

NEW ADDRESS

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617 495-8197

August 31, 1998

The Vasulkas  
Route 6, Box 100  
Santa Fe, NM 87501

Junk in the New York Times and farts in the White House  
- unimaginable for the Violas and Hills of the second  
generation!

I send photographs of how Media Study/Buffalo once looked  
and of the empty space on Deleawre Avenue. In contrast,  
the Warner Building on Franklin Street is thriving,  
housing three bars, one on the roof, and a new radio  
station.

I attach, on two sheets, video materials still in Buffalo.  
One is a box of 3/4 cassettes of my Film-Makers interviews  
for Channel 17. I have contacted 17 to see if they still  
have 2-inch or 1-inch copies or possibly, digital. I'll  
let you know. The second is a box of open-reel 1/2 inch  
videotapes of interviews with filmmakers. Steina wanted  
to know the tape formats, and John Minkowsky has forwarded  
that information to you. Should I eventually send these  
to you or to Anthology Film Archives?

Best wishes,

  
Gerald Grady

Mr. Steve Seid  
Video Curator  
Pacific Film Archives  
Berkeley Art Museum  
University of California  
2625 Durant Avenue #2250  
Berkeley, CA 94720-2250

Ms. Maria Troy  
Associate Curator  
Media Arts  
Wexner Center for the Arts  
The Ohio State University  
1871 North High Street  
Columbus, Ohio 43210-1393

I enclose a copy of Joanne Kelly, "The National Center for Experiments in Television KQED" in National Film Festival (catalogue) - October 22-23, 1983, presented by American Film Institute at the John F. Kennedy Center for the Performing Arts, Washington, D.C., pp. 58059. This is part of the exhibition record of these tapes. The only hard copy of the catalogue, which I have been able to locate, is at Barbara London/Myra Green/ Video/ Museum of Modern Art/ 11 West 53rd Street/ New York, NY 10019.

Perhaps the first person to write about the Center was Gene Youngblood, Expanded Cinema (New York: E.P. Dutton & Co., 1970), pp. 282-316 - "Synaesthetic Videotapes." Two theses, both unpublished, were done on Brice Howard, and I shall forward specifics at a later date.

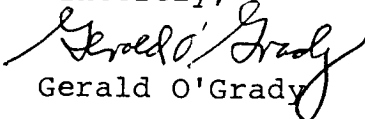
You may reach David Dow at 1225 Laurel Lane/Richardson, TX 75080/ tel. 972 238-0269. A very important sound artist who worked with him was Jerry Hunt (now dead), but his materials were in the hands of Stephen Housewright/Rt. 1/ Box 240/ Canton, TX 75103/ tel. 903 848-4324 or Director. Humanities and Literature/ Dallas Public Library/ 1515 Young Street, Dallas, TX 75201. The collection is now in the hands of Rod Stasick/10955 Sinclair/ Dallas, TX 75218/ tel. 214 327-5962.

A person who played a role, under the late Bill Jones, in preserving the tapes is Don Pasquale, who is at 214 352-6514, and will leave Texas soon; you should also contact Bart Weiss/ Dallas Video Festival/ 1405 Woodlawn Avenue/ Dallas, TX 75208 - he has information about 2-inch playback equipment, etc. tel. 214-948-7300. He can put you in touch with Walid Kalid, who also played a role in preserving the tapes.

I am wondering if you have any information on a David Ahlstrom, who once taught music at Mills College, and now lives on the West Coast, I am told.

Also, a suggestion: find from the Rockefeller Foundation if Howard Klein is alive and interview him about all of these people. Paul Kaufman, who succeeded Brice Howard, came to Harvard for a year and then was at Stanford, but my trail on him breaks down. Do you have information on his current whereabouts?

Sincerely,

  
Gerald O'Grady

cc: John Minkowsky/ The Vasulkas  
copy: Joanne Kelly essay



National  
Video Festival

ed by American Film Institute  
ed by Corporation of America

# Nat'l Video Fes

September 22-25, 1983

The American Film Institute Campus  
Los Angeles, California

October 22-23, 1983

John F. Kennedy Center for the Performing Arts  
Washington, D.C.

**National Video Festival**

Presented by The American Film Institute  
Sponsored by Sony Corporation of America

## Introductions

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- 6 **Jean Firstenberg** Director, The American Film Institute
- 7 **J. Phillip Stack** President, Sony Communications Company
- 8 **James Hindman** Festival Director
- 10 **Keynote Speaker: Elton Rule**  
Vice Chairman, American Broadcasting Companies, Inc.

## In Person/Presentations

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- 12 **Jacqueline Kain** Introduction

### M u s i c

- 14 **Max Almy** Perfect Leader
- 15 **Robert Ashley** Perfect Lives
- 16 **Dara Birnbaum** The Damnation of Faust: Evocation
- 17 **Falso Movimento** Tango Glaciale
- 18 **Branda Miller** LA Nickel
- 19 **Meredith Monk** Turtle Dreams (Waitz)
- 20 **Bill Viola** Anthem

### N o r r a t i v e

- 21 **Phylis Geller, Arthur Kopit, John Madden** Wings
- 22 **Jean-Luc Godard** Scenario du Film Passion
- 23 **Andrew Gosling** Jane
- 24 **Laura Mulvey and Peter Wollen** The Bad Sister
- 25 **Robert Wilson** Stations

### D o c u m e n t a r y

- 26 **Elizabeth Daley, Constance Kaplan, Victoria Hochberg** Tell Them I'm a Mermaid
- 27 **Robert Drew** Being with John F. Kennedy, Marshall High Fights Back and Fire Season
- 28 **Robert Estrin** Boots of Spanish Leather
- 29 **Michael Marton** Watch Me Now
- 30 **Michelle Parkerson** Gotta Make this Journey
- 31 **Skip Sweeney** My Father Sold Studebakers
- 32 **Edin Velez** Oblique Strategist

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**Panels**


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- 34 **Interactive Videodisc: Creative Design**  
*"On Interactive Video Narrative" by Virgil Grillo, moderator*
- 37 **Interactive Videodisc: Research, Development and the Future**  
*"The Difficult Birth of a New Art" by Sheldon Renan, moderator*
- 39 **Breakout Programs: Changing Broadcast Forms**  
*Ron Powers, moderator*
- 43 **Music Video: Developing the Craft**  
*Jo Bergman, moderator*

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**Installation**


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- 48 **Mary Lucier Ohio at Giverny**

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**Screenings**


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- 51 **National Video Festival Student Competition**  
*1983 National & Regional Winners*
- 
- 55 **A Tribute to Ernie Kovacs: Video Artist**  
*Curated by Robert Rosen*
- Public Television Laboratories**
- 58 **The National Center for Experiments in Television/KQED**  
*Curated by Joanne Kelly*
- 60 **The TV Lab/WNET/Thirteen**  
*Curated by Carol Brandenburg*
- 64 **New Television Workshop/WGBH**  
*Curated by Susan Dowling*
- 67 **Approaching the Preservation of Independent Video**  
*Curated by Robert Harris*
- 70 **A History of Television Commercials**  
*Curated by Robert R. Littman*
- 72 **Computer Graphics and Animation**  
*Curated by Louise R. Etra*
- 75 **The Art of Information: Update on Institutional Television**  
*Curated by Jessica Fish and John Rice*

- 
- 78 **For Peter Ivers (1946-1983)**  
*A Tribute from His Friends*

# The National Center for Experiments in Television KQED

The current interest in pioneering video artists and the media centers that support them is an indication of just how far video has come as an art form. There is now a history to refer back to—a lost history to rediscover.

The San Francisco Bay Area played a prominent role in developing television as an art form in the late 1960s and early 1970s. The video "scene" flourished here, especially through the work of groups like the National Center for Experiments in Television, Video Free America, Optic Nerve, Ant Farm, TVTV, and the De Saisset Gallery. This compilation is a profile of one of the most important early video centers, the National Center for Experiments in Television. Like the TV Lab at New York's WNET-TV and the New Television Workshop at Boston's WGBH-TV, the NCET was one of a handful of media centers affiliated with a public television station.

From 1967 to 1974 the National Center for Experiments in Television at KQED supported significant research and development for the field. Over its seven year lifespan it received \$600,000 from the Rockefeller Foundation, substantial funds from the Corporation for Public Broadcasting, as well as the various benefits of an affiliation with a public television station in a major market. From this secure organizational base, NCET fulfilled its mandate of unrestricted video experimentation.

In its first year, under the direction of Brice Howard, NCET stressed a collaborative, interdisciplinary approach with a poet, a filmmaker, a novelist, a painter-sculptor, and a composer working with a television director from KQED. One of the most interesting programs from this period was Joanne Kyger and Bob Zagone's *Descartes*. Other collaborations with prominent artists, such as theater director Tom O'Horgan of "Hair" fame, occurred as well, yielding innovative programs like *Haimskringla*. At this time, KQED itself was a hotbed of radical programming.

In its second phase, the National Center moved out of KQED into its own loft space. The makers were not involved in collaborative projects as before. Instead, NCET evolved into a small group of individual videomakers, each with his own interdisciplinary background, each exploring new ways of thinking. It was at this time that Stephen Beck built his direct video synthesizer. Although several programs were aired on KQED during this period, including the Emmy award winning *Lostine* by Willard Rosenquist and Bill Roarty, there was never the pressure of producing for a broadcast date. Experimentation was viewed as an informative end in its own right; process triumphed over product.

Center artists revolutionized the environment that video was viewed in. In a time when video projectors were not in common use, Don Hallock's large kaleidoscopic *Videola*, essentially an environmental sculpture using conventional TV

Curated by  
Joanne Kelly

images and mirrors, presented new possibilities for viewing untraditional television. Center artists also went on to challenge the sense of time that television inherited from film—in particular, in the work of Bill Gwin, which, according to the artist, would ideally be presented "in a loop, running continuously. There would be no beginning, no middle, no end, and no particular duration . . . in much the same way a person spends time with a painting . . ."

In the third and last phase of the Center, video art education at the University level was a prominent concern. The Center moved to Berkeley, establishing a video art workshop through University of California faculty member Willard Rosenquist. Other satellite centers at Rhode Island School of Design, Southern Methodist University, and Southern Illinois University at Edwardsville each contributed to this educational thrust.

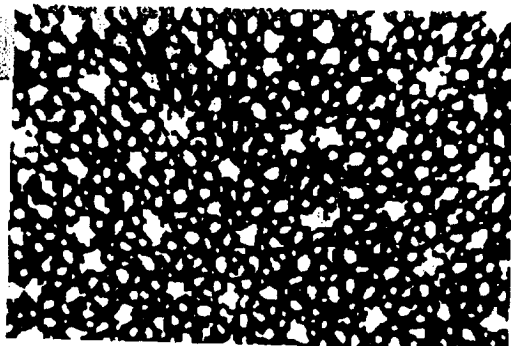
In 1974, the Center as a place for aesthetic exploration began to dissolve and, by 1975, individual video artists were working on their own without the Center's



a new pos-  
al television.  
challenge  
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work of Bill  
artist, would  
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way a per-  
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Electronic Notebooks

organizational support. In an interview with Johanna Gill, Bill Gwin spoke fondly of the past: "It [the Center] was lucky for me because I learned how to use things in a very slow and unpressured way . . . It was nice. There's no place like it anymore, which is a problem."

Indeed it is a problem. Today's non-profit media centers have jumped into the marketplace, hungry for commercial revenues from the use of their video artist's facilities. This current policy pits artists against industrial and commercial makers within the walls of alternative television centers. It is a far cry from the secure haven that the Center had provided for artists, as they built an award-winning body of synthesized/processeed video art works. The Center is a reminder that original, innovative work needs freedom to grow and develop. "Process over product" as a philosophy certainly can be abused, but the visionary commitment the Center had for fostering unrestricted experimentation may be its most powerful legacy.

Joanne Kelly, 1983

**Joanne Kelly** began working at Video Free America in 1973, where she became co-director with Skip Sweeney in 1978. She has curated the VFA's exhibition program for five years and has shown her own videotapes in galleries and museums across the country. Most recently, her programs have been broadcast on KOED-TV.

Excerpts from the following tapes will be presented:

**Descartes** by Joanne Kyger and Bob Zagone. 15:00, b/w, 1968.

**Video Weavings** by Stephen Beck. 8:30, color, 1974.

**Lostine** by Willard Rosenquist and Bill Roarty. 30:00, color, 1979.

**Passages . . . A Life Drawing** by Bill Roarty. 30:00, color, 1973.

**Irving Bridge** by Bill Gwin. 30:00, color, 1973.

**Electronic Notebooks** with Brice Howard and Center Artists. 30:00, color, 1975.

**Ecotopia** by Earnest Callenbach with Stephen Beck. 5:00, color, 1975.



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Mr. Steve Seid  
Video Curator  
Pacific Film Archives  
Berkeley Art Museum  
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2625 Durant Avenue #2250  
Berkeley, CA 94720-2250

Ms. Maria Troy  
Associate Curator  
Media Arts  
Wexner Center for the Arts  
The Ohio State University  
1871 North High Street  
Columbus, OH 43210-1393

My sole address is 12 Inman Street, Apt. 31/Cambridge, MA 02139-2418/ tel. 617 441-6944/ fax: G.O'Grady/c/o Harvard Film Archive 617 495-8917. I am now retired from both the State University of New York at Buffalo and from Harvard University.

With your covering letter of June 21, 1998, I have now received your proposal of October 21, 1997 which the Pacific Film Archive made to The Rockefeller Foundation.

The materials from The National Center for Experiments in Television which were at Media Study/Buffalo were all on 3/4 inch format and were transferred at NCET by Bill Gwin and Steina Vasulka. Lists of the holdings were published by John Minkowsky, "The Videotape Collection at Media Study/ Buffalo: A Report," Afterimage 5,8 (February, 1978), 4-5, reprinted in Media Study/ Buffalo (March, 1979), 8-9.

The tapes have been carefully preserved. At the end of July, they will be taken out of storage and shipped to The Vasulkas (Steina and Woody)/ Route 6, Box 100/ Santa Fe, NM 87501/ tel. 505 424-8786. The Vasulkas, who were themselves Artists-in-Residence at KQED during that period and who assisted in establishing the Media Study/ Buffalo collection, will return from Japan, Korea and Iceland in mid-August, 1998. At that point, you should contact them about your project.

You need to clearly understand, as I have told all concerned in conversations, that Media Study/ Buffalo held these tapes on the condition that they not be copied, distributed or exhibited.

Since you mention your hope to exhibit some of the original equipment used to make these tapes, my suggestion is that you consult The Vasulkas for their exhibit at Graz, Austria and the catalogue, Eigenwelt Der Apparate-Welt (Pioneers of Electronic Art).

I note that your proposal does not mention Robert Jungels who founded "The Electron Movers" at the Rhode Island School of Design. He visited NCET for a month each summer, his students interned there, he hosted Brice Howard at his own school, and he has tapes which they produced as well as tapes sent to him from Brice Howard. His home is 349 Hope Street, Providence, RI 02906/ tel. 401 831-1643/ fax 401 455-0581/ e-mail [bjungels @ ultranet.com](mailto:bjungels@ultranet.com).

I also note that you do not mention David Dowe who taught

at Southern Methodist University and brought the NCET tapes there. I shall send you information about him at a later date.

To my knowledge, there is not a great deal of bibliography, and I do not have my books and papers here in Cambridge at the moment. However, JoAnn Kelly of Video Free America wrote an essay which the American Film Institute printed after one of its conferences. You might contact her, or I shall track it down for you soon. The first time that a selection of tapes of this kind were shown in Europe was in a show which I curated for Experimental 5, International Experimental Video Exhibit, December 26-January 5, 1974, Knokke-Heist, Belgium. Media Study/Buffalo produced a catalogue, with program notes by Seth Feldman, and cover designed by Woody Vasulka. Arrangements were made with each individual artist to show tapes by Beck, Gwin, Hallock, Roarty and Zagone from NCET and many others. The tapes were also discussed at Open Circuits: The Future of Television: An International Study Conference at The Museum of Modern Art, New York, January 23-25, 1974. Co-Directors: Gerald O'Grady, Fred Barzyk, Douglas Davis, Willard Van Dyke. The papers were published by Douglas Davis and Allison Simmons, ed., The New Television: A Public/Private Art (M.I.T. Press, Cambridge, MA., 1977) and included an essay on The Rockefeller Foundation's funding of the three national centers in San Francisco, Boston and New York.

Finally I should add that John Minkowsky should be contacted for written and printed materials. You should also know that in 1978, Minkowsky had a Video Research/Travel Grant from the National Endowment for the Arts, on which he visited most of the production and exhibition centers in the country (see Media Study/Buffalo (January-May, 1979). p. 29. He met Brice Howard in Dallas and interviewed him on audiotape. His address is 200 Niagara Street, Apt. 604/ Buffalo, NY 14201/ tel. 716 855-3971. Brice Howard, Paul Kauffman, and almost all of the NCET artists visited Buffalo at one time or another when he was Video/Electronic Arts Curator. He has a knowledge of the NCET work in the context of all the other work being done at that time.

Sincerely,

*Gerald O'Grady*  
Gerald O'Grady

cc: John Minkowsky  
Steina and Woody Vasulka

copy of Experimental 5 catalogue mailed to Ms. Maria Troy.

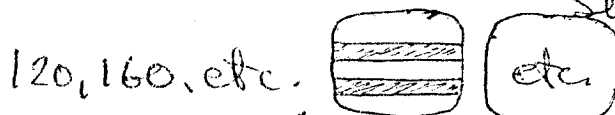
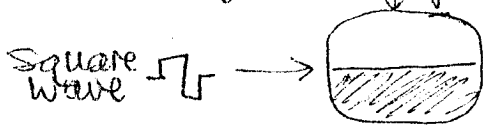
VASULKAS / 10-2-73

interfaces in boxes - exchange input for something else  
modulate one freq. pattern to another (sd. to life, btw  
to color, etc.)

on video artist level, everything's primitive - ~~natural~~ <sup>inevitable</sup>  
~~have~~ inevitable agonies of hook-ups, etc.

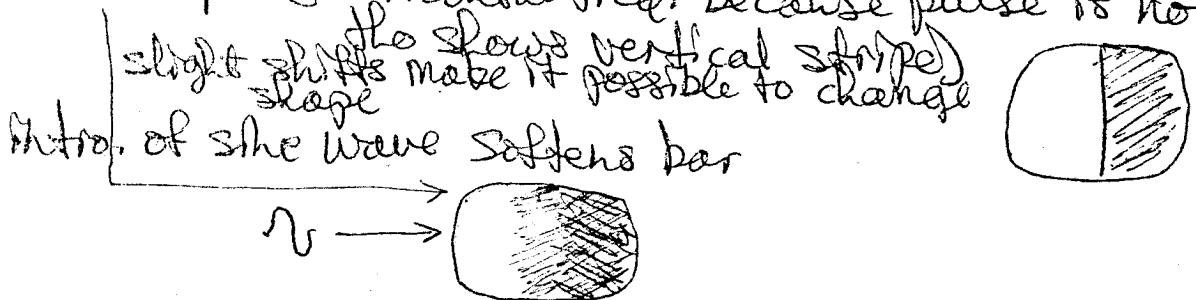
oscillator plugged directly into monitor - pre-amp'd into 'line in'

important freq.'s: 60 cps (sd. that permeates America,  
as 50 cps permeates Europe -  
ours is 1st generation to  
experience it -  
Slows you down - tranquilizer)



15,750 cps (horizontal freq. because pulse is horiz.,  
slight shifts <sup>the slows vertical stripe</sup> make it possible to change  
slope)

Intro. of sine wave softens bar



much higher - 3.5 megacycles to red-purple, freq.  
becomes color  
make pure colors of red-green-blue

by mixing low + hi freq. input, get Am. flag image,  
etc. - red + blue stripes or whatever

video synthesizer mixes multiple freq.'s

fluid patterns gained by introducing video feedback.

color in video totally the reverse of film -  
in film, cam. & prof. & screen stay same, change stock  
to go from b/w to color.  
in video, stock (tape) stays same, change everything  
else - cam., deck, monitor.

## Feedback

may take hours to set up.

slow down pulse by going out of focus

other variables: light source (eg. one small bulb),  
F-stop, zoom, focus, brightness & contrast (mon.),  
cam. position

direction of pulse controlled by cam. position: relation  
of cam. direction to center axis of screen.

circular or spiral motion controlled by angle of cam.  
to mon.

can introduce real image, e.g. hand in front of screen

then intro. keying - makes windmills

then turn off light

can use mirror or mirrors

Skip Sweeney, Tomas' Favorite - tape of feedback (prob.  
with mirrors) - slow snaky geometric Minoan designs.  
nice image (bad sd) = beautiful

Stephen Beck, Concepts - synthesized & real imagery

will later discuss dif. kind of synthesizer without oscillators -  
works by manipulating scanning

all designs controlled precisely by timing - microseconds  
& nanasec's

SUM. so far: 2 pure image sources -

1. oscillators
2. feedback

NEXT. processing of image.

→ keyer - high energy switching  
to arrange hierarchy of images. must control  
light levels.

accentuates b's + w's - eliminates grays.

keying  
over itself

image keyed by itself - brightest lit areas are  
switched to black.

other mode - (white key) - darkest areas switched  
to black.

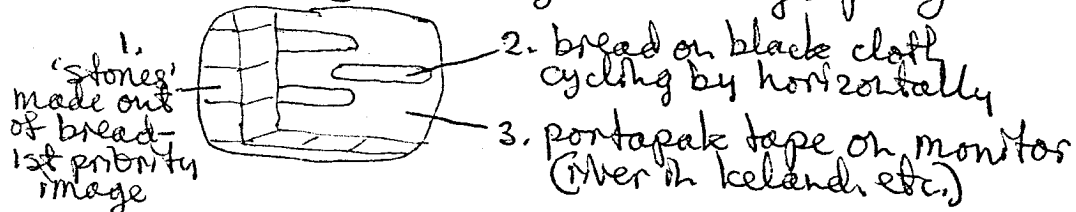
then's can insert other image into the black.

Vasulka's have a 6-step keyer - mix 6 cam's.  
no other exists, not manufactured.

chroma-key switches on basis of color instead of  
btw. levels.

Emsh's Seapemates uses layering by chroma-key.  
(rarely used except for commercial inserts)

Vasulka's Golden Voyage - Magritte image play -



Vasulka's call it 'collage' - some objections - cd. call  
it layering.

technology becomes philosophy / e.g. feedback creates a  
- whole philos. of approach.

video used to be largely accidental - but now is  
largely created, & now precisely controlled.  
images now precisely controlled.  
the 'mistakes' can still create new techniques.

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SD. - IMAGE Interface.

Vasulka's Evolution - image controlled by <sup>feedback</sup> voltages -  
then plugged into sd. so image freq.'s control sd.  
so for most of Vasulka's work has been exploratory -  
very little composition.

~~plugged~~

electromagnetic deflection of raster - e.g. Park

→ plugging image into sd. - or 8-pin plug, ea. pin  
has precise function. Look up in manual  
as to which 2 are video. then alligator clips  
connect wires into microphone input.

VASULKA'S / 10-4-73

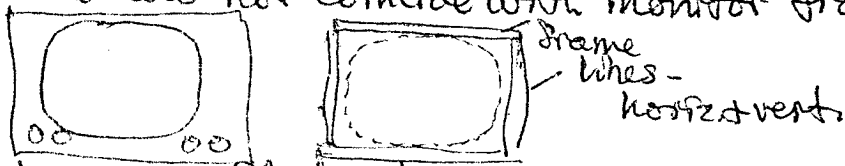
coming wks. - color / processing / sd.

BNU scan-manipulation synthesizer

### FRAME.

precisely controlled image frame.

series of frames - ~~30 fps~~ (30 frames per sec., but 60 fields per sec.)  
Signal frame does not coincide with monitor frame.



Eur. TV has more flicker, because 50 f/s./sec.

Video better for slow motion - breaks down into 60 phases, rather than 24 - greater analysis of kinetic parts.

Video carries less info. than film, but more kinetic phases.

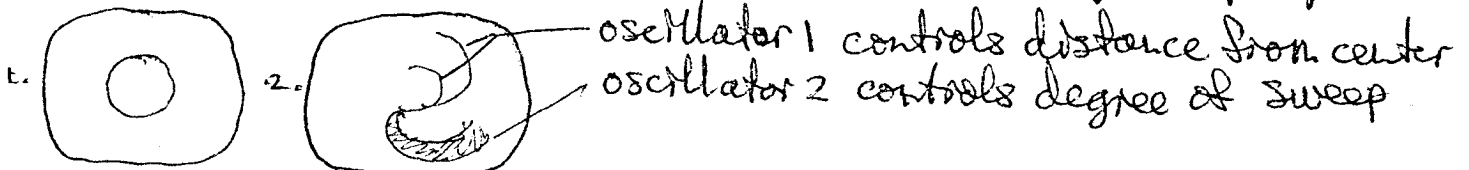
Special Vasulka interest: frame displacement - horiz. or vert., many tapes with objects simply moving by (eg. bread) - usually with multiple monitors.

With computer, can calculate every point of the image, without computer capability, variety of techniques developed to bend + change image -

Nam June used anarchic approach to distort + destroy image - even he is now buying a mini-computer to control techniques

Ron Hayes, as well as Nam June, - <sup>use</sup> deflection manipulation Dolphin Productions (commercial group) (Electric Co. commercials, etc. - make lots of money)

- tape 1. Scan converter - ~~tape~~ - with decay mode  
2. deflection manipulation - via x-y oscilloscope display tube



Scan converter - makes sd. freq. into image

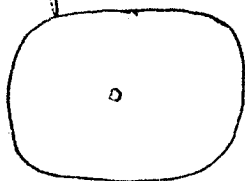
- 1. write-in
- 2. read-out
- 3. decay
- 4. erase
- 5. repeat
- 6. store (some s.c.'s have memory)

s.c. modes

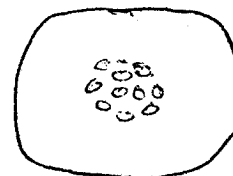
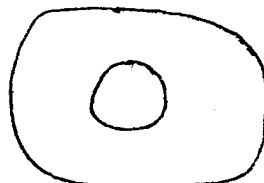
can borrow one from Technicon's  
input from Bulka sd. synthesizer.

- 1. scan converter <sup>is a box that</sup> mediates between sd. source <sup>freq.</sup> & tape deck
- 2. but x-y oscillator image requires camera to take image off screen

1. sd. input - s.c.



writing circle  
by increasing  
volume -  
makes circle  
bigger

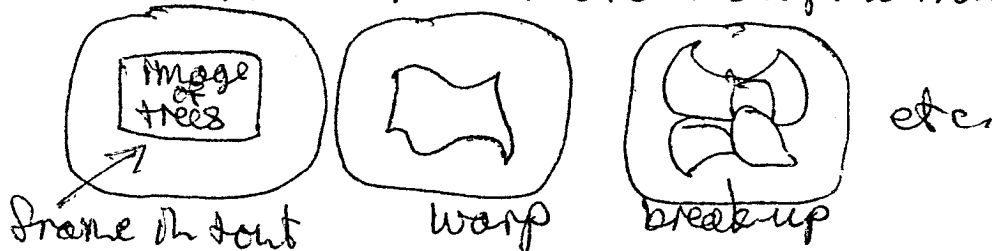


then  
decay

KNOBS & SLIDES.

Knobs give almost no precise control, slides a little makes it medium anarchic - can only try to develop functional formulae

DOLPHIN PROD. TAPES - raster manipulation (all via electromagnetic freq. manipulation)



Scan converter <sup>Dolphin Prod's is</sup> more sophisticated - analog computer  
e.g. 2 oscillators - 1 controls horiz. roll, 1 vertical

analog computer - controls general shape of image,  
not digital control of each bit



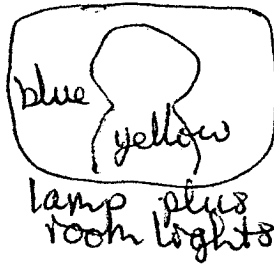
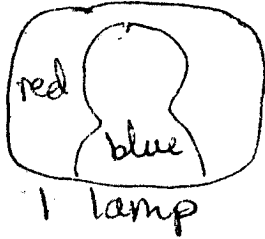
## COLOR.

color synthesizer assigns colors to different gray scales.  
nearly all video artists use b+w cam's

color cam. whole dif. game - can record red, green + blue  
separately + recombine, etc.

chroma-key, color bkgd. generator - for use with color cam.  
industrial colorizers exist.

vs. ETE Sigal colorizer - for aesthetic purposes.



1st - can change colors by  
adding more light -  
since color depends on  
light levels.

2 parallel sets of info. - for tape.  
b + w.  
chroma.

Sigal synthesizer controls:  
white level - washes out  
black level - mutes colors, makes pastels  
color level - burns out colors  
etc.

simplest kind of synthesizer - known for 7-8 yrs. by  
industry. but used only for titles + bkgds.

George Brown, ETE, Luv. devised their own - Sigal had  
1st - came into its own with video movement.

with Sigal, cannot control one color without changing  
all others.

newer synthesizer, more sophisticated - can control  
slice image into 9 or 16 islands + control  
color separately in each. / can actually  
distinguish 32 steps at present.

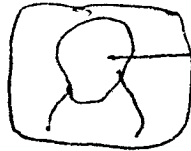
can also affect colorizer via processing image -  
e.g. keep simpler info. in image before color.

## FUTURE

color diode screen wd. eliminate phases + frames per sec.  
wd. eliminate scanning left to right + top to bottom  
(wd. screen feel diff. If scanned in spiral? or  
vertically - (our eye perceives vertical more sensitively?)

## BACK TO COLOR -

Stein's new synthesizer has some drawbacks as well -  
this synth. follows shapes



e.g. isolates face  
in fluid form

new synth. breaks up image  
into 16 parts



e.g. isolates one  
eyebrow from  
other -  
fragments

Woody:

We rebuilt the Sigal into 2 parallel colorizers - ... ?  
(modify internal + external signal ... ?)

new synthesizer has 9 levels + 3 knobs for each  
(red, green + blue)

this synth. ... ?

Stein's can adapt pontapak  
RF unit for color deck  
to home TV (color, not  
monitor) ... ?

## SWITCHER.

we had built for us a fast switcher - to switch between  
2 images as fast as you want - for flashing effect.

Robt. Zagone from KQED - Ace of Cups tape - color cam. synth.

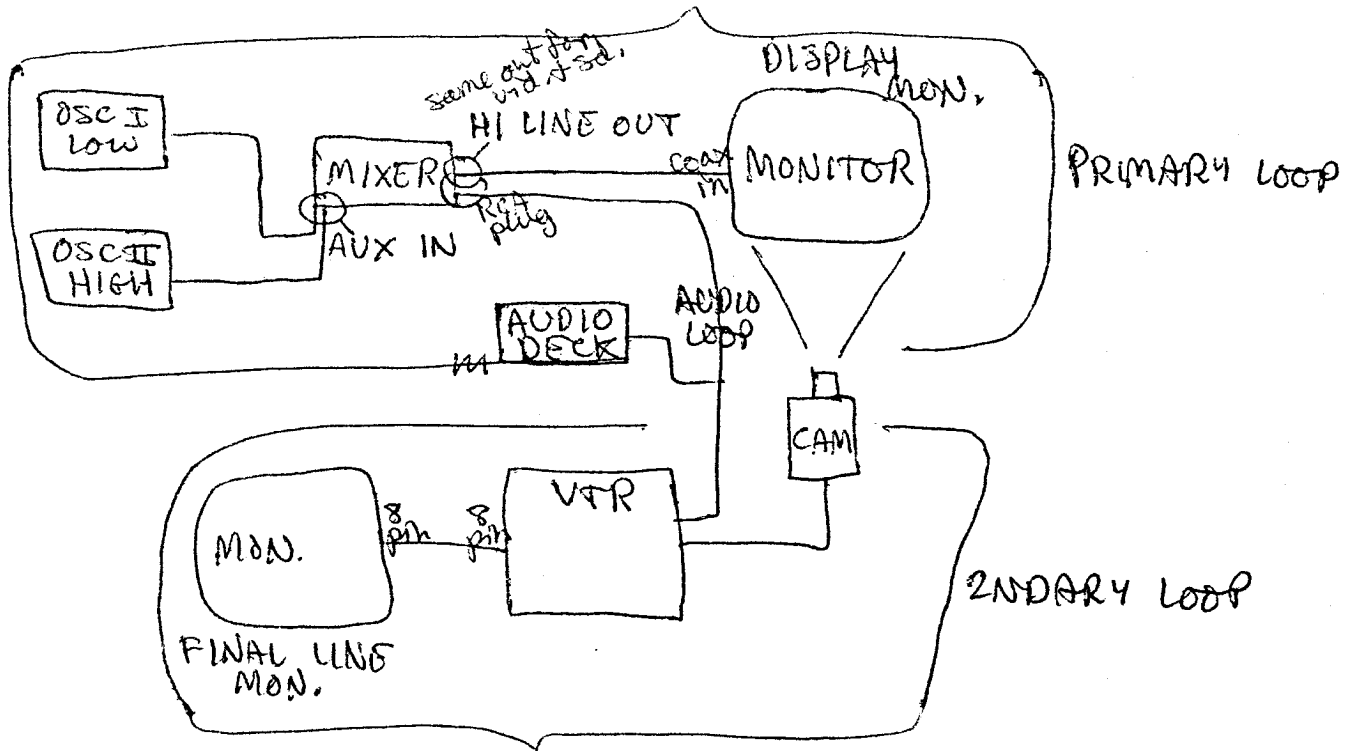
Zagone went into his own film prod.

KQED went into Experimental Video Ctr. under Bruce Howard

East Coast video <sup>sometimes</sup> flashy. West Coast video very disciplined

VISULKA'S - / 10-9-73

2-6<sup>30</sup> every day



osc. signal makes interference pattern, can't be recorded without going thru mon. + cam.

Mixer is not SEG, just mixes 2 signals.

Cam.-Mon. interface creates flickers since scanning on mon. is not in sync with scan. of cam. - looks like visual heartbeat, pulses in + out of phase, light-dark-light-dark.

freq. control { 120 khz. - 420 mhz. / hi osc. (kilohertz, megahertz)  
 higher you go, the finer the structure.  
 lo osc. controls number of vertical bars in pattern.

volume control { vol. on osc. - increase causes higher contrast  
 vol. on mixer - picture or no picture.

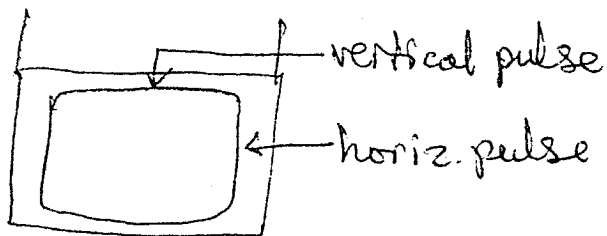
PROBLEMS.

1. control speed of change
2. make patterns

variables.

1. wave form - sin or square
2. relationship between 2 osc.'s

Sync generators - absolute control relative to image -  
 2 steps more precision - ~~now~~ nano sec.'s -  
 controls horiz. & vert. frame for image.



(names reversed because refers to scope)

If you record straight from the osc.'s (without cam-mon.)  
 then playback image may will not be same as display  
 image - In fact will be different every time you play  
 it back - even more distant from original image if  
 played on another deck.  
 runs like film without sprocket holes.

### HIST. OF IMAGE/IN LIGHT OF ELECTRONIC IMAGE.

Escher - feedback  
 Magritte - keying

tape - Stephen Beck.

diamond shape generated by osc.'s  
 modulated by ext. freq.

same image ~~flipped~~ flipped - 'alternate field display' - creates  
 flashing image. (every other 1/60th sec. missing).



VASULKAS. / 10-11-73

Keyer

can only control 'front' image - 'backgd.' image stays static.

can use front image as insert or top of bkgd., or as hole thru which to see bkgd.

use matrix to replug - change front to bk. image + vice versa.

(cascading key - hook up keyers in series, two or more simple keyers.)

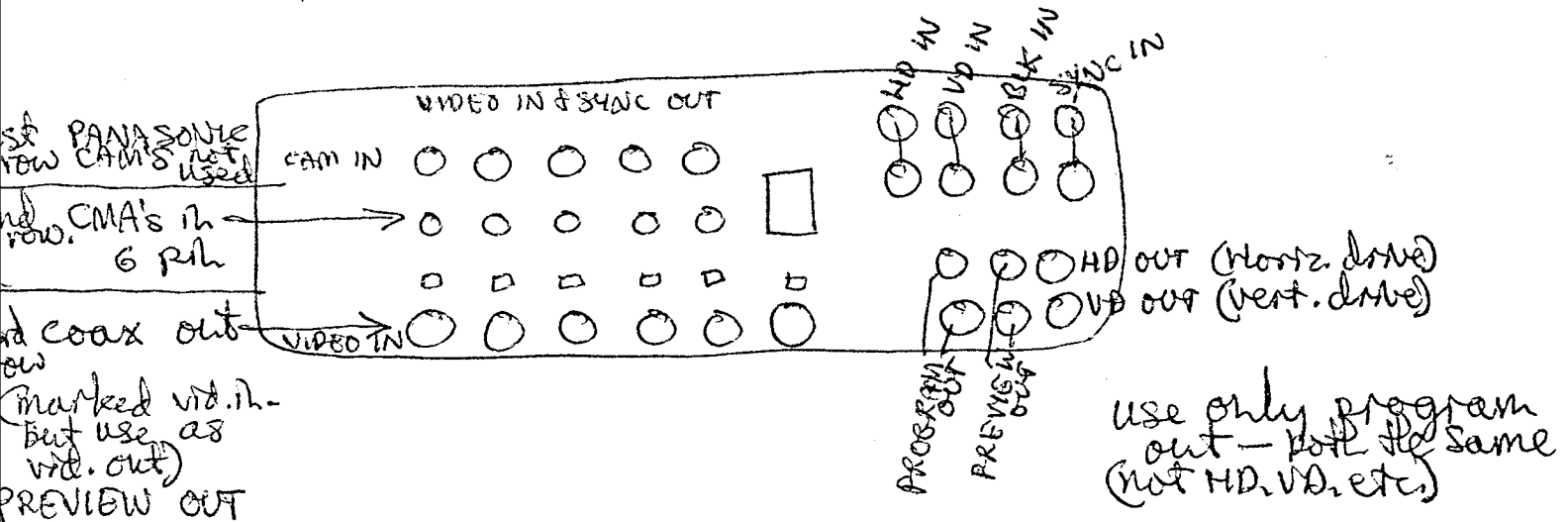
(stop Sweeney's mandala-type feedback work)

Matrix

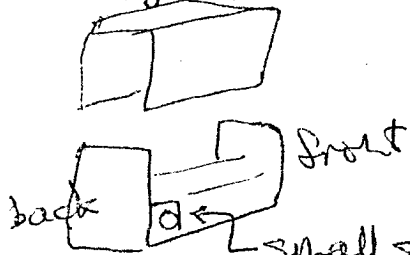
~~x~~ horiz., ~~y~~ vertical  
vertical - inputs, horiz. - outputs  
color coded inputs, numbered outputs  
10 x 10

SEG

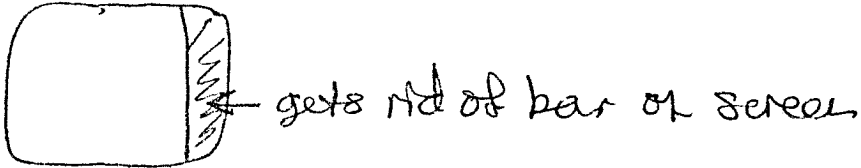
only part special effects, other part switcher



CMA adjustmt. -

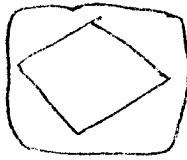


small screw driver adjust to match sync pulses.

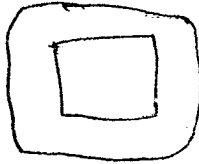


gets rid of bar on screen

also



1.



2.



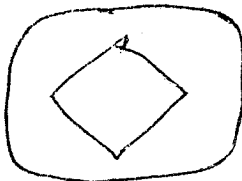
3. (mix)

needs CMA adjust. - 2 CMA's out of phase

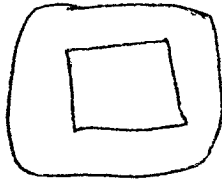
CMA generates driving pulses for camera. When 2 CMA's are mixed thru SEG, 2 sets of DMV pulses are in conflict - must be adjusted to be synchronous.

Individual monitors (1 + 2) can tolerate slight diff small differences, but mix (3) creates havoc.

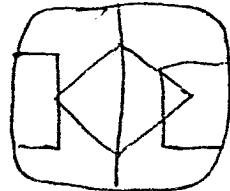
also



1.



2.



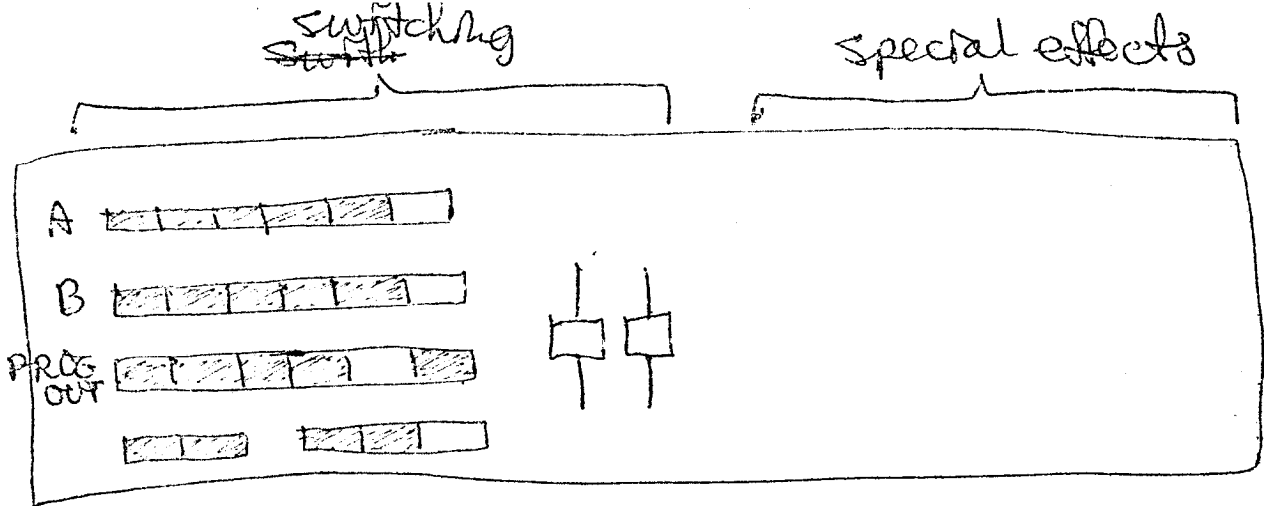
3.

line in middle - out of phase mix



should be exactly same

Can get special Vasulka effects by deliberately putting 2 cameras out of phase - can get one image travelling by in front of the other.

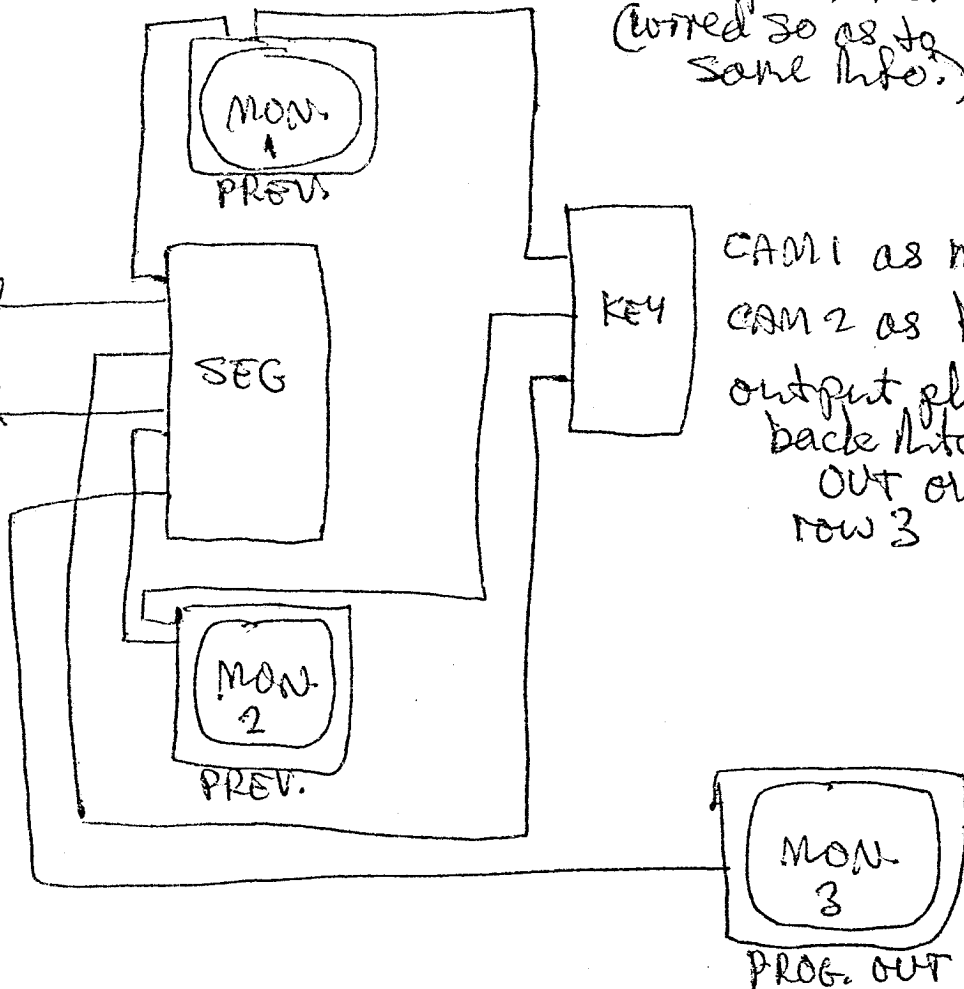
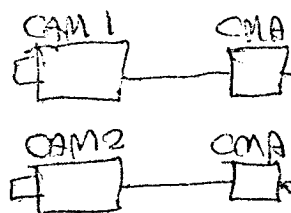


input 1 = con 1.  
 input 2 = con 2.  
 input 3 = ~~con 3.~~  
           keyer

punch 3 or prog. out for key.  
 rows A+B are not used for key.

2 EXT. IN'S - use one as input, other as out -  
(wired so as to carry same info.)

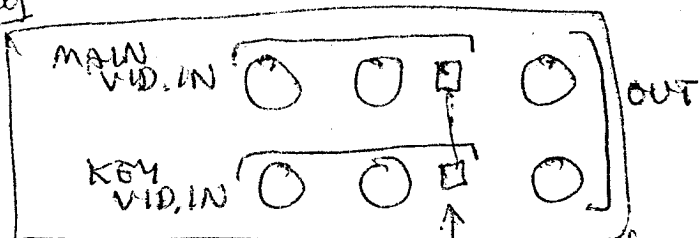
Keyer



CAM 1 as main vid. in  
CAM 2 as key in  
output plugged  
back into PREVIEW  
OUT of SEG -  
row 3

Key

main vid. is  
bbgd.  
key is  
insert/  
hole bbgd.



If signal is too high &  
overloads, can use 75Ω  
to cut down.

switches - 75 ohm / or high (open)  
termination switches, leave open (high).  
since signal goes on elsewhere.  
(same on monitors)

key off - bbgd.

key white/blk. - inversion (insert or hole)

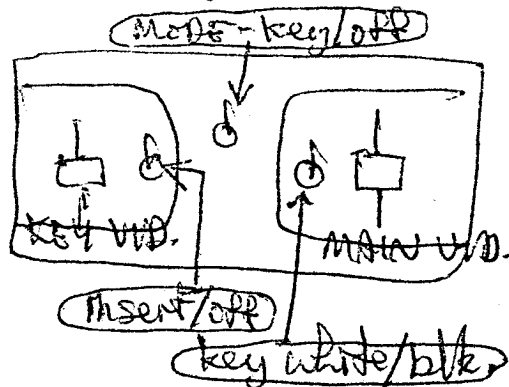
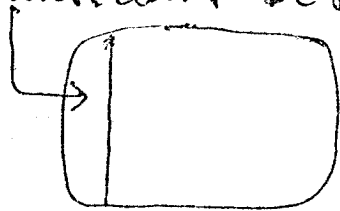
termination switches -

if system is overterminated, picture is gray  
if under terminated, gets too white & too black -  
must terminate somewhere - start with keyer.



## Keyer Functions -

black <sup>or white</sup> bar is in this keyer (unfortunately) - permanent, can't be fixed.



1. key white/black - insert or hole  
(makes blk. or wht. into hole)
2. insert off/on - ?
3. key/off - takes key image in or out

---

## oscillators

~~can be~~ can be plugged into extra inputs on keyer  
(color produced by high freq. osc. cannot be recorded - has no frame of ref. -  
can only be produced directly on monitor.)  
plug both osc.'s into key input & can make mesh  
in front of main image.

---

## CONTROLLED ROLLING -

- HD or VD (horiz. drive or vert. ds.) can be soldered into at CMA, hook up osc., say to HD
- 2 CMA's then plugged into keyer - osc. controls frame like - either horiz. or vert. - on 1 of the 2 keyed images.

BRICE HOWARDS. / 10-15-73

KQED, SF - 1st / since then - WGBH Boston +  
(artist in residence oriented) NYC  
(access oriented)

Exp. TV ctr. has campus ctrs. - So. Methodist Univ., Texas,  
etc. - So. Ill. at Edwardsville, +

has Exp. TV ctr. also publishes VideoSpace by B.H. + printed  
reports. - 'totality' of media approach.

1967 - started work in opposition to standardized TV,  
commercial/institutional hierarchy (some surveillance  
cameras, but nothing like now).

now available independently - both financially +  
personally. In terms of personal access/control.

now 2 TV's exist instead of 1.

still incredibly primitive.

2nd TV has 2 aspects: info. gathering (social  
condit.'s, activism, etc.), + arts.

by + large 2 aspects don't overlap - but  
sometimes a few people do both.

tonight's aspect of new TV rooted in trad. of art.

conventional TV is altogether derivative: out of  
trad.'s of rad. b., film, drama, <sup>journalism</sup> etc.

exp. TV attempts new video forms - keep out  
~~derivative influences~~ previous influences.  
alternate trad.'s of ptg + music come forth.

1. Wm. Rorarty (on staff of Nat'l. Ctr.), tape.

'composition is the most mature human act'  
shape - texture - motion - color ← 4 elements of comp.  
plus time (about which we know little)  
time, not the rhythmic patterning musicians know,  
but what?

Feedback - a narcissism, as long as it's a form  
of play, great - but if taken too seriously, can  
be a trap.

2. Electronic Videospace Notebook - this one about  
Feedback.

606 art is a model of conse. at any given time  
[vs. sci. - model of contents of perception -  
the world]

84 videotape as art: don't look at a bk. every  
day either.  
[videotape > image bk. - neither ptg. nor print]

606 have to have 14,000,000 <sup>viewers</sup> to stay on the air on  
current TV - makes lowest common denominator  
viewing.

vs. only 100 or less to see this videotape - + we  
can interact with image + create our own.  
we choose vs. they choose.

BH don't understand relation of video to politics + economics — (except it's enormous).

[personal autonomy vs. monolithic hierarchy]

3. Pt. Lobos State Reserve, Wm. <sup>Graham</sup> ~~Graham~~ / sd. Warner

Tepson

sea + trees as material for keying + inserts — recurrent forms

Conventional TV tends to be an aural medium — sd. exists + makes sense without images, but not images without sd.

wanted to explore video as a visual medium

4. Willard Rosenquist, Prof. of Design UC Berkeley / sd. Warner Tepson — 9 people involved in making tape.

2 color cam's + mixing console, with color lites

5. tape with male dancer. Texas group in So. Ill.

David Dow + Jerry Hunt (Texas) — (same as #2.)  
Laresk (sp.?) — part of feedback notebook.

Ino Morrison  
(John)  
J.D. Jarvis  
(So. Ill.)

~~6. Empty Bridge — The Bridge ex-  
chromatographer in tape (1968)~~

6. (notebook on design)

The Bridge exercise — Phillip Green,  
chromatographer in tape. (1968)

VASULKA'S / 10-16-73 — BRUCE HOWARD

- ✓ 1. Charles Olson reading (65-day M.I. King was assassinated)  
— abstracted thru keying + tape delay
- 2. Feedback notable, 2  
dancer with tape delay - up to 19 delay images
- 3. Same dancer with feedback + keying.
- 1-3. seem historical now - but records the moments of  
discovery of basic video techniques.
- WV. only Exp. TV ctr. has kept record of process of video  
discovery, instead of just the product - WGBH et al.  
erase all process tapes.
- BH. we have maybe 400 hrs. of process tapes, only 20  
of which are possibly products.
- BH. 49 broadcasters  
dozen artists  
15-20 students  
8-10 staff - stable until 1 1/2 yrs. ago  
200 visitors - afternoon or day, or wks.  
(many from foreign broadcasting)
- SV. 2 main periods: now + early
- BH. 3: raising questions, possible answers, product.  
3rd now.

} past  
3 yrs.

Rotary - trustee, Her yr, go go became staff  
Gwinn - worked 3 yrs, as artist, Her left last  
yr, to go back to ptg. & NYC.

Beck - on staff, came '71 from Univ. of Ill. - electric engr.  
BH - only person still left on staff from beginning.

Beck in '71 came with the idea of eliminating the optical  
system, work with pure electronic image.  
got NEA grant, ~~made~~ <sup>started making</sup> what turned out to be his  
synthesizer.

✓ 4. Stephen Beck / Warner Jepson - Illuminated Music, end #3,  
& all #4

jam sessions - improvisations between sd. & vis.  
(#3 & #4 prob. same piece redone)

5. Willard Rosenquist,  
35mm slides - video as cave

→ 6. Irving Bridge, Wm. Gwinn / sd. Warner Jepson  
(Videospace electronic notebook, #2)

started with postapak, ~~mixed from 3 sources to 1<sup>st</sup>~~

~~built up~~ <sup>transferred</sup> to 3 · 1" tapes, then mixed from 3 cameras -  
took about 7 mo.

self-keyed & colorized

Quantizer - processes up to 12 inputs (makes 8 layers)

→ To Ann ~~Keiger~~ Kyger, poet & conceptualizer  
Descartes May 1968 with crew  
(12 people)

sd. Richard Feliciano  
crew - Bob Zagone, III

VASOUKAS/10-18-73

(EMI Extra is coming.)

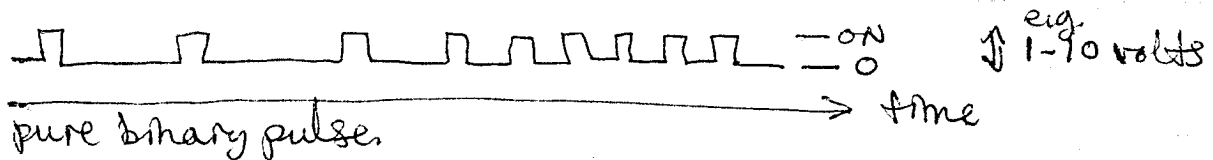
Stephen Beck - not really, avant-garde in his imagery, but heroic in his effort to make imagery - has musician's discipline to practice every day.

Important to us & anyone trying to deal with the image systematically.

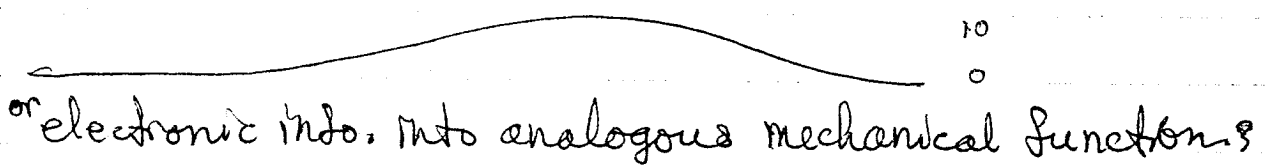
locked into his synthesizer, which is very centered, symmetrical.

Very mathematical - vs. say Park, who without math mind takes image into his own hands. Beck has a digital mind, Park an analogue mind in his approach.

digital.



analogue function



Beck uses lines as voltage-to-location conversion - easier than point-by-point design. Digital, but not as far as it can go in control.

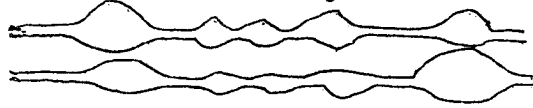
most work in analogue - hand moves to switch or knob - need digital to analogue converter to interface 2 systems.

digital colorizer in NYC - but has switches between pure color levels - can't get smooth transitions, until redesigned.



Beck - 80% of machines are analogue, but 20% are pure digital input. Always has a feedback loop cam. - smooths out digital switching.

Scanning is analogue, not digital -



voltage levels vary with light + dark, not binary - shows half-tones.

Stephen's synthesizer is very personal - has no students, no one else can make sense out of it.

'Words' (sequences of digital bits) + routes are controlled digitally in Stephen's system.

SF Video Ctr. has 2 pieces of exclusive equipment - Beck's synthesizer // + the quantizer - a 12 input keyer/colorizer.

West Coast got into very similar works, approaches. Because of working together on same bench - the quantizer.

Rosenquist is 65 yrs. old, pure ~~child's~~ mind, works with movement of light - exciting when there, but not when only on screen.

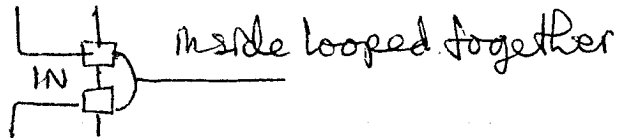
(SF group work with black drapes + incense - spaced out, not into excitement.?)

Vasulka's only interested in generated image, which is only a small part of video - rest of West Coast besides Beck is electric, not electronic.

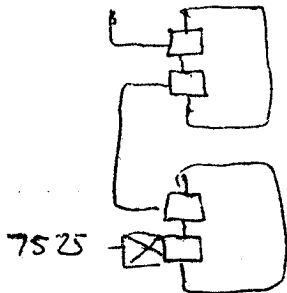
WV so naive, primitive that I'm embarrassed to talk about  
any composition in video yet -  
interested in what it might become -

### CONNECTIONS

most equipmt. has 2 ea. of inputs + outputs, e.g. keyer,  
monitor, etc.



applies to any non-terminal equip., so can loop through  
& continue circuit.



~~only~~ must terminate at end of series.  
use either internal term. (75Ω switch)  
or external term plug (resistor)

doesn't matter much with small system - but with 10  
monitors in a circle, without last one terminated,  
<sup>makes</sup> blurry, unstable image. signal 'leaks out'.  
can loop thru a monitor en route from cam. to keyer  
to preview image.

SEG. Sync buttons - internal, external, VTR,  
single cam. does not require ext. sync drive -

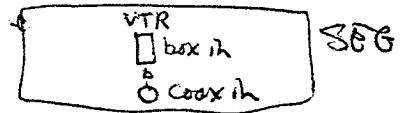
int. to sync 2 or more cam.'s, must provide internal sync from place of mixing - (not the only way) use int. button.

ext. ext. - use for master sync for multiple location work, e.g. receive sync from ICC. wd. use HD + VD on back of SEG, plug in drive pulses from elsewhere & use ext. button.

or<sup>s</sup> e.g. if 8 cam.'s in this room, SEG only handles 5 - so wd. have to use 2 SEG's, one as master, 2nd as slave. Master SEG wd. be int. plug, <sup>plugged</sup> HD + VD outs. taken to slave SEG HD + VD ins, <sup>push</sup> slave ext. button.

gen.lock  
→ VTR

parallel 2 inputs for SEG - <sup>for VTR</sup> 8-pin or coax.



For VTR tape playback, ~~or to record off the am,~~ use 8-pin to 8-pin connector.

gen.lock provides HD + VD from composite video signal - can play back only from 1 tape.

to record off the am, coax input easier, but still push VTR button to take sync off VTR input.

CAPSTAN-SERVO SYSTEM plugs in external VD syne for editing, controls mix of 2 tapes locked in vert., but rolls constantly horizontally.

Not in 2" possible to drive multiple tape decks from ~~to~~ single HD + VD <sup>syne</sup> drive, but not in 1/2" because wd. make decks too expensive.

possible to control CMA's from SGC Int. Syne  
because electronic. can't control VTR's because  
mechanical rotating heads are impossible to  
control inexpensively.

←

VASULKA's / 10-23

- WV "gave it a name just for reference, the title always comes just like that."  
"The beauty of art is that it always comes just when we expect it the least."

### TAPES FROM CLASS

1. Self-Portrait ← Barry
2. Crescent Phases 1 + 2, Great Balls of Fire — Bill Jungels
3. Light Prayer, Out of Sight — Ron G.

#2 done with double feedback — 2 cam.'s aimed at same monitor, one ~~with~~ slightly off center, 1 keyed into other, only 1 small lamp as light source.

#3 — lighting for spec. effect — so feedback radiates light out of ~~the~~ brightest point, eyes.

center (feedbk), periodicity (feedbk), hi contrast graphic imagery — common to all 3.

---

### PTG. ON VIDEO

Magnific, colorized (from b/w repro) "The Banquet" —  
source of Vasulka tape — Slying bread  
how many cam.'s to reproduce with motion?

Op -

~~Op -~~  
closely placed lines - camera + mon. registers 'Moiré' patterns - eye no longer has difficulty reading original image, but cam. does.

closely placed dots - cam. can refocus dots into 4 different planes of optically created <sup>pixels</sup> dots.

Dali - source for chroma key - child lifts the sea - ed. be done with blue paper keyed <sup>+ superimposed</sup> into ocean

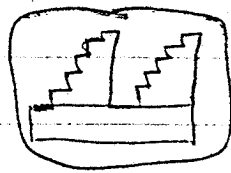
Escher - multiple modes of organization - 'Day & Night' = left to right - organized by time; top to bottom - structural transformation of fields to ducks.

center <sup>bulges</sup> 'bulges out' - optical = fish-eye in ctr.; electronic = raster manipulation like BM 6tra.

Vaserey = makes similar 'bulges'.

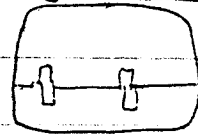
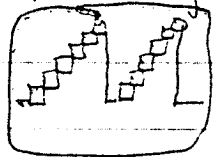
### VIDEO SIGNAL.

color bars on scope reads out staircase pattern (as if picture was laid on its back + voltage levels became heights)



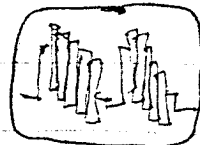
Front porch + back porch on sync pulse (see TV Measurements)

in color + chroma - plus color 'burst'



as intra. by OR sync pulse

Test Signal Generator is actually a synthesizer - generates b/w levels + color bars.



color bars

color generated on signal by phase shift (see TV Meas.)

colorizer

colorizer plugged thru Test Sig. Gen. to change colors of color bars & read out result on scope, makes new colors by altering phase shifts - strips original chroma & re-assigns new color, new phase shifts, according to b/w levels.

or, starting with b/w level bars - makes alternate color spectrums.

CHROMA - adds color, from b/w to full color, <sup>at 1st switch - turns on</sup> color burst

BLACK LEVEL - set has to have blk. before it can have white.

blk. acts as ref. for white.



blk.



raised blk. level

LUMINANCE - changes white level - <sup>gain</sup> keeps white peak at 1 volt

PHASE A - } each rotates phase shift 180° - switches under  
PHASE B - } knobs reverse the phase shift (2 knobs to make total 360° - 0)

CHROMA MOD - increases color separation

DETAIL - sharpens edges, 'detail enhancement'

knob in back - ~~gain~~ system gain - can freak out image

can place colorizer before or after keyer for different effects. (before > only one plane of 3 is color)

also here for a day:

Video Distributor Amplifier - for multiple mon.'s

Pulse Distribution Amplifier - for multiple cam.'s

colorizer or fable, - acts something like a keyer, or  
instinct - changes levels.  
much more variation of levels with keyer.

don't need light for fable, once you get it started -  
'get it burning, like a little fire in a cave'

—  
SUBTLE COLOR - go down on chroma, up on luminance



VASULKA'S / 10-25-73

sv The whole system drifts, sometimes one keyer works better than the other.

Interference can also happen by overloading cam. with too much light - because system is simple, doesn't cancel out overload like broadcast system.

Overloaded image won't record well - <sup>will breakup</sup> no AGC or deck, so adjust manually to keep gain from going too high.

wv Every time you go thru input & output, causes slight delay - hence image moves slightly to right.

Can cause echo or reverb effect - repeating lines to right.

Composite video signal = video image + sync (HD + VD).

Vertical Interval switching -  
(30 frames, 60 fields)

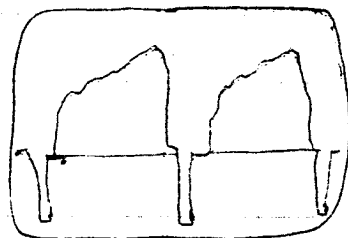
Neg. pulse erases image after each  $\frac{1}{60}$  sec. field; (interlaces

in order to lower flicker perception & make 60 pulses/sec rather than 30) - blanking (blanking?) after ea. image

Vertical interval switching places new image in sync moment when there is no image -

Blanking occurs 60 times a sec.

Transistorized switch (gate controls pulse, holds it until gap between fields) switches much faster than field-time.



SEG

switching

SEG negative — inversion of voltage levels. <sup>processed image.</sup>

superimp. — doesn't process signal, only adds 2 signals together.

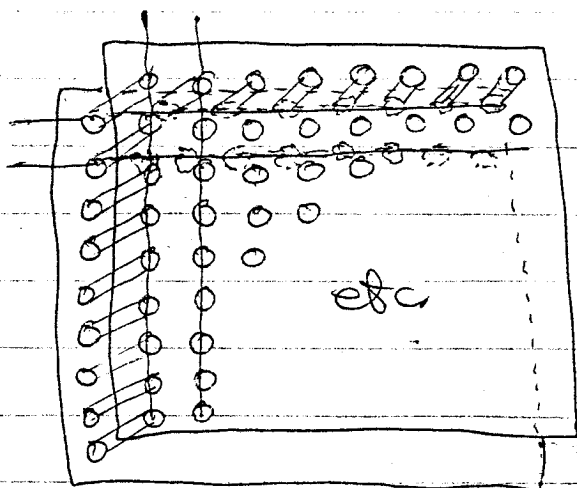
Ematte — linear switching of one image to other, again not a ~~process~~ processing of image signal

clarification: we're talking about image processing, not "signal processing" proper, as it wd mean to a studio technician, who works on whole signal for accurate reproduction.

CLASS TAPES

spiral, lamp, torn image. — Mark C. + —

MATRIX

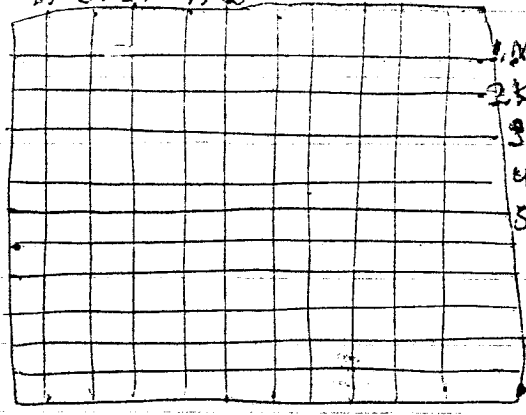


upper deck  
wired vertically  
(inputs)

lower deck  
wired horizon  
(out)

MATRIX IN →

- 1. CAM. 1
- 2. CAM. 2
- 3. KEY #1 OUT
- 4. KEY #2 OUT
- 5. color out



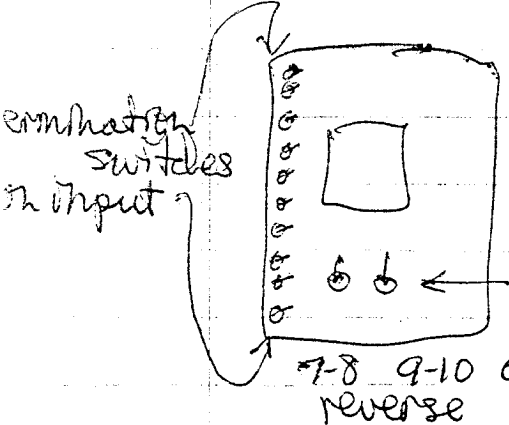
MATRIX OUT ↓

- 1. MAW ~~OUT~~ (OUT) } 1st keyer
- 2. KEY OUT (OUT) } 1st keyer
- 3. MAW } 2nd keyer
- 4. KEY } 2nd keyer
- 5. colorizer

PROGRAM OUT

can plug 1 input into multiple outputs. —  
 e.g. key 1 cam. into itself. — (i.e. plug cam. 1 into both main and key of keyer 1.

will adopt some standard system for class —  
 e.g. IN 1, 2, 3 for cam's / 4 empty / 5 1st key / 6 2nd key /  
 7 color / etc



only use for <sup>reverse</sup> switches — to make a fast switch from one page deck to another.  
 Term. switches — sometimes useful for controlling keying.

cannot insert color into key of mat btw image -  
because sync pulse + color burst are stripped  
from key image.



try: colorizer on mat / suphp. over <sup>via</sup> key input oscillators  
in color - ~~go~~ colors wd. beat against each other.

res colorizer + key -

must have colorizer ~~at~~ <sup>in</sup> mat ~~before~~ going thru keyer.  
(will lose color on key input)

can use sd. input also thru matrix - use preamp  
signal only (up to 5 volts max), not amplifier  
signal.

OSCILLATORS

red mat  alligator clips to coax  
black ground 

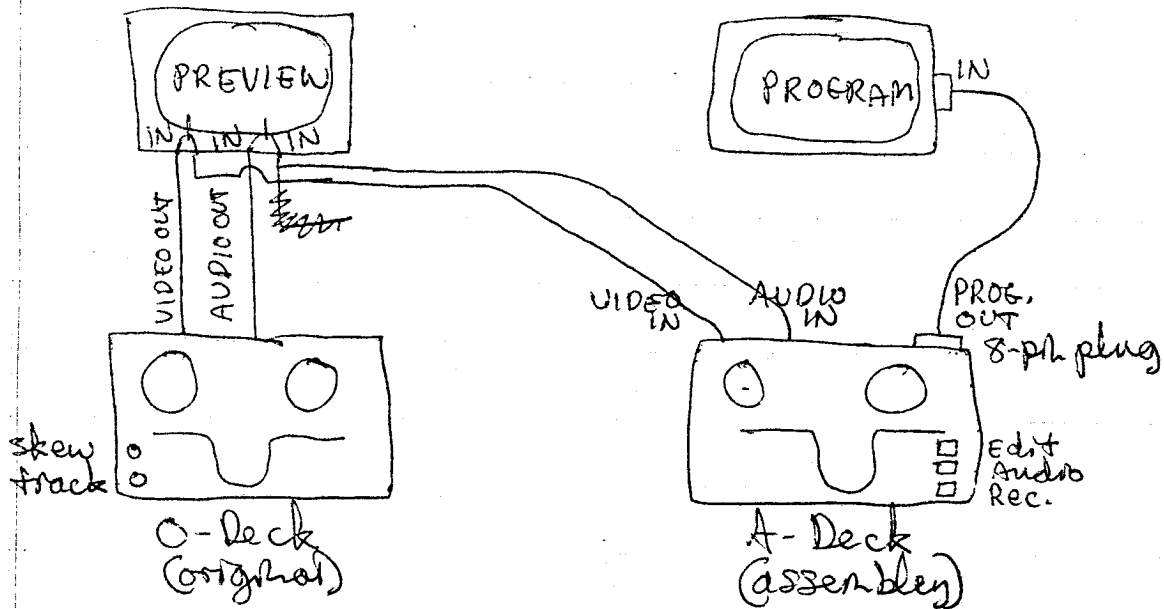
VASULKA'S/10-30-73

→ check into room + equip. for continuing work after semester is over.  
conflict with audio rm. / library / printer, etc.

The Kitchen set up with MITRAL State Council grant of \$5000, which went for rent - + voluntary work.  
pooling of equip. created the kitchen.

VASULKA'S / 11-1-73

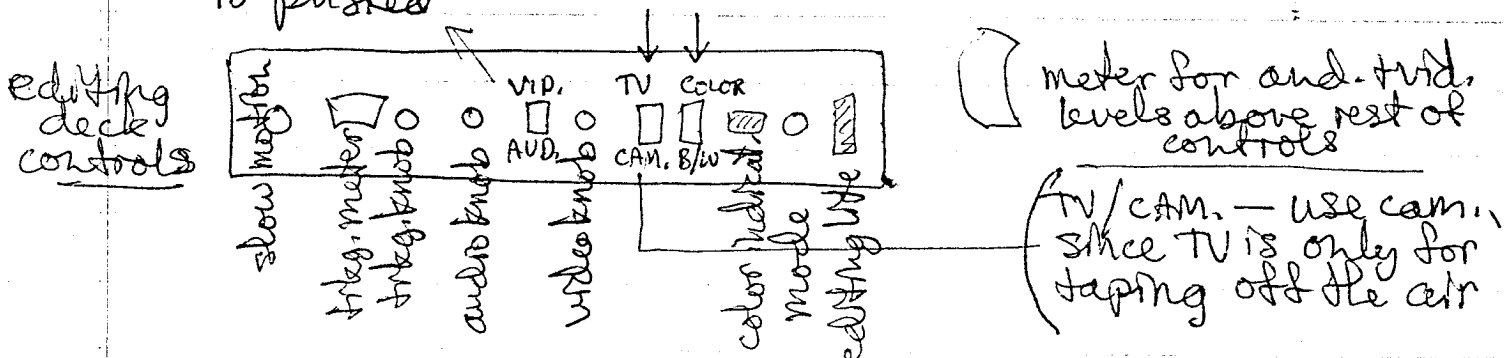
EDITING.



loop thru video in (2 plugs) or monitor — not video out, which is for recording off the air.  
 all mini plugs except audio in on Panasonic deck, which is an RCA plug.

check tracking + skew if image is bad on original.  
 don't use track + skew on A-Deck — only on playback, not on record.

image appears on prog. monitor as soon as rec. button is pushed



switches

keep TV/cam. on com.

tape b/w or b/w — col. position makes for extra  
graininess, etc.

set aud. - vid. levels to peak at line between ~~norm~~  
normal + red.

mode

insert  
edit

normal

assembly  
edit



normal — for playback + record.

a.e. + i.e. — for edit button

a.e. — can start with a.e. or rec. to start, <sup>1st image</sup> doesn't matter

a.e. overlaps one sect. after another

methods of coordinating rollback of 2 tape decks —

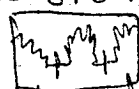
1. mark capstan / 3. stopwatch.

2. Vasulka method: set both decks at 000 at point  
of edit. / roll forward to 005 on A-Deck,  
read O-Deck (006, 004, 008, etc.) — then roll  
back to 995 on A-Deck + compensate on  
O-Deck (994, 996, 992, etc.)

time for decks to sync up — co-ordinates timing of  
sync pulses in cycle



O-Deck



A-Deck

must be in phase

image breaks up when playback'ed in a.e. or i.e. mode  
instead of norm.

deck always erases a little bit at end of each seq. =  
as soon as tape is switched off, image cuts to  
snow / but tape rolls past erase head briefly to  
mechanical stop.

i.e. — edits in image without disturbing cue track  
(sync pulses).

Cue track — registered on tape from sync pulses



i.e. is supposed to be to insert image without erasing  
sd., leave sd. intact — but due to maldesign  
of Panasonic, i.e. erases sd. as well as vid,  
but i.e. still good for ~~switch~~ clean switch out of  
inserted image to orig. image — after a.e. you  
get a moment of snow each time.

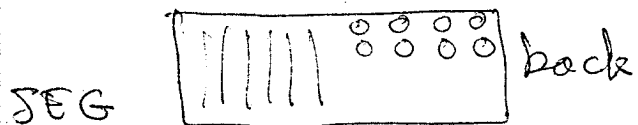
can monitor thru record deck without recording,  
by pushing rec. button (will hold down) without  
turning handle for roll forward.

this is capstan servo editing, because capstan  
is locking into incoming signal, (servo = motor<sup>3</sup>)

to edit from 2-3-4 decks — use external sync  
pulse / have to have 3-4-5 decks like Panasonic  
with capstan-servo capability (to adjust tape  
sync to ext. pulse) / even then can't superimpose  
2 tapes thru SFG, because only VD is ~~synced~~ synced, not HD

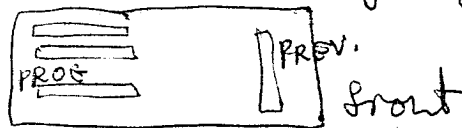


Professionals now use computers to control editing rollbacks. / so even film is being transferred to video now for computer editing - because much faster, can edit whole film in 2 days.



double row, upper right - HD, VD, BLK., SYNC IN'S.  
blk. - pulse between each field to clear the screen.

program out / preview out on blk., lower right - connects to separate banks of prog. & prev. buttons on front



so can set up special effect, e.g. key, on prev. before punching it in as prog.

woody

VASULKA / "Electron as Art" / 11-5-73  
lecture

disorganized freq.'s = snow  
organized freq.'s = signal

freq.'s = 0-100 touch / 40-15,000 or 20,000 sound / light / heat / x-rays

VASULKA'S / 11-6

matrix can super cam's 1 + 2 as prog., but feeds back to super on prev. mon.'s 1 + 2 as well.  
to corrects shd. have built matrix with diodes, so signal wd. go only one way.

self-key's put same cam. in both Math + Key.

balance of keying depends not only on keyers, but on termination switches. (on keyers, in)  
(Keyers put out high output - term. can lower signal to proper level.)  
+ can also balance by F-stops on cam's.

low freq. osc. can be used to make slicker in image —  
hi freq. can make waves thru image. (plugged thru keyers?)

use 3600 to record btw — has higher resolution, + AGC.

new small color cam's — can't be switched thru SEG/or wd. shift color on faces<sup>etc.</sup> color phase drift. timing pulse problem goes from microsec's (btw) to nonasec's (color).

e.g. even network color at watergate hearings wd. shift so that by end of day cam.#1 wd. show green faces + cam.#2 red faces.

## MATRIX TODAY:

### Inputs

- A. cam 1
- B. cam 2
- C. SEG out
- D. key 1 out
- E. key 2 out

### Outputs

- 1. Key 1 Mash
- 2. Key 1 Key
- 3. Key 2 Mash
- 4. Key 2 Key
- 
- 9. Titlator, colorizer, etc)
- 10. output (mon. → to deck, etc)

## audio

### AUDIO SYNTHESIZER.

one of the simplest. - only 3 osc's. / works like video in many ways  
(matrix osc's, etc.)

SOURCES: 3 osc's,

noise generator

trapezoid

TREATMENTS: envelope

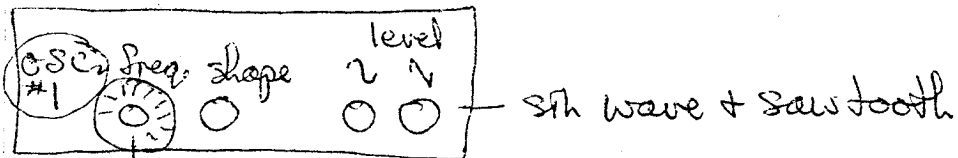
ring modulator

reverb

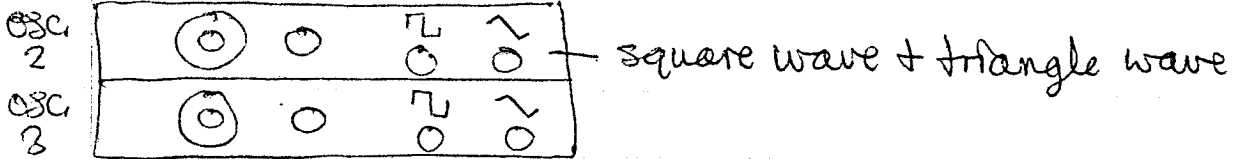
filter

trapezoid (sometimes)

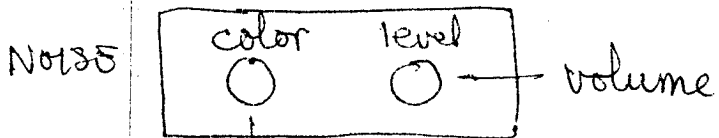
WV don't understand trapezoid very well  
system can be provided with outside signal - microph.,  
deck, etc. - which can then be treated.



provides signal controls voltage - 0 to ... / pulse 1-per-sec  
to above hearing. controls pitch




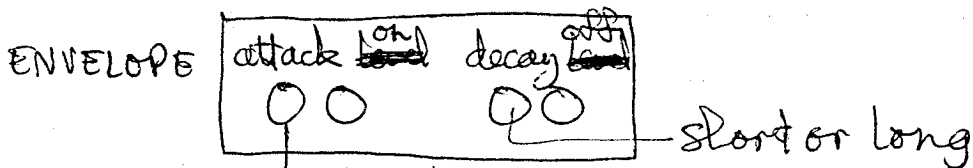
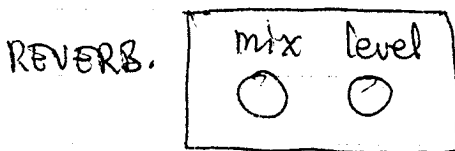
like video, can get interference patterns by placing two close osc. signals together (beating).



white noise - low or hi pitched (bass or treble)

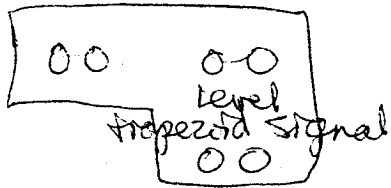
✓ noise can be filtered for control.

✓ RING MODULATOR  "works like keyer" - combines 2 signals, gives sum + difference freq.'s, eliminates rest.



short or long  
get tone ~~with~~ pushing red button, or by internal cycles.

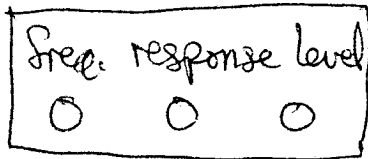
ENVELOPE



'bounces' the tone <sup>pitch</sup> up + down  
level controls how much higher + lower  
also faster + slower

- ✓ osc.'s can be controlled by external freq.'s., e.g. by  
sine, square, sawtooth, or triang. waves, or by stick,  
or can be controlled by external input.

FILTERS



Filters pass thru selected bands +  
cancel out part of signal.

vid. - vfd.  
interface

can use video signal as freq. input for sd. — 'sd.' horrible'  
then filter, reverb. ('makes it more profound, but still, n?')

2nd.  
audio

DIGITAL/SEQUENCER.

Sd. generated from square wave. — ~~4 sources~~  
pitch + volume controls.

sequencer: organizes cycle (4 tones, or 8 tones by  
repeating at higher pitch) — etc.

can develop long ~~sequ~~ sequences — 1 minute or 2 — that  
don't recognize as repeating.

then can process thru synthesizer.

VASULKA'S / 11-8-73

Class tapes.

- Chris - 1. fan shaped Idblk.  
2. slat "  
3. spray + cup "  
4. curtain + blk. chr. "

woody's "1st dramatic, emotional stage"  
stela's "1st to deal with space"

Ralph - sd. generated image, without sync pulse } <sup>WV's</sup> "not image-making approach, so much as a structural approach."

WV 2 philosophies - Chris stands behind <sup>involved.</sup> cam, or image; Ralph creates a structure from outside.

more tapes

Mark - <sup>RTA</sup> picture contains white sparkles, which become big white dlob + then contains picture again (double key)

BM + B. Jungels - sequencer sd., sequencer lites + Idblk.  
For Mage

Susan McGav. Tony - osc. abstractions



## COLOR.

add chroma + color burst to b/w signal.

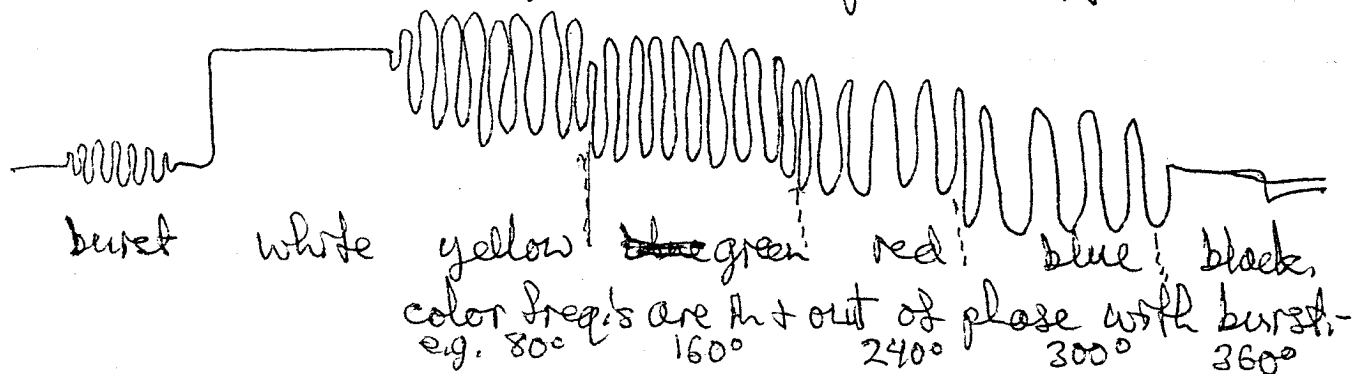
~~chroma signal.~~

burst is reference - slightly yellowish band to left of frames

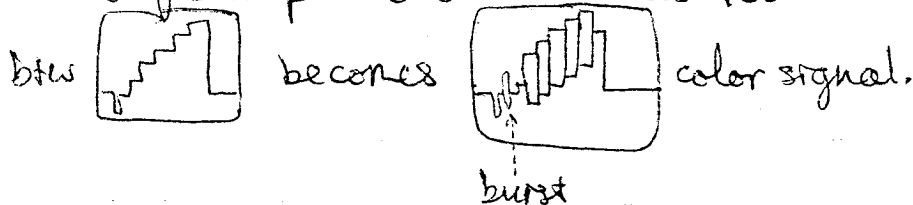
chroma is mixed out of basic 3.5 <sup>mega</sup> cycles burst freq.?

✓ phase shift described by  $0^\circ - 360^\circ / \text{freq. of signal}$  in + out of phase for chroma.

✓ burst is reference freq. for chroma phase shifts.



can be superimposed or staircase, so:



signals: HD, VD, sync, voltage levels, burst, chroma

all timed in nano sec's.

oscillator inside color set locks on color burst as ref. for decoding chroma info. from line to line.

oscilloscope registers image by scan deflection vs. video tube's scan sweep (of 525 lines)

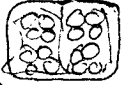


'The resolution' - ~~no~~ optical measurement, by chart -  
not related to 525 lines of video tube.

WOODY VASULKA / 2nd lecture / 11-12-73.

no physical frame in video [metaphysical frame] -  
frame created by signal.

frame pulse is negative, hence appears black on screen.  
can be reversed to white. // use keyer white/black  
switch to select out frame + make it invisible.

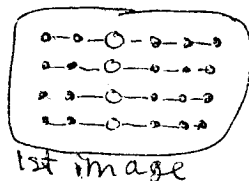
tape: grid  moving horizontally (timing pulse  
adjusted), with feedback - makes grid into  
moving cavern.

Nam June's anarchic method vs. ultra-disciplined timing  
structure of video image (Beck's approach)

Electron beam in set, normally aimed at center of  
screen, is forced into continual scanning by  
two electromagnetic control systems - horiz.  
& vertical deflection.

[left to right, top to bottom organization of space -  
vs. alternate spiral order of sweep at beginning  
of tv - influence of typewriter on spatial organiz.]

Roster manipulation - surrounds deflector system of  
set with alternate deflector system to re-deflect  
image.



VASOLKA'S / 11-13-73.

### 3-D ILLUSIONS.

Filter one eye with colored gel, or equal density filter, polarized sun glasses, etc.

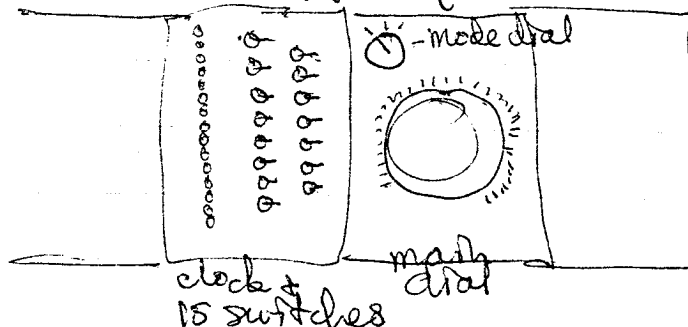
delays info. received by one eye, so with moving image (pans, feedback, etc.), creates illusion of depth — gives 2 eyes slightly different images.

based on experiment with pendulum — in which one filtered eye creates illusion of circular rather than parallel motion.

use on snow: creates depth & slow. / adjust contrast & brightness — for celestial patterns.

### HI-SPEED SWITCHER.

connected with sequencer.



mode-dial controls speed of sequencer-clock — from very slow, up to switching every 4, 3, 2 fields or every other field.

switches control order of switching in 15-part sequence (2 to 15 — can be limited to 2 or enlarged to as many parts as 15)

mode-dial switches mode-dial from control of speed to control of number in sequence. mode = 3 = single frame insertion.

changing every field = <sup>(almost)</sup> superimposed images.  $\frac{1}{60}$  sec.  
changing every 2nd field = highest degree of flicker.  
 $\frac{1}{30}$  sec.

---

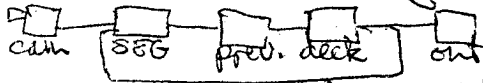
hi-speed switcher built primarily to mix alternate color fields.

this switcher unfortunately has only 2 inputs -  
shd. have 6 [or 15?]. [a matrix to coordinate  
inputs to sequencer switches.]

can switch cam. 1 / face with cam. 2 / side blk. -  
makes combination of images in mind, so that  
head appears to melt, or turn, or spin -  
or switch into spiraling blk.

VASULKA'S / 11-15-73

electronic fdbk. (or 'reverb') -



thru Y, after several pieces of equip. + back to SSG makes delay - with neg., makes stripes to right



VASULKA TAPES

~~Flying Discs~~ Flying Discs

computer reel on wall, moving by ~~top with~~ by VD adjusted (2nd image, smaller, supimp.) by VD adjustment, with electronic fdbk., colorized supimp.; no key - <sup>sync pulse</sup> ~~scan~~ line shows, designed for crde of mon.'s.

Shapes

cam. on mon. (2ndary loop) - at 90° to mon., so scan line interference pattern slows (cam. + mon. not in sync) at 45° upper rt. to lower left.

Golden Voyage (homage to Magritte)



Magritte ptg.



2001 bread <sup>hovers</sup> over seashore (bread on turntable)



bread rises over Manhattan rooftops (bread rotates on turntable)



bread + naked woman



'traffic' - multi-levels of breads (turntable, 100% VD, etc.)



bread in cosmic fdbk. environ.

bread over Iceland coast - man talks from far to near - ead meets man

lot of genlock - e.g. Manhattan rooftops on portapak tape, in neg., white sky becomes blk. + keyed out. 2 colorizers, 3 inputs - so some layers btw, some color.