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TEST TARGET DISPLAY, AN M.F.A. PHOTOGRAPHY PORTFOLIO AS APPLIED TO OPTICAL LASER DISC

by

Ronald Joseph Gregory

Submitted in Partial Fulfillment of the

Requirements for the Degree

MASTER OF FINE ARTS

MFA PHOTOGRAPHY PROGRAM

SCHOOL OF PHOTOGRAPHIC ARTS AND SCIENCES

ROCHESTER INSTITUTE OF TECHNOLOGY

ROCHESTER, NEW YORK

MAY 10, 1987

John Pfahl, Chairperson
Professional Photographic Artist

Robert P. Keough
Professor,
College of Fine and Applied Arts

Malcolm Spaull
Professor
School of Photographic Arts and Sciences

John J. Dowdell
Tape House Editorial Company, New York City

Permission Page

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Date 5-10-87 Signature Ronald J. Gregory

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John Dowdell
Bob Keough
Malcolm Spaull
Russell Kraus
Elaine Spaull
Bob Murray
David Cronister
Steve Wunrow
Richard D. Zakia
All my fellow classmates that participated in the project

I would also like to extend a special thanks to John Samaha for friendship, good times, hard work, high speed, much air, and to James Lyle for a lasting friendship, concern, technical advice, and for sharing ideas about art throughout the development of "Test Target Display."

Without Adolf and Thelma Grunbaum's subtle reminders I would not have seen this project through to its completion.

My father, Curtis Gregory and his wife, Loretta, made the entire project possible with their financial help and encouragement.

And finally, I want to thank my wife Barbara Grunbaum whose undivided love provided me energy to complete "Test Target Display."

TABLE OF CONTENTS

INTRODUCTION

By way of introduction, it seems appropriate to reflect upon my artistic endeavors prior to graduate study and how my interest in the use of high technology in art eventually led me to the production of "Test Target Display," a laser videodisc.

After completing my BFA degree in studio art, I searched for employment in a related field. As an undergraduate, I had developed a serious interest in photography and was very fortunate to be hired as a biomedical photographer at a teaching hospital. This position provided me with access to excellent darkroom facilities, as well as many scientific instruments used in medical research image recording. My job required a proficiency at operating this equipment and I quickly found a way to integrate these high-tech image makers into my own work.

After regular work hours I was allowed to use the facility for whatever purpose, as long as no profit-making was involved. I had access to photo-microscopes, electron microscopes, video cameras, and a Xerox color copier. I utilized all of these devices in one way or another to produce the artwork I created during those years. An example of my work during that time is a series of portraits which began as single transparencies. Pictures were then mapped in an overlapping fashion using a photo-microscope at high magnification. The resulting photographic transparencies were then printed using a Xerox 9500 color copier and finally assembled to create a large photographic mosaic. High tech media became a very important element in my work.

Graduate study at the Rochester Institute of Technology (RIT) provided me with the opportunity to continue a serious investigation into the process of photographic image making, as well as a chance to explore even more new technologies to communicate my ideas. Little did I know that my early interest in photography would lead to an even stronger interest in the newer medium of laser videodisc technology.

I began investigating videodisc technology at the end of my first year at RIT (1981) and consequently learned how to produce a program utilizing this medium. At that time, there were no courses available in videodisc design, so all of my research had to be done independently. I was fortunate to be surrounded by teachers and advisors who supported and encouraged me to investigate this medium. The MFA Photography thesis requirement provided an excellent opportunity for this independent study. I must admit, however, that with all the RIT course requirements, electives and work study programs, learning a new medium seemed to be an overwhelming prospect at that time. This report is an attempt to document the process I went through to produce "Test Target Display."

WHAT IS A VIDEODISC?

The laser videodisc resembles an LP record in shape and size. It is twelve inches in diameter and polished silver in color. Quite often, depending upon the ambient illumination, its surface refracts a full color spectrum of light, in the same manner as a glass prism. A cross section of the disc reveals a composite of two layers of stamped metal discs containing the program information, incapsulated in a polyvinyl plastic protective outer layer. In 1982, only two companies in the United States actually mastered videodiscs on a large scale due to the complex nature of the process. Both companies required a 1" broadcast quality video 'premaster'tape from their clients in order to master the disc.

During the mastering process, analogue video signals recorded on the premaster videotape are converted to a series of non-reflective pits and reflective plateaus by stamping them into metal grooves similar to that of a conventional LP record album. These grooves are then able to be tracked and the reflections read by a low energy laser beam which decodes the reflection back into the original analogue signal. Often the 'pits' and 'plateaus' are compared to zeros and ones associated with digital data and computer technology.

Laser videodiscs have certain distinguishing technical features making them a truly unique medium and one which offers the user more flexibility than ordinary videotape. Videotape is like film in that it is linear, which means you start at the beginning

of the program and it runs through to the end. Also like film, videotape is made up of single frames which when seen sequentially, give the illusion of motion. One would rarely view a single frame of videotape because of the resulting wear on tape and playback heads of the playback machine. That is not true of a videodisc.

Once a videodisc is loaded into the playback unit, the turntable begins to rotate at 1800 revolutions per minute. Simple mathematics reveals a rate of thirty frames a second with each revolution representing one video frame. Laser discs are capable of storing up to thirty minutes of motion video on each side of a disc in a regular 'play' mode. In single frame playback, a total of 54,000 individual frames can be stored and read per side. The player is also capable of rotating on a single frame for an indefinite period of time without damaging the disc. This is accomplished by the use of a laser light beam instead of a stylus in contact with grooves of a record, or a spinning record/ playback head in contact with magnetic tape. Each frame of video is numbered and can be accessed within seconds.

The laser disc has the ability to store two independent audio tracks, each being thirty minutes in duration per side. Audio tracks can be used to store digital program data as well. Digital audio track, or 'data dumps', are used to load disc player memories for more sophisticated program control. Furthermore, under computer control, the laser disc player can perform any combination of its playback functions depending upon user input. These characteristics make it a powerful interactive tool for computer-based instruction, training and educational use.

The technology is most often used in computerized self-paced training systems developed for companies by instructional design teams, and examples of a few applications using interactive laser disc are as follows:

1. operation of complex computerized system;
2. large visual data banks for stock photo houses;
3. numerous military applications from tank tread replacement to flight simulation;
4. point-of-purchase, point-of-sale kiosks located in shopping malls and large department stores;
5. adult literacy programs;
6. numerous medical applications such as CPR training and arthritis patient care.

It becomes obvious that videodisc is more than just a substitute for linear videotape but rather a powerful tool used to train, to educate, and to store large amounts of useful information.

HOW WAS THE IDEA FOR "TEST TARGET DISPLAY" DEVELOPED?

The original idea for "Test Target Display" developed during a trip to New York City (Thanksgiving week 1980) with Professor John Pfahl (my eventual board chairman). During this time, we discussed "high-tech" imaging in general and more specifically the medium of videodisc. My conversations with Professor Pfahl soon evolved into the idea of presenting the RIT MFA class portfolio as a videodisc. He felt it would be a challenging thesis project for me. Though both John Pfahl and I knew very little about the technology, we

were excited about the possibilities of exploring a very new medium. Professor Pfahl made arrangements to introduce me to a friend of his in New York, John Dowdell, who was actively involved in a video post-production facility and who could help me realize my goal. Needless to say, this trip to New York was a turning point in my career. The idea of the MFA portfolio as applied to laser disc, vague as it may have seemed at the time, was spawned.

In order to produce a videodisc as a thesis project, I needed to prepare an idea that did the following:

1. provide large amounts of visual information;
2. allow for a variety of media such as motion and still pictures;
3. provide a project that would be recognized as one deserving of funding (i.e., a school or group project).

Historically, RIT MFA photography graduate students and faculty produce a yearly portfolio of their work either as a printed book or a box of original limited edition prints. My strategy was to use the concept of videodisc and apply that to the idea of producing the traditional MFA portfolio on disc. This could be the first time for RIT people to publish their work in a new electronic medium. It was my chance to organize faculty and administrative support needed to successfully obtain artists' participation and funding for such an ambitious and costly endeavor.

In order to obtain institutional support from RIT, the project had to involve a sizable group of students and faculty in a learning experience. To convince adminstrators of the validity of the project's theme, it was my responsibility as the producer to

provide them a solid understanding of how I would accomplish all phases of the project, as well as a timetable for completion. This helped to accelerate my learning curve.

Producing a fine art videodisc proved to be a challenge. The first step was to learn as much about the medium as possible, and I found myself reading technical information about videodisc production provided by 3M Corporation. My next step was to begin classes in video production starting my second year at RIT. During this time I began to realize just how much there was to learn and I almost became overwhelmed before the project even officially began. As my knowledge of the medium grew, so did the number of possible programming options. I had to somehow convey all the information I learned about videodisc to those people who would participate in the project.

As producer of the disc, it was my responsibility to:

1. define all project objectives;
2. design strategies to complete those objectives;
3. solicit support in order to accomplish all of the above objectives.

So that I could carry out the project to its conclusion, each step had to be defined and successfully completed in order to proceed to the next step. Due to the nature of the process, not all steps occurred in the order I first imagined, but this was something I had to learn to live with.

In "Test Target Display," the most crucial aspect was to provide a challenge for fellow classmates and faculty to produce artwork for the new medium. Without their participation, the project would not get off the ground.

I envisioned the program design to provide enough space for each participant to submit a complete portfolio of their photographs, with a limit set at twenty pictures per person. The basic program module allotted each contributor was one minute (60 seconds) of time on the disc. This would provide slots for approximately 60 people on the program.

Within that 60 seconds, the artist had at his or her disposal 59 seconds of motion video, 59 seconds of two channel stereo or 118 seconds of single channel independent audio, 20 frames for still images and 10 frames remaining for text information providing biographical data and disc player commands.

Probably the most enjoyable aspect of soliciting project support was conducting the outreach for potential contributors of content material. Members of the graduate class, both first and second year, graduate faculty, and independent professional artists (with RIT affiliation) were invited to participate. Not all classmembers were ready to plunge into an independent project with their own work demanding a great deal of time. I had to convince them it was a worthwhile effort offering an intellectual challenge and creative stimulation. All but three class members decided to participate.

As one might expect, production for a videodisc is costly. In order to reach my goal, I had to find a way to minimize the costs of producing such a project. In my case there were no pre-production costs, except for tuition rates. However the effective price of producing a single side of a videodisc can range from $40,000 to $60,000. Production costs can run as high as $1,500 per minute whereas post-production rates vary from $250 to $450 per hour depending on the facility. I knew I couldn't spend that kind of money on a thesis project. So I looked for ways to cut costs and to obtain funding. I was successful. My last calculation showed that a total of $8,000 was used to complete all phases of production through the mastering process. That statistic could have only been accomplished under extraordinary circumstances, which it was.

I received a complementary education grant awarded through the student affairs office ear marked for video production. This grant demonstrated the first sign of positive administrative support and added to project momentum.

John Dowdell provided an honest assessment of the magnitude of the videodisc project. He explained in terms of man-hours, equipment, and dollars just what it would require to complete the project. He also provided, to my amazement, complete backing of his facility, The Tape House, to insure the highest technical quality of all program material. With this support I felt, how could I fail?

PRE-PRODUCTION

Once committed, most colleagues were anxious to learn more about the videodisc. We began with a series of workshops allowing interested parties to see and hear themselves on a closed circuit television system. The workshops were designed to stimulate each participant into thinking about the type of presentation he or she would eventually design. A second workshop followed in which a videodisc player was demonstrated. The prepackaged laser disc program hosted by "Mr. Wizard," Don Herbert, described technical features and functions of the videodisc player. A pot-luck dinner was served to round out a very informative evening.

As my second year of graduate study progressed, the winter doldrums set in and project momentum began to slow. It was at this time that Dr. Zakia, Chairman of MFA Photography, suggested we invite John Dowdell as a guest seminar speaker explaining his role in the project. Having been both a student and faculty member in RIT's photography department, John was very sensitive to all issues of concern voiced by classmates. Those issues included:

1. picture quality lost in the transfer process;
2. overall technical quality of program material;
3. actual feasibility of the project.

Mr. Dowdell had forged a highly successful business out of electronically transferring motion picture film to videotape. It was through his love and sensitivity towards photography that everyone was convinced that the project could succeed. Momentum began to pick up once again.

The next workshop allowed participants the opportunity to explore the television recording studio located at RIT's Instructional Media Services. This was where all motion segments were to be recorded. We met with the production staff and were shown how various electronic devices produced effects that could possibly be used in the motion segments. Lighting equipment proved to be satisfactory. I felt this visit was important for those people who had never had the opportunity to visit a video recording studio.

The final workshop was probably the most important of the series. Participants' ideas were discussed individually and were written in the form of a script. Classmates John Samaha and James Lyle were most helpful during this critical period. This workshop lasted three days and also provided an opportunity to collect the twenty still photographic images needed for the still portfolio section. Project momentum was at an all time high.

PRODUCTION

Production of artists' motion video segments began in March of 1982. As final studio arrangements were being made, excitement grew while everyone prepared to record their section. A release form was drafted granting both RIT and the producers complete one-time rights to use the material generated by all artists for "Test Target Display." It was completely understood by all parties of the educational nature of the disc program and that no profit would be generated from sales. Most participants had no problem complying with the terms of the agreement.

Busy production staff raced about making last minute adjustments as each artists' segment finally began tape recording. Interested bystanders stood in the wings and watched as classmembers took advantage of their chance to perform in front of or behind the camera. Films and animated segments were to be collected at a later date. Momentum remained at an all-time high during this period.

Phase Two of production involved copying all of the still images. The artwork collected ranged in form from 2" x 2" transparencies to color and black-and-white prints of all sizes to 4x5 color negatives. All this material was photocopied on Eastman color negative film stock in the SMPTE half-frame format using an Oxberry animation stand. The film and format was suggested by John Dowdell as the prime intermediate step before transferring the images to videotape. Over one-thousand images were recorded during the three and one half days of this production phase. NTID's Department of Media Services provided the facility and guidance in efficiently accomplishing this task with special thanks directed to Bob Murray for his contribution of time and guidance.

POST-PRODUCTION

Once all material had been recorded, collected, and photocopied I had to decide on the disc program edit design. By then I had seen all segments many times and had a feeling of style, pacing and content of each. Needless to say, every segment was as different and as individualistic as the artists themselves.

In earlier stages of program design, I thought it might be interesting to have all student work on side one of the disc and professional artists' work on side two. After reviewing the recorded program material, I found that most faculty and outside artist sections exceeded the sixty second mark and in some cases were rather long.

An effective solution was reached by mixing both short segments and longer segments. Continuity decisions were based on the following factors:

1. module content
2. pacing
3. style of presentation
4. artist personality
5. mood and color
6. interrelated subject matter

"Test Target Display" presented the opportunity for many visual artists to conceptualize and present an idea in the form of a moving image rather than just still photographic images. Despite the fact that it contains many still pictures and is a portfolio for still photographic artists, it also served as an alternative forum by allowing each artist, in most cases, their first confrontation with moving media. How they handled the challenge proved to be both stimulating and rewarding. Artists had total creative freedom to express themselves as outlandishly or as conservatively as they saw fit. I encouraged everyone to extend themselves into taking risks. As one might expect, the full gamut of self-expression was exhibited.

Off-line editing is a technique used to assemble program material for evaluation prior to the final on-line edit phase. During this process it became apparent that my earlier design decisions proved workable. An editing decision list was generated using 3/4" u-matic cassettes with timecode superimposed over the video image. Timecode is an actual electronic signal laid down in continuous numerical fashion presenting hours, minutes, seconds and frames of video. It is equivalent to sprocket holes in movie film.

During the on-line editing process, the edit controller reads the timecode of the pre-recorded source material and searches out those sections of tape specified by the "EDL." This is why it is important to generate an accurate list of "in" or beginning points and "out" or ending points. The off-line edit session relies on the luxury of time and allows for experimentation. Once the off-line sessions were over, I had generated a list of virtually every edit that was to comprise "Test Target Display."

With the help of colleague John Samaha, we were able to negotiate the final on-line edit assembly with a local Rochester production house, JAM Productions. JAM provided us with the facilities needed to accomplish the final phase of post-production. This on-line edit session lasted the equivalent of 21 eight-hour days. Actually, most of the sessions were held during the late evening hours and on weekends when regular production was not in progress. The final session at JAM allowed RIT officials and JAM management a chance to preview the final program tape in its entirety at which time they gave their approval. A celebration was in order. The program was now ready to be mastered into videodisc.

Through a generous donation of departmental funds, SPAS Director Russell Kraus arranged financial support to master the disc. One hundred copies of Test Target Display were also ordered with a purchase price set at $50 per copy. The money guaranteed from sales was used to off-set some of the expense of disc replication. I followed the advice given by JAM Management and used Pioneer Video Corporation to master the videodisc. In retrospect, I felt this was an unwise decision because of the unreasonable time delays in delivery. Discs arrived the afternoon of my presentation, three hours before the scheduled event. I had no time to index the disc, thus hindering my presentation.

Once the video portion of the program was as complete as I could make it, my efforts had to be directed towards disc album jacket cover design. With the help of graphic designer, Susan Poulakis, and RIT's Screen Printing Department, I was able to create a custom 3 color screenprinted jacket cover printed on crack-and-peel stock. Each of the two album sides had to be trimmed and applied to the generic covers ordered from Pioneer. Two weeks were spent custom producing album jackets.

EXHIBITION

"Test Target Display" was exhibited in the A100 auditorium of RIT library adjacent to the studio in which it was originally recorded. It was presented in linear fashion using multiple monitors to allow for adjacent viewing. Audience members were allowed to interact with the disc player as part of the presentation. A 'Thesis Sharing' was conducted by board chairman

John Pfahl. During this time, I expected critical comments concerning program content or intentions of presenting "Test Target Display" as a work of fine art. No one questioned my motives or integrity at the sharing, thus it ended on a rather boring but festive note.

CONCLUSION

In conclusion, I would like to reflect upon this experience and explain how it affected me and those who actively participated in the project. For most, it was simply a chance to seize the moment, take advantage of a unique situation, and to move on. For me, it provided an opportunity to explore a new medium without restriction and utilize the vast facilities of an institution which bases its reputation on integrating art with technology.

It might be said that I was seduced by the technology. That could be true; however, most of my artistic experiences have included explorations of new technologies. That has always been a challenge for me, and once committed to accomplishing my thesis goal there was no turning back. The real seduction was in the form of having the opportunity of breaking new ground, virtually untouched by the artistic community.

Looking back, the true challenge came when others were doubtful in the probability of my success and there were skeptics who were vocal in their opposing opinions. Usually their concerns focused on how the integrity of their photographic image would be destroyed, and possibly mishandled, once stored in this medium. Their points may have been valid and I was sorry about those who

decided not to contribute. I was particularly pleased, however, that classmate Bob Cooper decided to contribute a segment that actually addresses this issue. In "Copyright" Bob's main concern deals with stewardship of the pictures and having no control once in the electronic format. He chose not to include any of his photographs on the disc. I placed him last on the program to act as an editorial spokesman, and to pose, what I thought were valid questions. I have always respected Bob Coopers opinion, and was pleased he decided to present his points of view in my project.

Overall my position as project producer provided many opportunities to work with artists whose whole reason for existence was to channel their spiritual flow of energy into forms of visual expression. One such student was Ismail Abdullah. He had ventured, with his family, from Malaysia to study graduate photography at RIT. Ismail's contribution to the disc was a striking dance performance and poetry reading. It was a very unique combination of visual, oral, and electronic effects charged with his own energy and vitality.

Probably the most effective use of the medium was executed by another international student, Alex Syndikas, a native of Australia. He used dual independent audio tracks, in both English and Italian, and created a striking self portrait for the real-time motion segment. His still photographs were a continuation of the same visual theme. All of this material was created specifically for the disc project, which illustrates Alex's serious commitment

to art. It was satisfying to me that Alex was able to harness the power of video disc by learning to express his artistic vision in another medium.

Throughout this entire project I never once thought of it as anything other than the process of producing a piece of fine art. To me, "Test Target Display" represents a melding of all the aesthetic sensibilities and communication skills I brought with me and continued to develop at Rochester. I trusted that my artistic talent coupled with a natural ability to spark enthusiasm, to intellectually challenge, and to motivate others towards a purposeful goal would result in a unique project that addresses the issue of High Technology as an Art Form.

I made the decision to commit full-time energies, talents, and tuition dollars in making "Test Target Display" be a rewarding graduate experience not just for me, but for all of those involved. I could only hope that by participating in the project my fellow classmates and faculty members did learn from the experience and that it provided an open door to take risks, explore, and finally to help understand the significance of this new electronic medium. For me, this challenge is the true meaning of art.

POST SCRIPT 1987

For the past three and one half years I have been producing laser video discs in the commercial market-place. I have seen laser disc technology evolve into what has become a remarkable tool used to train, to store information, and to enrich peoples lives. Production costs remain very high and for that reason only those

companies which are strictly profit motivated are the usual investors, concentrating their investment dollars in the area of training.

I suspect we will see more optical laser disc technology creep into the lives of general householders, thanks to the advent of compact-disc digital audio, better known as CD's. New CD based formats such as compact-disc interactive (CD-I) and the new compact-disc video (CD-V) are now being introduced and will provide a new and powerful vehicle for programs containing thousands of volumes of text information, full color motion pictures, computer program data, computer animation/graphics, and hours of digital audio all stored on a single five inch optical disc.

Like laser videodisc of the late seventies and early eighties the new compact-disc formats are touted to be the invention that will enrich the lives of all mankind. I find the new all digital format of compact-disc overwhelming with its incredible capacity to store so much information. I can only hope to have the opportunity to once again produce a fine art program that maximizes the medium as did "Test Target Display."

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APPENDIX 1

THE ORIGINAL PROPOSAL

STATEMENT OF PURPOSE:

I intend to utilize state-of-the-art optical disc technology to develop an innovative format for presenting fine art. This format will be designed to communicate the work of thirty MFA photography students and invited artists using the unique aesthetic of the optical disc.

BACKGROUND:

During the Fall Quarter of 1980 students were presented an opportunity to attend a lecture given by Gene Youngblood. The topic of discussion was the impact of electronic images on society. Youngblood gave a brief overview of how conventional photographic processes have altered gathering and distribution of information since the industrial revolution. He compared the impact of conventional photography, as we know it, with the future impact of electronic imagery, i.e., Video/Computers, on society of the Twenty-First Century. The conceptual possibilities he brought forth were truly outstanding.

A trip to New York City with instructor John Pfahl spawned the idea of applying the class portfolio to an optical disc. Conceptualizing the possibilities of this unconventional approach of presenting student work soon led to the first stages of research.

Attending a class during Spring Quarter '81, offered by Bob Keough, proved to be a valuable nexus. Mr. Keough is presently Chairman of the Communications Media Department of S.U.N.Y. At Alfred. I took a trip to Alfred in May and toured the various

facilities with him. An amazing arrary of sophisticated computers and video equipment was at his disposal. Frequent correspondence began after this trip and lasted throughout the summer months.

In late August a journey to New York City was planned with the help of both John Pfahl and Bob Keough. The sole purpose of this visit was to meet John Dowdell, co-owner of the Tape House Editorial Co., Inc. This establishment transfers film to video tape through electronic digital processing. Mr. Dowdell showed interest and enthusiasm in the class project and his technical advice has been of great value.

Since Fall Quarter '81 work on production design has begun. The magnitude of this project prompted help from fellow student-colleagues Jim Lyle and John Samaha. They agreed to help in the production of both video tape programs. Meetings have been held during which decisions concerning design, format, and budgeting have been made. Financial support has been solicited from the Director of the School of Photographic Arts and Sciences, Russell Kraus, and from the MFA Coordinator, Richard Zakia. I have also scheduled studio production time with the Instructional Media Services Department located in the Library at R.I.T.

The proposed program design consists of two twenty-eight minute video programs. One side incorporates members of the MFA Graduate class presenting themselves and their work, creatively utilizing the unique qualities of the optical disc (film to tape, single framing, random accessing, stereo sound, real-time video recording). The second side will consist of sections submitted by nationally and internationally known visual artists who use video

as a means for communicating their ideas. These artists will be selected on the basis of reputation as well as their association with the RIT community.

Exploring the Fine Art possibilities in a new high technological medium is a challenge I'm willing to undertake. Final editing decisions, as well as aesthetic concerns, will be my responsibility after gathering all visual program data. This project epitomizes RIT's doctrine of blending Art with Technology and, while doing so, enables me to utilize the vast facilities offered by the institution.

PROCEDURE

Technical information has been received by 3M Corporation providing the specifications which will govern making of the premaster tapes. The following steps are required for successful completion of Phase I of the project:

step 1.) Real-time video will be recorded onto two inch quadraplex video recorders.

2.) Still frames will photographed using a 35mm Oxberry Animation Crane.

3.) The information from the two inch tape will be transferred to one inch tape. A time code is to be placed on the one inch tape during this step.

4.) A second transfer will be made from one inch tape to a three quarter inch tape with a time code "burned in" on the three quarter inch tape (note: the burn in provides the editor with information concerning minutes, seconds,

and frame number, making frame accurate editing possible). This three quarter inch tape will act as a work-tape from which all editing decisions will be made.

5.) The one inch tape will be edited to make the pre-master video tape.

6.) A cue code inserter will be used to locate significant stopping points along the third channel audio track of the one inch tape. This process allows the tape to have random accessibility once mastered to disc.

Phase II of the project begins by sending the one inch pre-master tape to a facility to be mastered on to disc. During this time decisions concerning cover design and indexing will be made. Careful records will be maintained to insure accurate indexing and to help eliminate costly printing errors. Presentation of the disc will occur during the second week of October 1982. Audience interaction is expected to be a main focal point of this presentation.

APPENDIX 2

VIDEO DISC INDEX

VIDEO DISC INDEX

NAME	FRAME NUMBER
SIDE 1	
William McGuire	1020
Henk Vanderkhove	2886
Steve Mosch	4750
Robert Keough	6734
Silvia Lizama	12000
Edie Freedman	13977
Larry Lean	15855
Jon Kline	17733
Eikoh Hosoe	19881
Robert Morgan	29029
James Reilly	29109
John Dowdell	29116
Phyllys Galembo	29129
James Ninos	29147
Charles Swedlund	29167
Bea Nettles	29187
Andrew David Hazy	29208
Robert Oberhand	29247
Michael Lesko	29267
Alan Brown	29289
Diane Ferris	29308
Richard Gray	29329
Elliot Rubenstein	29350
Alexander Syndikas	29366
Robert Morgan	31038
Carl Yusavitz	31171
Chris Harrold	33040
Constance McCabe	39494
John Dowdell	41263
Erik Timmerman	45386
Richard Zakia	34872

NAME	FRAME NUMBER
SIDE 2	
Ronald J. Gregory	571
John Pfahl	1794
John & Marilyn Samaha	5136
James Lyle	7261
Jerry Uelsman	8767
Terry Murray	17885
Malcolm Spaull	19666
Howard Ringeley	29794
Barbara Bosworth	31789
Joseph Vitone	33788
Ishmail Abdullah	35643
Kirk Davis	37781
Richard Schneider	39859
Arthur Hynes	41625
Howard Granowitz	43600
Robert Heinecken	45009
Robert Cooper	48786

Ektachrome
SLIDE

PROCESSED BY Kodak

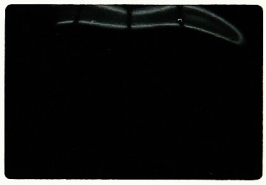
HENK VANDEKERKHOVE 12

JAMES LYLE
'KEYCUTS' 10

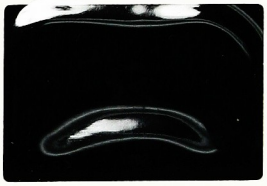
ALEXANDER SYNDIKAS
'SCULPTURE OPTIQUE' 36

WILLIAM McGUIRE
'VIDEO MAGIC' 38

TITLE FRAME
SEQUENCE 33



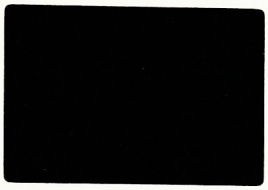
ROBERT COOPER
'COPYRIGHT' 35



ERIK TIMMERMAN
'ROADWORKS' 16

JOHN DOWDELL
'NUDE DECENDING A TREE'

EIKOH HOSOE
'THE MINI-GRAPH' 32

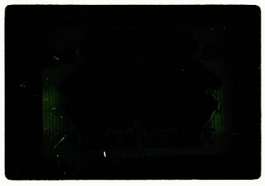


CONSTANCE McCABE
'PERCEPTUAL QUOTES FOR PHOTOGRAPHERS'

ARTHUR HYNES
'GODS AND HEROES A DANCE TRIPTYCH' 31

KIRK DAVIS
'KIRK DAVIS' 27

ROBERT P KEOUGH
'IMAGE PROCESSING'



ISMAIL ABDULLAH
WAYANG PUISI 23
SHADOW PLAY POETRY

MALCOLM SPAULL
THE WALRUS AND 18
THE CARPENTER'

RONALD J GREGORY
'DESITY AND RGB 13
ON TIME'

STEVEN P. MOSCH
'OBSERVING LIGHT, SPACE AND
TIME WITH VERVEN PANACHE'

JERRY UELSMAN
'DREAM MOMENTS' 15

JOHN PFAHL
BUMBERSHOOT 16