "Projected Art III"
geopend met video-werken van o.a. Acconci en Campus.

1972

Vanaf 1972 wordt video op brede schaal gebruikt als een zelfstandig
creatief medium. Tot de voornaamste "video-kunstenaars" behoren:
Vito Acconci, David Attwood, John Baldessari, Lynda Benglis, Joseph
Beuys, Alighiero Boetti, Chris Burden, Daniel Buren, Peter Campus,
Douglas Davis, Jan Dibbets, Gino de Dominicis, Juan Downey, Ed En-
shwiller, Terry Fox, Howard Fried, Gilbert & George, Michael Goldberg,
Ralph Hocking, Rebecca Horn, Jeff Hudson, Taka Iimura, Joan Jonas,
Wolf Kahlen, Allan Kaprow, Stephen Kolpan, Les Levine, Walter de
Maria, Mario Merz, Robert Morris, Bruce Nauman, Jack Helson, Dennis
Oppenheim, Nam June Paik, Otto Piehe, Klaus Rinke, Rotterdam Lijnbaan-
centrum, Ulrich Rückriem, Reiner Ruthenbeck, Richard Serra, Ira
Schneider, Willoughby Sharp, Michael Snow, Keith Sonnier, Aldo
Tambellini, Woody Vasulka, Steina Vasulka, Wolf Vostell, F.E. Walther.

"Video-communication do-it-yourself-kit": video-tentoonstelling in
Parijs.

Tijdens de Biënnale van Venetië en Dokumenta V in Kassel (BRD) voor-
stelling van video-activiteiten; o.a. van G. Schum.

"Video-Week": internationale video-tentoonstelling in het American Center te Tokyo.

Oprichting door het NBK (Neuen Berliner Kunstvereins) van een videotheek met banden van Beuys, Kahlen, Vostell, e.a.

WGBH-TV in Boston zendt "Video-Variations" uit.

"One-man-show" door Nam June Paik in het Everson Museum, n.n.v. Ch. Hoorman

Tentoonstelling van K. Sonnier's video-activiteiten in de galerij van Leo Castelli in New York.

1973

Video-tentoonstelling in Graz (A) net o.a. U. Lüthi, N.&S. Dragan, G. Trbuljak, G. Bechtold, G. Baruchello, L. Patella, e.a.

Matrix international video conference te Vancouver.

International festival of women and film 1896-1973 in Toronto. Video-banden van L. Noiseaux-Labreque, F. Forman, San Francisco's Femedia, C. Maheux, J. Dellos, Viva, St. Vasulka, E. Taubellini, e.a.
"Aktionen der Avantgarde" tentoonstelling in Berlin (BRD) van het NBK net video-activiteiten van T. Iimura, A. Kaprow en W. Vostell.

Op initiatief van het museum Folkwang Essen wordt een "video-kooperation Europäischer Kulturinstitute" opgericht; eerste projekt: banden net alle films van L. Moholy-Nagy.

Het Everson-museum richt de tentoonstelling "Circuit: A VideoEnvita- tional" in. Deze tentoonstelling werd gelijktijdig geopend in Seattle, Detroit en Syracuse; nadien in Boston, Los Angeles, Greenville en Köln. Oorspronkelijk bestond deze tentoonstelling uit video-activitei- ten van 50 kunstenaars. Aan het einde werd echter werk vertoond van neer dan 60 video-kunstenaars.

Lijnbaancentrum Rotterdam richt de tentoonstelling "Video" in, net een catalogus waarin een lijst van alle hollandse videogroepen werd afgedrukt.

Oprichting van de galerij "Projection" door U. Wevers in Köln.

Het Museum of Modern Art in New York organiseert, n.m.v. D. Davis, F. Barzyck, e.a. een conferentie met als thema: "Open Circuit – The Future of TV".

In de galerij Ricke te Köln, tentoonstelling met video-banden van J. Jonas, R. Serra, K. Sonnier, B. Nauman, W. Wegman.

G. Bicocchi opent in Firenze een video-galerij en een video-produktie-centrum: "Art/Tapes".

In het Everson-museum toont P. Campus een "Closed Circuit Video".

W. Sharp produceert gedurende twee weken video-voorstellingen in de Green Street 112 te New York. Verdere deelnemers waren C. Burden, U. Rosenbach, K. Sonnier, R. Serra en W. Wegman.

Video-afdeling bij de tentoonstelling "Contempronea", in Parcheggio di Villa Borghese, Roma.

Tentoonstelling "Projekt 74" ingericht door het Wallraf-Richats Museum, de Kunsthalle en het Kunstverein in Köln; met een uitgebreide en belangrijke video-afdeling en catalogus.

Catalogus: Kunst bleibt Kunst: Projekt 74, Köln 1974.
B. Hein: Film in Underground, Frankfurt / Berlin 1971.

BEKNOPTE BIBLIOGRAFIE.

Catalogus: Kunst bleibt Kunst: Projekt 74, Köln 1974.
B. Hein: Film im Underground, Frankfurt / Berlin 1971.
S. Renan: The Underground films, New York, 1967 / London, 1968.
D. Davis: Video obscura, in Artforum, vol. 10 nr. 8, 1972.
D. Davis: Video-art, in Informations and Documents, mei, 1973.
G. Youngblood: Expanded Cinema, New York, 1970
Arts Canada, oktober 1973, speciaal nummer gewijd aan de videokunst, artikels van o.a. J. Bodolai, F. Nakaya, B. Parsons, R. Arn, e.a.
Catalogus: Dokumenta V, Kassel, 1972.
M. Mcluhan: The Medium is the Message, New York, 1967.
Catalogus: TV as a creative Medium, in de Howard Wise Gallery, New York 1969.
I. Hoesterey: Magische Bilder – Fernseh – Experimente in der U.S.A., in Fernsehen + Film, Velder / bij Hannover, september 1970.
C. Aaron: The Video Underground in Art in America, Mei-Juni, 1971.
L. Picard: Die Neuen Künste, in Das Kunstwerk, Stuttgart / Berlin / Köln / Mainz, september 1971.
K. Cooper: Video, an alternative, in Take One, nr. 3, april 1972.
Catalogus: Trigon '73 – Audiovisuelle Botschaften, Graz, 1973.
H.W. Francke, G. Jäger: Apparative Kunst, Köln, 1973.

Samenstelling: J.P. Coenen, I.C.C. Antwerpen.

VIDEO / L'IMAGE ELECTRONIQUE

Conférence - Atelier - Visionnement, réalisés par Jean-Pierre Boyer
au Musée d'Art Contemporain de Montréal (novembre 1974).

La norme et l'alternative

Qu'est-ce qu'une image électronique? L'image électronique est celle
produite par le médium télévision... elle est donc largement diffusée*
par les réseaux commerciaux qui en moins de 25 ans l'ont imposée com-
me un mode privilégié de communication.

Sous sa forme la plus connue, l'image télévisé transmet des contenus,
des informations, des "portions de réalité". Cependant, cette même
image dont, la diffusion massive n'est plus un problème, fait l'objet
depuis peu d'une remise en question.

Ainsi, tandis que certains dénoncent le contenu des émissions produites,
d'autres s'interrogent sur le mode de transmission de ceux-ci. De ces
points de vue, l'image produite par la télévision institutionnelle,
servirait davantage à imposer au spectateur passif une réalité tronquée,
qu'à véritablement l'informer tout en suscitant sa participation.

L'apparition d'un système vidéo-portable**, moins coûteux et plus
maniable que la lourde technologie (hardware) utilisée par la télévi-
sion commerciale, a permis une certaine démocratisation du médium,
indispensable à son requestionnement.

* Répandu dans près de 130 pays, la télévision sera accessible dès
1975 à 1 milliard d'individus... Au Québec, les statistiques de
1973 nous informent que 88% des adultes consomment en moyenne 4,5
heures de télévision chaque jour (ce qui dépasse la moyenne natio-
nale), 98% des foyers ont un appareil tv; 31% en possèdent deux.

** Vidéo-portable: Porta Pak (25 lbs): système magnétoscopique (camé-
ra et magnétoscope) permettant
1) l'enregistrement simultané du son et de l'image
2) la lecture de l'information (image et son/synchrome) emmagasinée
. sur ruban magnétique de 1/2 pouce.

compétition internationale du film expérimental Vijfde internationale co
n de experimentele film   Fifth International Experimental Film Competitic

Knokke-Heist   25.12.1974/2.1.197
                  1974

Het Museum of Modern Art in New York organiseert, n.m.v. D. Davis,
F. Barzyck, e.a. een conferentie met als thema: "Open Circuit – The
Future of TV".

In de galerij Ricke te Köln, tentoonstelling met video-banden van
J. Jonas, R. Serra, K. Sonnier, B. Nauman, W. Wegman.

G. Bicocchi opent in Firenze een video-galerij en een video-produktie-
centrum: "Art/Tapes".

In het Everson-museum toont P. Campus een "Closed Circuit Video".

W. Sharp produceert gedurende twee weken video-voorstellingen in de
Green Street 112 te New York. Verdere deelnemers waren C. Burden, U.
Rosenbach, K. Sonnier, R. Serra en W. Wegman.

Video-afdeling bij de tentoonstelling "Contempronea", in Parcheggio
di Villa Borghese, Roma.

Tentoonstelling "Projekt 74" ingericht door het Wallraf-Richats
Museum, de Kunsthalle en het Kunstverein in Köln; met een uitgebreide
en belangrijke video-afdeling en catalogus.

Catalogus: Kunst bleibt Kunst: Projekt 74, Köln 1974.
B. Hein: Film im Underground, Frankfurt / Berlin 1971.

BEKNOPTE BIBLIOGRAFIE.

Catalogus: Kunst bleibt Kunst: Projekt 74, Köln 1974.
B. Hein: Film im Underground, Frankfurt / Berlin 1971.
S. Renan: The Underground films, New York, 1967 / London, 1968.
D. Davis: Video obscura, in Artforum, vol. 10 nr. 8, 1972.
D. Davis: Video-art, in Informations and Documents, mei, 1973.
G. Youngblood: Expanded Cinema, New York, 1970
Arts Canada, oktober 1973, speciaal nummer gewijd aan de videokunst,
artikels van o.a. J. Bodolai, F. Nakaya, B. Parsons, R. Arn, e.a.
Catalogus: Dokumenta V, Kassel, 1972.
M. Mcluhan: The Medium is the Message, New York, 1967.
Catalogus: TV as a creative Medium,in de Howard Wise Gallery, New
York 1969.
I. Hoesterey: Magische Bilder – Fernseh – Experimente in der U.S.A.,in
Fernsehen + Film, Velder / bij Hannover, september 1970.
C. Aaron: The Video Underground in Art in America, Mei-Juni, 1971.
L. Picard: Die Neuen Künste, in Das Kunstwerk, Stuttgart / Berlin /
Köln / Mainz, september 1971.
K. Cooper: Video, an alternative, in Take One, nr. 3, april 1972.
Catalogus: Trigon '73 – Audiovisuelle Botschaften, Graz, 1973.
H.W. Francke, G. Jäger: Apparative Kunst, Köln, 1973.

David H. Ahl
12 Indian Head Road
Morristown, N.J. 07960
(201) 285-0716

FAX: 201/539 -5934

1962 (GV) Space War on DEC PDP-1 demonstrated in May at MIT open house; written by Slug Russell, Shag Gratz, and Alan Kotok

1962 (T,V) "Talking Typewriter" (computer controls display/ slides/audio for teching reading to young children) developed by Omar Moore at Yale (Harper's, May 1963; Programs.. p 211)

1962 (T) First minicomputer, PDP-5 (forerunner of PDP-8), delivered by DEC

1963 (T,V) Control Data 6600 supercomputer with four video displays introduced (Bit by Bit p 219)

1964 (T) IBM announces System 360 (April)

1964 (T) BASIC developed on GE 225 timesharing system by John Kemeny and Tom Kurtz at Dartmouth College, Hanover, NH

1964 (T,V) CRT display combines computer data with projected background for military simulations, Bunker-Ramo (Sci Am p 246)

1964 (T,V) Computer assisted instruction (CAI) system using CRT with graphics, light pen, and earphones (for audio) developed by Patrick Suppes using IBM hardware, Stanford (Sci Am p 257)

1964 (T,V) Computer art on CRT by A. Michael Noll at Bell Labs

1965 (GA) First educational games in BASIC written for Dartmouth Timesharing System (DTSS)

1966 (All) Amateur Computer Society Newsletter published by Steve Gray (published quarterly until 1976)

1966 (T,V) DEC 338 graphics display introduced

1967 (GV) Pool game developed at RCA

1968 (T,V) Rocket car simulation on CRT display by Judah Swartz, MIT (Sci Am p 61)

1968 (T,V) Computer output and standard television video on same display, Stanford Artificial Intell Lab (SAIL)

1968 (G) "Game Playing With Computers" by Donald Spencer published by Spartan Books/MacMillan & Co.

1969 (T,V) Flight simulation to/from aircraft carrier on Evans & Sutherland display, Naval Training Device Center

1969 (GA,V) Lunar lander game on PDP-8 at Digital Equipment Corp., later modified for GT40 video terminal

1969 (GA) Secondary school science and social studies simulations in BASIC by Ludwig Braun, Huntington Computer Project, Brooklyn Poly, NY

1970 (GA,V) "Game of Life" by John Conway reported by Martin Gardner in Scientific American, Oct.; within a month, many video computer programs of the game appeared

David H. Ahl
12 Indian Head Road
Morristown, N.J. 07960
(201) 285-0716

1971 (T) IBM introduces first floppy disk (8")

1971 (GV) Computer Space coin-op game (Nov.) by Nolan Bushnell at Nutting Associates

1971 (T) First commercial computer kit, Nat'l Radio Institute 832

1971 (T) Intel introduces 4004, first microprocessor chip

1972 (GV) Odyssey 1TA200 analog home video game introduced by Magnavox

1972 (GV) Pong coin-op game (Nov.) by Nolan Bushnell at Syzygy, later to become Atari Corp.

1972 (GA) Adventure game by Willy Crother and Don Woods for DEC PDP-10, Xerox and Stanford

1972 (O) People's Computer Company newsletter published (Oct.) by Bob Albrecht of Dymax, Menlo Park, CA

1973 (GA) "101 Basic Computer Games" by David Ahl published (July) by DEC; first computer book to sell 1 million copies

1973 (T) "TV Typewriter" article by Don Lancaster published in Radio Electronics

1973 (T) Intel introduces 8008, first 8-bit microprocessor; followed in 1974 by 8080 with much larger instruction set

1973 (T) Scelbi-8H computer kit offered for $1149 with 4K memory

1974 (T) Plans for Mark-8 (8008) computer kit published in Radio-Electronics (July)

1974 (All) "Computer Lib/Dream Machines" by Ted Nelson published

1974 (All) Creative Computing magazine published by David Ahl (Nov.)

1975 (T) MITS Altair computer kit featured on cover of Popular Electronics (Jan.)

1975 (T) BASIC language written for MITS Altair by Bill Gates and Paul Allen; later Gates and Allen found Microsoft

1975 (GV) Pong (self-contained home version) introduced by Atari at Summer Consumer Electronics Show (CES) in June

1975 (T,V) TV Dazzler board from Cromemco adds color and graphics to Altair and other S-100 bus computers using standard TV set

1975-6 (T) Many hobbyist computers introduced: IMSAI, Processor Technology, Polymorphic, Southwest Technical Products, Sphere, KIM-1

1976 (GV) Sea Wolf coin-op game introduced by Bally/Midway

1976 (GV) Many dedicated home video games introduced

David H. Ahl
12 Indian Head Road
Morristown, N.J. 07960

1976 (T) First hobbyist computer show, PC '76, held in Atlantic City (August)

1976 (GV) Fairchild introduces Channel F, first home video game with removable cartridge; Bally Professional Arcade home game also introduced

1977 (T) First self-contained assembled computers introduced: Apple II, Commodore PET, Radio Shack TRS-80 Model I

1977 (GV) Atari introduces Video Computer System (VCS)

1977 (GV) Space Wars, first "vectorbeam" coin-op game, introduced by Cinematronics

1978 (GV) Space Invaders coin-op game introduced by Taito in Japan and Bally/Midway in USA

1978 (T,V) First digitizer (Summagraphics) and video imaging system (Micro Works) for microcomputers

1979 (GV) Mattel introduces Intellivision home game system

1980 (GV) Pac-Man coin-op game introduced by Namco in Japan and Bally/Midway in USA

1980 (T) Sinclair ZX-80 first microcomputer under $200

1981 (T) IBM announces IBM PC

1982 (T) Commodore 64 announced

1982 (G) Peak year for video and computer games

1983 (GV) Nintendo game system introduced in Japan

1985 (CV) Nintendo Entertainment System (NES) introduced in USA

Codes:
T   Technology
V   Video
G   Games
GA   Games, alphanumeric
GV   Games, video

CRONOLOGIA

1959/1964	– Primeres experiències pre-video a carrec de Wolf Vostell i Nam June Paik. TV.- Decollages, manipulació de les imatges de la TV per mitjans electrònics i magnètics:

1959. Vostell: "Fernseh-De-Coll/Age Fuer Milliones" (primer TV-decollage)

1963. Exposicions de Paik i Vostell a la Galerie Parnasse (a Wuppertal) i a la Smolin Gallery (N.Y.) respectivament.

1964. Vostell: "Sun in your head" (TV- decollage filmat en 16 mm.)

1965   – Nam June Paik utilitza per primera vegada un magnetoscopi portàtil i passa després les escenes captades, al Café-au-Gogo del Geenwich Village.

1967   – La Rockefeller Foundation concedeix una subvenció de 275.000 $ a la WGBH-TV de Boston, a fi que fomenti la creativitat artística a la televisió.

– La KQED-TV de San Francisco crea el primer estudi de video en el qual realitzen diversos treballs, Brice Howard, Paul Kauffmann, Terry Riley, Loren Sears i Robert Zagone.

– La WNET-TV de NEW YORK crea també un estudi experimental de video.

1968   – Sony llença al mercat mundial el 'Portapack' (Magnetoscopi portàtil)

– El Marshall Mc Luhan's Center for Understanding Media de la Fordham University de New York promociona els 'Portapacks'

– James Newmann transforma la seva galeria d'art de tipus convencional, per tal de dedicar-la a la promoció del video; realitza amb la col.laboracio de la KQED-TV de San Francisco la sèrie de programes titulada "Open Gallery". Hi participen gent com Julian Beck, Walter De Maria, Ken Dewey, Robert Frank, Ann Halprin, Philip Makanna, Robert Nelson, Yvonne Rainer, Terry Riley, Edwin Schlossberg i Frank Zappa.

– Andy Warhol utilitza el video, realitza un anunci de TV d'una durada d'un minut: "The Underground Sundae", per a la casa de gelats "Schrafft".

– Otto Piene i Aldo Tambellini realitzen "Black-Gate Cologne" per al 3 er. programa de la WDR alemanya. Segons Douglas Davis es, possiblement, el primer programa realitzat per artistes per a la difusió normal per TV (a primers de 1969).

1968 — Exposició de Bruce Naumann a la Nicholas Wilder Gallery (Los Angeles). Segons David A. Ross es produeix per primera vegada la venda d'un video-tape fet per un artista.

— Gerry Schum obre el primer centre especialitzat en l'explotació comercial del video.

1969 — Gerry Schum presenta la sèrie 'Land-Art' a la TV alemanya; hi participen: Long, Flanagan, Dibbets, De Maria, Oppenheim i altres.

— "TV as a Creative Medium" a la Howard Wise Gallery. Es pot considerar com la primera gran exposició dedicada al video-art. Hi participen:
Serge Boutourlino, Frank Gillette, Charlotte Moorman, Nam June Paik, Paul Ryan, Ira Schneider, Aldo Tambellini, Joe Weintrawb i altres.

— La sèrie titulada "The Medium is the Medium", de la esmentada subvenció de la Rockefeller Foundation, es difon pel USA, presentant obres de Douglas Davis, Allan Kaprow, Nam June Paik, Aldo Tambellini i altres.

— Wolf Vostell, Mauricio Kagel i Jan Dibbets realitzen programes a la televisió alemanya.

1970 — Gerry Schum presenta la sèrie 'Identification' a la televisió alemanya. Hi participen: Beuys, Rinke, Sonnier, Serra, Weiner, Buren, Gilbert and George, Anselmo, Calzolari, De Dominicis, Merz i altres.

— Nam June Paik inventa el video-sintetizador, amb la col.laboració de Shuya Abe.

— "Body Works", video-exhibicions al Breen's Bar de San Francisco. Hi participen Acconci, Fox, Nauman, Oppenheim i altres.

— Apareix la revista 'Radical Software', especialitzada en video.

— Apareix el llibre 'Expanded Cinema', de Gene Youngblood.

1971 — El Finch College Museum of Art de New York patrocina l'estudi i la utilització del video.
— Important participació de video-artistes al New York Avant Garde Festival.

— Fundació del "Videographe" a Montreal, per iniciativa de Roger Forget i amb la protecció de la Oficina Nacional del Film.

— S'autoritza oficialment la fundació, a Nova York d'un canal lliure per cada companyia emisora de TV en la qual es possible de passar les emisions realitzades pels mateixos ciutadans.

1971	- Antoni Muntadas entra a la Galeria Vandrés de Madrid dues càmeres video i quatre monitors.
	- Creació d'un estudi de video al Lijnbaancentrum de Rotterdam.
	- Publicació del llibre "Guerrilla television", de Michael Shamberg i Raindance Corporation.
	- S'institueix el primer departament de video en un museu, el Everson Museum of Art de Syracuse, estat de New York.
1972	- Firts Women's Video-Festival a la Kitchen Gallery de New York.
	- Creació de la "Videothek" del Neven Berliner Kunstverein a Berlin.
	- Luciano Giacoari inicia la producció de videos a Varese (Italia).
	- Howard Wise funda "Electronic Arts Intermix".
	- A la Documenta 5 de Kassel hi participen amb un video titulat "Umformung Eines Raumes", en Francesc Abad, Jordi Benito, Robert Llimós i Antoni Muntadas.
1973	- Presentació a Paris del "Videographe", dintre de la mostra "Canada Trajectoires'73".
	- Accions-video de Vostell, Kaprow i Iimura, dintre del programa "Aktionen der Avantgarde" al Neven Berliner Kunstverein.
	- "Trigon '73- Audiovisuelle Botschaften" a Graz (Austria). Participació d'artistes austriacs, italians i iugoslaus.
	- Predomini del video-art al Annual New York Avantgarde Festival.
1974	- "Cadaqués. Canal Local". Antoni Muntadas.
	- "Tallers de Treball amb videotape" a la Sala Vinçon, dirigit per A. Muntadas i Bill Creston.
	- "Art Video Confrontation '74", dins del marc del Festival d'Automne de Paris.
	- "Impact Art Video", organitzat per la Gallerie Impact, de Lausanne.
	- Activitats d'Antoni Muntadas a la Galeria Vandrés de Madrid. Taula rodona titulada "El video como medio de expresión, comunicación e información" en la qual hi prenen part, René Berger, Juan Manuel Bonet, A.Cirici, A.Corazón, Simon Marchán, A.Muntadas i altres

1974	- "Projekt 74" a Colonia.
	- "Exprmntl 5" a Knokke- Heist (Bélgica).

1975
- A la Galeria La Clau de Granollers, el Grup de Treball presenta l'obra titulada "Granollers, vila oberta".

- "Artist's Videotapes" al Palais des Beaux-Arts de Bruselas. Hi participen 130 autors.

- Predomini del video a la Fira Internacional d'art de Basel (Art 6'75) i a la Biennale de Paris.

- El CAYC (Centro de Arte y Comunicación, Buenos Aires, Argentina) organitza diverses trobades internacionals sobre video.

- A l'Institut of Contemporary Art de la Universitat de Pennsylvania es presenta l'exposició "Video-Art".

1976
- El laboratori de TV de WNET/ Channel 13 de New York, inicia la presentació semanal d'una sèrie de programes experimentals produits a diversos centres o per artistes independents.

- El grup Videofreex presenta 525 video-tapes a l'Anthology Film Archives, a New York.

- Dins del marc de la trobada en torn al tema "Barrios de Las Palmas", organitzat pel Colegio de Arquitectos de Canarias, es presenten Videos de Tino Calabuig.

- Mostra de videos dintre de l'exposició de l'Ambit de Recerca: "Art amb nous mitjans" a la Fundació Miró de Barcelona.

BIBLIOGRAFIA

A/. __General__

Berger, René — La mutation des signes. Ed. Denoel
París, 1972.

Id. — El video-arte. Paradojas y desafios.
Musée des Beaux-Arts. Palais Rumine
Laussane. Agost, 1974 (Reproducció
fotocopiada).

Id. i altres — El video como medio de expresión,
comunicación e información. Galeria
Vandrés, 17 de desembre 1974. Madrid.
(Transcripció del col.loqui)

Bourbage, R.
Cazemajou, J.
Kaspi, A.
— Presse, Radio et Télévision aux
Etats-Unis. Ed. Colin. París 1972.

D'Amico, M. — Lo audiovisual en expansión. Ed. Monte
Avila. Caracas, 1971.

Douglas Davis: — Art and the Future. Praeger Publ.,
New York

Fages, P. — Diccionario de los medios de comu-
nicación técnica, semiológica, lin-
güística. Ed. Fernando Torres.
Valencia, 1975.

Hopkins, J.
Evans, C.
Hetman, S.
Kerk, J.
— Video in comunity Development.
Journal of the Centre for advanced
Television Studies. Vol. I nº 1
Londres. Gener, 1973.

Informations et Documents. Revue des Services
américaines d'Information et de
Rélations culturelles. n. 330
París, maig 1973.

Kiefer, J.C. — Naissance d'un medium. La video
cassette. Ed. Mame. Tours, 1973.

Ortmayer, R. — Software, Hardware und die Kunsler.
Die Primitiven einer reuen Sensibi-
lität   (Manuscrit)

H. Scheugl
E. Schmidt jr.
— TV . A "Eine Subgeschichte des Films.
Lexikon des Avantgarde-, Experimental und
Underground- Films" (vol. 2).
Ed. Suhrkamp. Frankfurt, 1974.

B/. **Tecnologia**

Besinger, Ch.   Video tape recording. Petersen Publ.
i altres   Los Angeles, 1973.

Bernhardt, J.   Boîte à images et marché des vidéogrammes
Alain-Dupre, P.   n. 28 París, desembre, 1972.

C.N.A.A.V.   ABC de la video. La documentation
                     française. París, 1974.

Enregistreurs et lecteurs vidéo à usage domestique
                     Union Européenne de Radiodifution.
                     Centre technique. Brusel.les, 1971.

False, H.   La Videocassette. Service de la
Gregory Brive,S.   Recherche de l'ORTF. París, 1972.

Richard Robinson: The Video Primer. Links Books, New York

The Videocassettes and the Videodisc. Systems and
                     Market 1972. Analysis and Forecasts.
                     International Publishers Audiovisual
                     Association. Zurich, 1972.

Videofreex   The spaghetti city video manual
                     Praeger Publ. New York, 1973.

C/. **Video com informacio, guerrilla, etc.**

C.N.A.A.V.   Teledistribution et video animation.
                     La situation française/ La situation
                     etrangère. Vol. I-II. La documen-
                     tation française. París, 1974.

Cooper, K.   Videotape: focals on global village
                     A 'Filmmakers newsletter' n. 3
                     New York, 1972.

Consequences de l'emploi des technologies vidéo pour
                     l'education et la culture.
                     Seminari 2-6 maig. Vichy, 1972.

Gauthier, G.   Télévision pasive - Télévision active
Pilard, Ph.   Tema. París, 1972.

Gordon, G.N.   The videocassete technology in American
Falk, J.   education. Educational Technology Publi-
                     cations. New Jersey, 1972.

Leedham, J.   The videocassette, some Experience and
                     a Estimate of its educational Potential
                     A 8 th mediorama for the development of
                     industry and labor. Blankenberghe. Maig, 1973.

Observation by Television in Teacher Education, with Special Reference to the word of the ILEA'S Mobile Videotape Recording Section Inner London Education Authority. Educational Television Service Londres, gener, 1972.

Oille, J. Video politics. A 'Art and artists' n. 104, Londres, novembre, 1974.

Procedings of Video Publishing Year III. Knowledge Industry Publications Inc. New York, 1972.

Shamberg, M. Guerrilla television. Holt Reinhard and Winston. New York, 1971.

Willener, A. Video et societé virtuelle.
Milliard, G Tema. Paris, 1972.
Ganty, A.

D/. Art-video

Aaron, Ch. The video underground. A 'Art in America'. New York, maig-juny, 1971.

Battcock, G. The greening of video and the aesthetics of Boeing. A 'Domus' n. 54. Mila, abril, 1972.

Bloch, D. Art video. A 'Opus' n. 54
Eizyckman, C. Paris, gener, 1975.
Fihman, G.
Pavie, Y.

Berger, R Télévision(s) et creativité. A 'Comunications', n. 21. Ed. Seuil. Paris, 1974.

Davis, D. Video obscura. A 'Artforum' New York, abril, 1972.

Davis, D. Video-art. A 'Informations et Documents' n. 330. Paris, maig, 1973.

Id. Art in the future. Praeger Publ. New York, 1973.

Dols, J. Art-video. Institut Alemany.
Mercader, A : Barcelona, 1976.

Frankie, W. Apparative Kunst. Ed. Du-Mont.
Jager, G. Colònia, 1973.

Graham, D. Architecture/video projects. A 'Studio International'. Londres. Setembre-octubre, 1975.

Gillette, F. Between paradigms. Gordon and Breach. New York, 1973.

Kaprow, A.   Old wine, new bottle. A 'Artforum'.
                     New York, Juny 1974

Rosalind Krauss: Video: The Aesthetics of Narcissism, en
                     October, nº 1. New York, 1976.

Richard Kriesche (ed.): Video End. Pool Pfirisch, Graz 1976.

Lippard, L.   Six years: the dematerialization
                     of the art object from 1966 to 1972.
                     Praeger. Publ. New York, 1973.

Margolies, J.   TV- the next medium. A 'Art in America'.
                     New York, setembre-octubre, 1969.

Moles, A.A.   Arte de sistema e video arte. A 'D'Ars'
                     n. 75 Milà, juliol, 1975.

Renzio,Toni del   The TV aesthetic. A 'Art and artists'
                     n. 104. Londres, novembre 1974.

Restany, P.   Synthetiseur video. A 'Domus', n. 533
                     Milà, abril 1974.

Id.   Le videomonstre. A 'Domus' n. 547
                     Milà, juny 1975.

Id.   Arte sociologica. A 'Domus' n. 548
                     Milà, juliol 1975.

Sanna, J. de   Videotape funziona A 'Domus' n. 534
                     Milà , maig 1974.

Id.   Video against video. A 'Domus' n. 543
                     Milà, febrer 1975.

Trini,Tommaso   Di videotape in videotape. A 'Domus'
                     n. 495. Milà, febrer 1971.

Id.   Dan Graham. A 'Domus' n. 519
                     Milà, febrer 1973.

Id.   Artvideo e multivision.'D'Ars' n. 75
                     Milà. Juliol, 1975.

Yalkut, J.   An interview with Frank Gillette and
                     Ira Schneider. A 'East Village Other'
                     New York. Agost 1969.

Youngblood, G.   Expanded cinema. E.P. Dutton.
                     New York, 1970.

Varis: Video-Art. Studio International, Londres,
                     maig-juny, 1976.

E/   Revistes especialitzades.

Acces (Ottawa)
Aquarian Angel (Woodstock)
Art-Cinema (New York)
Artitudes (Saint Jeannet)
Audio visual communications (New York)
Avalanche (New York)
Bulletin for film and video information
(Anthology Film Archives) (New York)
CTV Report (Londres)
Data (Milà)
Flash Art (Milà)
Education or culture (Strasbourg)
Kunstforum (Mainz)
Intermedia (Londres)
La Mamelle (San Francisco)
Le journal de l'audio visuel (París)
Medium media (Montreal)
Media (Paris)
Newsletter for open chanel (New York)
Opus International (París)
Radical Software (New York)
Screen Digest (Londres)
Sonovision (Paris)
Studio International (Londres)
Television Digest (Washington)
Video Info (París)
Video tools (New York)
Videocassette and CATV news letter (Beverly Hills)

F/   Catàlegs d'art-video

TV as a creative medium. Howard Wise Gallery.
New York, 1969
Work from the experimental television center.
Everson Museum of Art. Syracuse, New York, 1972
Events-Drawings-objects-videotapes. Douglas Davis.
Everson Museum, Syracuse. New York, 1972
Video: process and meta process. Frank Gillette.
Everson Museum. Syracuse, New York, 1973
Video'n videology 1959-1973. Nam June Paik.
Everson Museum of Art. Syracuse, New York, 1973
Video art/estética televisual. Museo de arte Moderno
de Chapultepec. 1973
Trigon '73-audiovisuelle botschaften. Graz, 1973
Impact video-art 74. Gallerie Impact. Lausanne, 1974.
Exprmntal 5 video-knokke/heist. Media Study.
Bufalo (New York), 1974
Art/ video confrontation 74 ARC 2-CNAAV. París, 1974
Foto-film-video. Gallerie Falazik. Nevenkirche, 1975
The Kitchen 1974-75. Haleakala Inc. New York, 1975
Video. Galeria Wspolczesna. Varsovia, 1975
Arte de video. Fundación de arte contemporaneo.
Caracas, 1975
Video art USA. XIII Bienal de Sao Paulo. 1975
Rencontre internationale ouverte de video.
Espace Pierre Cardin. París, 1975
Artist's videotapes. Palais des Beaux-Arts. Bruseles, 1975
Land-Art. Gerry Schum. 1969

TIMELINE

1963
--Wolf Vostell, *Television Décollage*, Smolin Gallery, NYC

1964
--WGBH, Boston, Fred Barzyk, *Jazz Images*

1965
--Nam June Paik, *Electronic Art*, Galeria Bonino, NYC
--*New Cinema Festival I*, John Brockman (org.), Filmmakers Cinemateque, NYC

1966
--*9 Evenings: Theater and Engineering*, NYC, 69th Regiment Armory, org. Billy Kluver (v. projection in work by Alex Hay, Robt Rauschenberg, David Tudor, Robt Whitman)
--Ken Dewey, Bruce Davidson, Terry Riley, *Selma Last Year*, NY Film Festival

1967
--*Light, Motion, Space* (includes Paik, Tambellini, more), Walker Art Center with Howard Wise Gallery, NY
--*Festival of Lights* (includes Serge Boutourline, Paik, Tambellini, Howard Wise Gallery, NY (light works, video)
--Rockefeller Foundation awards first video fellowships
--Nam June Paik, *Electronic Blues*, Howard Wise Gallery NY (installation)
--WGBH, Boston, AIR program ($ from Rockefeller)
--WGBH, *What's Happening, Mr. Silver?* David Silver host (experimental live mix)
--KQED, SF, Experimental Television Workshop, Brice Howard & Paul Kaufman, dir. ($ from Rockefeller) (in 1969 renamed Natl Ctr for Experiments in Television--NCET--funded by CPB and NEA. Ends 1976)
--portapaks marketed by Sony

1968

--Aldo Tambellini, *Black Video*, Brooklyn Museum (in *Some More Beginnings* organized by Experiments in Art & Technology)
--Nam June Paik, *Electric Art II*, Galeria Bonino, NY
--*Intermedia 68*, John Brockman (org), Brooklyn Academy of Music (Theater workshop for Students and BAM, $ from NYSCA, work by Ken Dewey & Jerry Walterm, Les Levine & George Fan, Tambellini)
--Les Levine, *Iris*, artist's studio (installation)
--*The Machine as Seen at the "End of the Mechanical Age"*, MOMA, Pontus Hulten (org) (tape loop installation by Paik)

--*Time Situation*, David Lamelas (in *Beyond Geometry*), Center for Inter-
    American Relations
--*Cybernetic Serendipity: The Computer & the Arts*, Corcoran Gallery, WDC
    (originated at ICA London)
--Black Gate Theater established for electromedia events by A. Tambellini
--Commediation collective established--ends 1969 (David Cort, Frank
    Gillette, Howard Gudstadt, Ken Marsh, Harvey Simon)
--Young Filmmakers/Video Arts established, Roger Larson, dir.
--Ant Farm, SF--ends 1978 (Chip Lord, Doug Michels, Curtis Schreier, Kelly
    Gloger, Joe Hall, Hudson Marquez, Allen Rucker, Michael Wright)
--Land Truth Circus (later T. R. Uthco)--ends 1978 (Doug Hall, Diane Hall,
    Jody Procter)
--Electric Eye collective, Santa Clara, CA--ends 1970 (Tim Barger, Jim
    Mangis, Jim Murphy, Michelle Newman, Skip Sweeney)
--*The Underground Sundae*, Andy Warhol (60 sec. commercial for Schrafft's
    Restaurant, NYC)
--*Sorcery*, Loren Sears & Robert Zagone for WQED, Experimental TV
    Workshop, SF

1969
--*TV as a Creative Medium*, Howard Wise Gallery (first gallery devoted
    entirely to video art) (work by Boutourline, Gillette, Schneider, Paik&
    Moorman, Earl Reiback, Paul Ryan, John Seery, Eric Siefel, Thomas
    Tadlock, Tambellini, Joe Weintraub)
--*Corridor*, Bruce Nauman, Nicholas Wilder Gallery, LA
--Center for Advanced Visual Studies established at MIT, Gyorgy Kepes, Otto
    Piene, dir.
--Channel One, NYC, video theater, comedy (Chevy Chase, Ken Shapiro, dir.)
--Global Village, NYC, video collective, screenings (founded by John Reilly,
    Ira Schneider, Rudi Stern, Julie Gustafson)
--Raindance Corp. collective established (members Gillette, Michael
    Shamberg, Steve Salonis, Marco Vassi, Louis Jaffe, Ira Schneider, Paul
    Ryan, Beryl Korot)
--Videofreex established (Skip Blumberg, Bart Friedman, Nancy Cain, David
    Cort, Davidson Gigliotti, Chuck Kennedy, Curtis Ratcliff, Parry
    Teasdale, Carol Vontobel, Tunie Wall, Ann Woodward)
--WGBH, *The Medium is the Medium*, produced by Fred Barzyk, Anne Gresser,
    Pat Marx (first presentation of works by independent artists on TV--
    Kaprow, Paik, Piene, Seawright, Tadlock, Tambellini)
--CBS, *Subject to Change*, produced by Don West & Videofreex (never
    broadcast)

1970

--Les Levine, A/R, Jewish Museum (cur. Jack Burnham) (installation)
--Information, MOMA, cur. Kynaston McShine (installations & tapes from US, Europe, Latin Am)
--Keith Sonnier, installation in *Warehouse Show*, Leo Castelli (cur, Robt Morris?)
--*The First Gathering, Alternate Media Project* media conference, Goddard College
--*Body Works*, Museum of Conceptual Art, SF (first video exhibition on west Coast, org by Willoughby Sharp) (work by Acconci, Terry Fox, Nauman, Oppenheim, Sonnier, Wegman)
--*Philo T. Farnsworth Video Obelisk*, Skip Sweeney, installation at Intersection Theater, SF?
--*Vision and Television*, Rose Art Museum, Brandeis University (cur. Russell Connor (work by Gillette, Eugene Mattingly, Paik & Moorman, Reilly & Stern, Ryan, Schneider, Siegel, Tambellini, Jud Yalkut, USCO/Intermedia, Videofreex)
--Experimental Television Center established in Binghamton, NY, Ralph Hocking & Sherry Miller, dir. (moves to Owego in 1979)
--Media Access Ctr (Portola Institute), Menlo Park, CA, alternate TV emphasis on high school and community projects--ends 1972 (members: Pat Crowley, Richard Kletter, Allen Rucker, Shelly Surpin)
--CAPS video fellowships, NY State
--Electronic Arts Intermix founded by Howard Wise , 1972 adds post-production facility, 1973 adds tape distribution
--NYSCA forms TV Media Program (dir include Peter Bradley, Paul Ryan, Russell Connor, Gilbert Knishi, Lydia Silman, Nancy Legge, John Giancola)
--People's Video Theater video journalism collective (conducted weekend screenings where audience discussions are replayed) (Elliot Glass, Ken Marsh and Judy Fiedler, Howard Gudstadt, Molly Hughes, Ben Levine, Richard Malone, Elain Milosh, Richard Nusser)
--Museum of Conceptual Art (MOCA), SF established by Tom Marioni (alternative museum created for performance, multimedia art)
--Video Free America established, SF, by Arthur Ginsberg, Skip Sweeney, dir Joanne Kelly, Skip Sweeney
--Synapse Video Center, Syracuse, NY, established (formerly University Community Union Video) for production and post-production, dir Lance Wisniewski, Henry Baker. (closes 1980)
--Paik and Shuya Abe develop Paik/Abe synthesizer while AIR at WGBH
--WGBH, Stan VanDerBeek, *Violence Sonata* (live broadcast perf, phone-in on theme of violence)
--Eric Siegel builds Electronic Video Synthesizer ($ from Wise), NY
--Stephen Beck builds Direct Video Synthesizer 1 ($ from NEA), SF

-- *Film & Video Makers Travel Sheet* published by Carnegie Museum, Pittsburgh
-- *Radical Software* published by Raindance 1970-74 (co-editors Phyllis Gershuny, Beryl Korot)
-- *Expanded Cinema* by Gene Youngblood--first publication to cover video art

1971
-- *Tapes From all Tribes* at Pacific Film Archives, Berkeley, org by video Free America (exhibition of over 100 tapes)
-- *The Television Environment* at University Art Museum, Berkeley, produced by William Adler, John Margolies (AFA tour)
--access channels begin on cable in NYC

1972
--access channel requirements set forth in federal law

--*Film & Video Makers Travel Sheet* published by Carnegie Museum,
        Pittsburgh
--*Radical Software* published by Raindance 1970-74 (co-editors Phyllis
        Gershuny, Beryl Korot)
--*Expanded Cinema* by Gene Youngblood--first publication to cover video art

1971
-- *Tapes From all Tribes* at Pacific Film Archives, Berkeley, org by Video
        Free America (exhibition of over 100 tapes)
-- *The Television Environment* at University Art Museum, Berkeley, produced
        by William Adler, John Margolies (AFA tour)
--access channels begin on cable in NYC

1972
--access channel requirements for cable franchises set forth by FCC
-- *1st Annual Nat'l Video Festival* MCAD & Walker Art Center (panel=Campus,
        connor, Emshwiller, Paik, Barbara Rose, Schneider, Stoney,
        Tambellini, Youngblood (org. Tom Drysdale)
--Peter Campus, one-man show, installations at Bykert Gallery, NYC
-- *1st Women's Video Festival* The Kitchen (org Susan Milano) (work by
        Jackie Cassen, Maxi Cohen, Yoko Maruyama, Susan Milano, Queer Blue
        Light Video, Keiko Tsuno, Steina & Woody, Women's Video Collective
-- *9th Annual NY A-G Festival* (dir Charlotte Moorman), 15 artists
-- *1st St Jude Invitational of Video Art* at Univ Santa Clara (org David
        Ross) works by Benglis, Baldessari, George Bolling, D. Davis, Taka
        Iimura, Videofreex, Wegman
--*Douglas Davis: Exhibition Inside & Outside the Museum* at Everson Museum,
        Syracuse, with WCNY-TV (live telecast="Talk Out!")
--Nam June Paik, at Everson tapes, installations, performance w/ Moorman
--Media Study/Buffalo established. Gerry O'Grady, dir., John Minkowsky, cur.
--Castelli-Sonnabend Videotapes & Films established (dist service) Joyce
        Nereaux & Patricia Brundage, dir
--Downtown COmmunity TV established (educ & production) Founded by Jon
        Alpert & Keiko Tsuno
--Fifi Corday Productions (assist astists' productions) Founded by Carlotta
        Schoolman
--Survival Arts Media (video collective emphasizing community educ &
        health, artists processes, multimedia shows) Members Gail Edwards,
        Howard Gudstadt, Holly Hughes, Bob Levine, Danny Luciano, Richard
        Malone
--Portable Channel, Rochester (resource ctr--workshops, visiting artists

access, productions) Directors: Bonnie Klein, Sanford Rockowitz, John Camelio, Robert Shea, Tim Kelly

--Double Helix, St. Louis (media ctr--production, post-prod)
--Optic Nerve, SF (documentary production collective) Members: Lynn Adler, Jules Backus, Jim Mayer, Sherrie Rabinowitz, John Rogers, Mya Shone (ends 1979)
--Top Value TV (TVTV) (doc coll forms to provide alternative coverage of Dem and Rep conventions; 1st use of half-inch tape on broadcast TV; original production by Hudson Marquez, Allen Rucker, Michael Shamberg, Tom Weinberg, Megan Williams, Ant Farm, Raindance, Videofreex; other members: Wendy Apple, Michael Couzens, Paul Goldsmith, Betsy Guignon, Stanton Kaye, Anda Korsts, Andy Mann, Elon Soltes (ends 1977)
--Woodstock Community Video, Woodstock, NY (production and community video resource; initiates local cable programming). Founded by Ken Marsh; members include Barbara Buckner, Bob Dacy, Gary Hill, Steven Kolpan, Elaine Milosh. Begins Artists' TV Lab which moves to Rhinebeck in 1976; 1975-77 presents *Woodstock Video Expovision*, a festival of NY State artists. (ends 1978)
--*Music Image Workshop*, WGBH, by Ron Hays using Paik-Abe synthesizer
-- *The Very First on-the-air-Half-Inch Videotape Festival Ever: People Television*, WGBH, produced by Henry Becton with Fred Barzyk, Dorothy Chiesa (live studio event w/call ins and interviews with artists, engineers, educators, business people, students
--Dan Sandin builds Image Processor in Chicago, works with Phil Morton to make available to artists
--Television Laboratory at WNET/Thirteen established with grants from Rockefeller Found and NYSCA. Dir David Loxton, Carol Brandenburg. (Artists include Shirley Charke, Douglas Davis, Emshwiller, Paik)
--*Scape-Mates* by Ed Emshwiller at WNET/Thirteen (complex mixing of live actors and computer graphics)
--*Electronic Notebooks* by Stephen Beck at KQED, SF, in conjunction with Bill Gwin, Con Hallock, Warner Jepson, Bill Roarty, W. Rosenquist)

-- *Between Paradigms: The Mood & Its Purpose* by Frank Gillette
--*Print* (NY: RC Publications) special video issue guest editor: Robert deHavilland, contributors Fred Barzyk, Rudi Bass, Rose DeNeue, Bernard Owett, Sheldon Satin, Michael Shamberg

1973
--William Wegman exhibition at LA County Mus of Art
-- *International Computer Arts Festival* at The Kitchen at Mercer Arts
Center, org by Dimitri Devyatkin

--*The Irish Tapes* by John Reilly & Stefan Moore, installation at Kitchen
--*1973 Whitney Biennial*, first inclusion of video (7 artists)

-- *10th Annual A-G Festival* at Grand Central; dir; C. Moorman (17 video
        projects)
--*Circuit: A Video Invitational*, EVerson, cur by David Ross (travelling
        exhibition with 65 artists)
--*Frank Gillette: Video Process & Meta-Process* at Everson
--UI at Chicago Circle initiates video/computer graphics course taught
        by Dan Sandin & Tom DeFanti
--University Community Video, Minneapolis estab (independent production)
--Cable Arts Foundation founded by Russell Connor, NY (production & dist
        of anthology & art series to cable systems)
--Visual Resources estab, dir Eva Kroy Wisbar (distr/info service includes
        video; publishes *Art & Cinema*)
--*Northwest Film & Video Festival* estab by NW Film Study Ctr; dir Robt
        Sitton & Bill Foster
--Media Center estab at Visual Studies Workshop, begins publication of
        Afterimage, dir Nathan Lyons; media center coord include Wayne Luke
        Laddy Kite, Arthur Tsuchiya, Nancy Norwood
--Steve Rutt and Bill Etra develop Rutt/Etra scan processor, NY
-- *Videola* at SF Mus Art, Environmental sculpture by Don Hallock with
        multiple displays of works created at NCET, KQED (work by Beck,
        Turner, Gwin, Jepson, Hallock)
--*Spaghetti City Video Manual* published by Videofreex (NY: Praeger)

1974
-- *1st Annual Ithaca Video Festival* by Ithaca Video Projects (tours in 76)
--*Collector's Video* at LA County Mus of Art; org by Jane Livingston, work
        by Baldessari, Campus, Fox, Gillette, Holt, Jonas, Kos, Richard
        Landry, Mann, Morris, Nauman, Serra, Sonnier, Wegman
--*New Learning Spaces & Places* at Walker Art Center; work by Gillette,
        Byrne, Campus, Downey, Mann, Schneider, UCV, Wegman
--*Open Circuits: The Future of TV* at MOMA, org by Fred Barzyk, Davis,
        O'Grady, Willard Van Dyke. International video conference including
        educators, cable, artists, critics
--*Projects: Video* at MOMA, cur Barbara London; beginning of ongoing
        series of video exhibitions (Rockefeller funding in 1976)
-- *Video Performance* at 112 Greene Street; work by Acconci, Beuys,
        Chris Burden, Dennis Oppenheim, Ulrike Rosenbach, Serra & Robt
        Bell, Willoughby Sharp, Keith Sonnier, Wegman
-- *Video 'n' Videology: NJP, 1959-73* at Everson, cur David Ross;
        retrospective with catalog edited by Judson Rosebush
-- *Video and the Museum* at Everson, org David Ross (Rockefeller funding)

Conference with exhibitions by Campus, Downey (*Video Trans
Americas De-Briefing Pyramid* with Carmen Beuchat), Mann,

Schneider (*Manhattan is an Island*)
--Inter-Media Art Center (IMAC) estab Bayville, NY (prod & post-prod),
    dir Michael Rothbard
--Long Beach Museum of Art estab video exhibition program & collection
    cur include David Ross, Nancy Drew, Kathy Huffman; in 1976 begins
    production ctr with funds from Rockefeller
--Anthology Film Archives estab video program, dir Jonas Mekas, video cur
    include Shigeko Kubota, Bob Harris; in 1983 begins *Video Texts* org
    by Robt Haller, Bob Harris
--AIVF founded by Ed Lynch; dir Alan Jacobs, Lawrence Sapadin, begins
    publishing *The Independent*
--Anna Canepa Video Distribution estab
--The Kitchen relocates to Broome St, begins daytime exhibition program,
    first show includes tapes, installations by Bill Viola
--Electron Movers, providence RI (collective with gallery, equipment,
    workshops, visiting artists) Founded by Dennis Hlynsky, Robt
    Jungels, Laurie McDonald, Alan Powell, Ed Tannenbaum, ends 1980
--La Mamelle, SF estab by Carl Loeffler, Nancy Frank
--and/or, Seattle estab, in 1979 estab 911 video library, founded by Ann
    Focke, Robert Garner, Ken Leback, cur Norie Sato, Heather Oakson
--*New Television Workshop* at WGBH estab with Rockefeller funding, dir
    Fred Barzyk
--*Video: The New Wave*, WGBH-TV; program includes David Atwood, Beck,
    Campus, Davis, Emshwiller, Etra, Gillette, Hallock, Hays, Paik,Piene,
    Stern, VanDerBeek, Wegman; writer Brian O'Doherty
--*Cuba: The People* by Alpert, Tsuno for PBS (first documentary video using
    half-inch color to be broadcast)
--*Television Workshop*, WXXI, Rochester; dir Ron Hagell, Pat Faust, Carvin
    Eison (ends 1981)
--*Arts Magazine*, special video issue; contributions by Eric Cameron,
    Russell connor, Hermine Freed, Dan Graham, Shigeko Kubota, Bob &
    Ingrid Wiegand
--*Cybernetics of the Sacred* by Paul Ryan (NY: Anchor Press/Doubleday)
--*Independent Video, A Complete Guide to the Physics, Operation, &
    Application of the New Television for the Student, Artist, & for
    Community TV* by Ken Marsh (SF: Straight Arrow Books)
--*Prime Time Survey* by TVTV

1975
--*The Eternal Frame* by T R Utnco & Ant Farm; LBMA installation 1976

--*1975 Whitney Biennial*, work by 18 video artists
--*Projected Video* at Whitney

-- *Video Art* at Institute of Contemporary Art, U Penn, Philadelphia, cur
     Suzanne Delehanty; travels (catalog?)
--*Media Burn* by Art Farm, Cow Palace
--*Walk Series* by Peter D'Agostino at newly founded 80 Langton Street
--Real Art Ways, Hartford established; dir David Donihue, Gary Hogan,
     Ruth Miller
-- *Video and Television Review (VTR)* at WNET; exec prod Carol Brandenburg

1976
--*Commissioned Video Works* at University Art Museum, Berkeley, org by
     Jim Melchert, artists commissioned to make tapes under 4 minutes:
     Eleanor Antin, David Askevold, Siah Armanjani, Baldessari, Robt
     Cumming, John Fernie, Hilla Futterman, Leonard Hunter, Anda Korsts,
     Les Levine, Paul McCarthy, Goerge Miller, Dennis Oppenheim, Robt
     Watts Wegman
--*New Work in Abstract Video Imagery*, Everson, dur Richard Simmons,
     works by 40 artists using lasers, synthesizers, computers
--Boston Film/Video Foundation begins, founded by Jon Rubin & Susan Woll,
     dir Michelle Schofield, Tom Wylie
--Video Data Bank at SAID begins; dir Lyn Blumenthal, Kate Horsfield
--Asian Cine-Vision, NY; produces for Chinese Cable TV, media archive;
     in 1982 begins *Asian-American International Video Festival*, dir
     Peter Chow
--Donnell Library Center, NY Public Library estab collection of tapes,
     founded by William Sloan; librarians include Mary Feldstein,
     Michael Miller, Michael Gitlin, Lishin Yu
--Franklin Furnace, NY estab, dir Martha Wilson
--*New American Filmmaker Series* estab at Whitney, dir John Hanhardt
--*Independent Film & Video Preview Network* at Pittsburgh Filmmakers,
     founded by Sally Dixon & Robt Haller
--Bay Area Video Coalition founded thru Rockefeller Foundation; dir Gail
     Waldron, Morrie Warshawski
-- *Video Art* on LA Theta Cable, LB Cablevision, Santa Barbara Cabel TV,
     produced by Some Serious Business & LBMA, ends 1979.
--*Cable Soho*, NY, produced by Jaime Davidovich, becomes Artists' TV
     Network in 1977
--*Image Union*, independent prod company forms to offer alternative
     coverage of Dem Convention & Election Night; produced *The Five
     Day Bicycle Race*, *Mock Turtle Soup* with live call ins
-- *Video Art: An ANthology* (NY: Harcourt Brace Jovanovich), editors
     Beryl Korot & Ira Schneider

-- *Video: State of the Art* by Joanna Gill (NY: Rockefeller Foundation)

1977

--Image Film/Video Center, Atlanta estab; begins *Atlanta Independent Film & Video Festival*, dir Gayla Jamison, Anna Marie Piersimoni, Marsha Rifkin

--SWAMP, Houston (originally associated with Rice Media Center); conducts *Texpo Film & Video Festival*, produces local PBS series *The Territory* dir Ed Jugetz, Tom Sims

--Locus Communications, NY, equipment access, dir Gerry Pallor

--Port Washington Library visiting artists series, dir Lillian Katz

--Steina & Woody Vasulka & Jeffrey Schier begin work on Digital Image Articulator in Buffalo

--ZGRASS, personal computer graphics system designed by Tom DeFanti, Chicago

--*Satellite Arts Project*, LA, by Kit Galloway & Sherrie Rabinowitz; live interactive broadcast between CA, MD, WDC

--*Documenta VI*, Kassel, cur Wulf Herzogenrath; satellite perf with Beuys, Davis, Paik presented thru WNET

--*Send/Receive Satellite Network* coordinated by Liza Bear & Keith Sonnier; support from Public Interest Satellite Asso (PISA) and NASA (2-way transmission betw NY, SF; including Margaret Fisher, Terry Fox, Brad Gibbs, Sharon Grace, Carl Loeffler, Richard Lowenberg, Alan Scarritt, Bear, Richard Landry, Nancy Lewis, Richard Peck, Betsy Sussler, W. Sharp, Paul Shavelson, Duff Schweiniger, Sonnier

--*The New Television: A Public/Privcate Art* (Cambridge, MIT Press) Manifesto with essays from Open Circuits Conf at MOMA in 1974