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Thesis

George Ring

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Date: 5/19/82
DEDICATION

I wish to dedicate my thesis to my parents, George and Ann, for without their faith and confidence I would never have come this far.
ACKNOWLEDGEMENT

I would like to thank James C. Ver Hague for giving me the incentive to become a 21st century designer.
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INTRODUCTION

The purpose of this thesis is to solve a series of design applications with the use of the Apple II and Genigraphics systems.

I will base my thesis on past experimentation with still computer graphics imagery using special photographic equipment and do new explorations using video equipment.

My proposal had been approved on 17 January, 1982. My decision to execute a thesis using computer graphics derived from my experiences entering the field from my first quarter attending Rochester Institute of Technology. I wished to use this medium to demonstrate that one can appreciate graphic design for aesthetic as well as corporate purposes. I also discovered that another design student, Don Harbison, had also attempted the task of uniting the science of computers and the theoretical and aesthetic applications of graphic design. I feel my thesis is an extension of Mr. Harbison's in taking this principle further.

Mr. Harbison stated that until a type of computer technology was developed specifically for the designer, computer graphics would always lie in the hands of the specialists. Fortunately, a computer system called Genigraphics by General Electric Company had been developed with the designer in mind. The school had acquired such a computer during my stay here and gave me a perfect opportunity to experiment with the newly developed animation package.

My thesis consisted of a variety of images programmed on the Apple II, to which some effects were created photographically
in the camera and an animated sequence for a public broadcasting network was designed on the Genigraphics unit.
THESIS PRODUCTION

Before the concept of my thesis had become a reality, I learned to write short programs using the BASIC language on the Apple II in a computer graphics course taught by James Ver Hague. There are specific statements with subroutines which are necessary to design triangles, diamonds, circles, grids, and simple lines. Through long hours and patience, I was able to manipulate the programs to create moire patterns and some animated imagery. Eventually, I decided to record my images on Kodachrome 25 color slide film using a Nikkormat FT2 35mm SLR camera equipped with a Nikkor 80-210 mm zoom lens. I attained spectacular results and therefore decided to execute a thesis after I made a substantial collection of experimental still and animated images.

Since I had mastered many of my procedures within the first year, I felt I should take the thesis images further using new and different applications.

The initial slides were photographed at Fll with an exposure time of one second. I was able to intensify my colors by altering the exposure times and shutter speeds. All of the slides were photographed in total darkness directly from the video display in conjunction with the computer.

Some of the images, although still, give the illusion of rapid movement towards the viewer. I then decided I wanted to actually animate these images. I tried a variety of experiments.

I first attempted to animate some of my still images photographically by shooting the displayed image on video
directly to videotape, zooming the image simultaneously. Unfortunately, video only records what it sees in real time. Therefore my computerized image only grew in size, instead of achieving that sparkled effect on the slide.

My next attempt was to use Super 8 film because I would be able to control the lens opening. Unfortunately, I got the same results, only faster.

My last attempt would be to reshoot the desired images in registration with each other and use the dissolve mode on a device called a film chain, which transfers film and slides onto videotape. The "separation effect" sequence was quite successful and I used it to animate a variety of sequences used in the video presentation.

My initial applications using the separation effect were rather basic, centering the image in the camera, opening the lens at F11 and exposing the image for one second, zooming the lens simultaneously. I also took the act of zooming the image further by positioning the camera at extreme angles above the television. The images were warped, giving even greater depth and three dimensionality.

Unlike the Apple II, the Genigraphics computer system did not require special programming to create graphic illustrations. The tools necessary for the designer were contained within the system, which is accessed through a keyboard console and a hand held button control.*

In order to animate the logo designed for a public broadcasting network, it had to be plotted on a grid specifically

*See Appendix A
compatible with the Genigraphics video display unit. Once this data was fed into the computer, I chose the animation mode from the menu located at the top of the display. After entering programmed data in order to activate the animation mode*, I photographed the logo sequence in total darkness, one frame at a time, at 24 frames per second. I used a Canon 310 XL Super 8 movie camera equipped with auto exposure setting and photographed on Kodachrome 40 Super 8 movie film. Measurement between the lens and the video display was necessary to confirm focus of the imagery since the camera was not capable of focusing through the lens. Unfortunately, that did not prove successful. The sequence appeared out of focus and overexposed. However, I did find the image movement to be satisfactory.

The second attempt revealed considerable advancement. I conducted this experiment using a Sankyo EM 40 XL Super 8 movie camera equipped with through-the-lens focusing, automatic exposure and an auto fading control. This time I was able to check my focus with much better accuracy. The sequence was photographed at a rate of 18 frames per second instead of the previous 24 frames per second. All of the results were positive with the exception that each individual shot caught the scanning lines of the video display, meaning the image was not exposed long enough. However, the background color was a rich dark blue and concealed most of the lines.

In order to present my thesis within a relatively small space and to save myself the trouble of a multi-projection set-up and film projector, I felt a videotape would be much more appropriate.

*See Appendix Δ.
more convenient for departmental storage as well as ease for transport when I would attend interviews.

With the help of the Instructional Media Services, I was able to transfer my slides and film directly to video with a device called a film chain. The film chain displays each image onto the videotape alternately and has the capability of dissolving and fading them. The film chain was programmed to show the images for a specific period of time, compatible to the music I chose to accompany the program. The film transfer was executed in the same format.

My choice of music turned out to be much easier than I expected. I wanted a type of music that was classical yet electronic with a futuristic touch. Being an admirer of such recording groups as the Electric Light Orchestra, the Alan Parsons Project, Renaissance, etc., I eventually came across a piece of music in my own record library by a group called Kraftwerk. The two integrated instrumental compositions, "Franz Schubert" and "Endless, Endless" (from the album "Trans-Europe-Express) proved to be what I had in mind for my thesis. They had all the qualities previously stated and in addition, ran approximately five minutes. Each image could be viewed approximately six seconds with dissolving and fading effects. I had about five seconds left over which is apparently close for such a task.

The final thesis presentation consisted of 32 graphic abstractions and the animated experiment which I felt solved the initial problem. Although I was quite satisfied with my finished product, I had hoped to achieve the streak effects
from my images as other images are executed using much more sophisticated motion control equipment. However, I now have a better understanding of the procedures needed to produce quality work using the computer in collaboration with slide, film and video production.
CONCLUSIONS

In conclusion, I feel this thesis has become the most enlightening of my experiences in graphic design. Both my development of programs through trial-and-error and my experiments in recording the images photographically proved to be quite challenging as well as satisfactory. My work in this new and fascinating medium has made me aware of the many possibilities inherent within it, possibilities which I hope to explore further as I pursue my career in graphic design.

As computer graphics systems become more sophisticated, they are also becoming simpler to use. The type of tools necessary for advanced computer animation are still in the hands of the experts and I will require additional training in mathematical skills. As these systems become more and more user-friendly, however, these mathematical skills will no longer be needed and the designer will be free to concentrate on his design problem.
APPENDIX A: TECHNICAL DEVELOPMENT

Until I came to Rochester Institute of Technology, I had no training in using a computer. My first encounter was with the Apple II, a micro-computer or, as it is more commonly known, a home computer. It is relatively inexpensive in comparison to others in the same category. Some of the other brands have improved since the development of the Apple II and their graphics are now of comparable quality. However, the Apple II seems to have set the standard as a business computer.

The Apple II is operated by means of a keyboard unit as the direct communication link between the designer and the computer. The computer language called BASIC is used to inform the computer of specific commands. Graphic display is viewed on an ordinary color video monitor or standard television set.

The Apple II is capable of showing an area of about 53,200 points of programmable display. Specific coordinates on the "x" (horizontal) and "y" (vertical) axes are designated on the display as 280 "x" points and 192 "y" points.

What I found fascinating while learning about the Apple II was the amount of information in my disk file that was developed through trial and error experimentation. Also, keeping records of this information photographically with cameras or videotape proved to be convenient.

My next encounter was with the Genigraphics computer image generating system developed by General Electric. It is a library of type styles, symbols and colors which eliminates the supplies and equipment necessary for creating graphic illustrations.
The Genigraphics computer system, Model 100C, is operated by a keyboard console and a hand-held control equipped with buttons with which the designer can choose the particular mode from a menu of options located at the top of the incorporated video monitor.

The Genigraphics unit also contains an animation mode which can be used for a variety of purposes such as my example of animating a logo for a public broadcasting network.

An animation sequence can be programmed by typing in the text mode (TXT). Data such as designation and size of the object to be animated are entered into the computer. A five digit number (usually 00001) is then entered as a counter for the number of frames needed to animate the object. Using the hand-held control, the operator first "captures" the background, then the number and enters the EDIT mode located in the menu. The operator then "overlays" the background and number in order to arrange the animation format properly. Additional data such as the number of frames one wishes to see, the before and after positions of the object, color changes and the number of frames per second the sequence will be shot are all entered into the computer. There is a preview stage for corrections, in which one can confirm calculations before filming the sequence. The animation mode is now ready to be activated for filming.
APPENDIX B: LOGO DEVELOPMENT

With regard to the animation portion of the thesis, the development of the logo design took considerable research in art history, not computer graphics. My intent was to create an image with enduring qualities, elegant, sophisticated, appealing to a broad spectrum of the population. I also decided that the design should evoke the essence of Art Deco while retaining a contemporary feel. I chose Art Deco because of its dynamic and directional form of execution. This was important because the logo had to be legible in both video and print media. Since the logo would serve not only to identify the station within its viewing area, but also to designate programs produced by the station, the call letters would be of primary importance.

I first researched as many letterforms in the Art Deco style as possible. I designed an alphabet based on what I saw (Figure 6). Taking this preliminary alphabet as a starting-point I modified it by adding lines to specific letters to make them more legible when reproduced on video (Figure 7). After I was satisfied with the basic letterforms, I concentrated on the four call letters, arranging and redesigning them to form a coherent whole. The final step was to adjust the thickness of the lines and overall size of the logo to further enhance its visibility (Figure 8).

I feel the final logo fulfills all of the criteria I had initially set. Once this process was complete, the design was ready to be animated on the computer.
SELECTED BIBLIOGRAPHY: THESIS DEVELOPMENT

Brown, Bruce Eric and Levine, Stephen, "The Future of Computer Graphics"
  Byte 5 (November 1980) No. 11:22

Dennison, Linda T. "A Beginner's Guide to Special Effects Slides"
  Audio Visual Product News 2 (September/October 1980) No. 9:37

Dennison, Linda T. "Sliding Into Animation -- Part II"
  Audio Visual Directions 3 (October/November 1981) No. 6:40

Dennison, Linda T. "Sliding Into Animation -- Part III"
  Audio Visual Directions 3 (December 1981) No. 7:27

Editors, Art Direction "Animation: The Most Modern Medium"
  Art Direction 34 (April 1982) No. 1:40

Glossoy, Pat and Jim Seale "Commercial Special Effects -- 1981"
  Millimeter 9 (September 1981) 9:82

Harbison, Donald P. Computer-Aided Graphic Design

Kenny, Michael F. and Schmitt, Raymond F.

Meistrich, Ira J. "On Air Graphics"
  Print 34 (March/April 1980) 2

Rivlin, Robert "Film and Television: Converging Technologies Part I: A Meeting of the Minds"
  Millimeter 9 (September 1981) 9:145

Sauka, Carol "How to Produce Your Own Slide Show"
  Audio Visual Product News 1 (August/September 1979) 4:48
Sauka, Carol "How to do Special Effects for Slide Shows"
   Audio Visual Product News 1 (February/March 1980) 6:58
Sorenson, Peter "Computer Imaging -- An Apple for the Dreamsmiths"
   Cinefex 6 (October 1981) 4
Sorenson, Peter "Electronic Scenery, Digital Optical Printers,
   Computer in the Near Future for Film Production"
   Millimeter 9 (September 1981) 9:108
Spina, Lillian C. "Network Promotional Campaigns: 'Proud as
   A Peacock ... Now is the Time ... To Reach for the Stars"
   Millimeter 9 (September 1981) 9:133
Spina, Lillian C. "Three Views on Video Animation"
   Millimeter 9 (September 1981) 9:168
Spina, Lillian C. "Paint-by-Pixels: Computer Power Comes to
   TV Artists"
   Millimeter 10 (February 1982) 2:81
Von Seggern, Walter "A Look at Computer Generated Slides"
   Audio Visual Product News 2 (September/October 1980) 9:66
Woolman, Robert S. "See Your Way Clear"
   Audio Visual Directions 3 (May/June 1981) 3:58
SELECTED BIBLIOGRAPHY: LOGO DEVELOPMENT


TABLE OF ILLUSTRATIONS

1. Kaleido, a program for drawing increasing diamonds with random colors.
   a. Example of Kaleido using zoom lens.
   b. Variation of Kaleido.
   c. Variation of Kaleido.

2. Cheyenne, a program for drawing tapestry patterns.
   a. Example of Cheyenne.

3. Boxy, a program that draws random sizes, positions and colors of rectangles and squares.
   a. An altered view of Boxy zoomed from the upper left portion of the video screen.

4. K Fast, a variation of Kaleido, designed to draw diamonds at an accelerated rate.
   a. Example of K Fast.

5. Origami Bird, a trial and error image.


7. Modified letterforms for logo development.

8. Final logo design.
https://pastebin.com/pB3vKvKr
JCHEYENNE

?SYNTAX ERROR
1LIST

10  HGR : POKE -16302,0
20  FOR W = 0 TO 200 STEP 9
25   C = RND (1) * 7
30   X = 30 + W
35  FOR Z = 0 TO 150 STEP 7
40   Y = 13 + Z
45  GOSUB 2000
50   B = 48:H = 24
55  GOSUB 2000
60   B = 24:H = 12
65  GOSUB 2000
70   B = 12:H = 24
75  GOSUB 2000
78 NEXT Z: NEXT W
80  GOTO 20
999  END
2000  HCOLOR= C:I = B / 2:J = H / 2
2005  HPILOT X,Y - J TO X + I,Y TO X,Y + J TO X - I,Y TO X,Y - J
2010  RETURN
?SYNTAX ERROR
JLIST

10 HGR = POKE -16302,0
20 FOR X = 0 TO 210 STEP 20
30 FOR Y = 0 TO 140 STEP 20
40 HCOLOR= 7 * RND (1):B = 70:H
      = 20
45 H = RND (1) * 20
46 B = RND (1) * 70
50 HPLOT X,Y TO X+B,Y TO X+B
     ,Y+H TO X,Y+H TO X,Y
60 NEXT Y
70 NEXT X
75 GOTO 20
80 END
?SYNTAX ERROR

10 HGR : POKE -16302,0
12 X = 140:Y = 80
20 FOR B = 10 TO 278 STEP 78
25 C = RND (1) * 7
35 FOR H = 5 TO 158 STEP 58
40 GOSUB 2000
46 NEXT H: NEXT B
50 B = 8:H = 4:C = 6
55 GOSUB 2000
60 B = 4:H = 2:C = 6
65 GOTO 20
70 B = 2:H = 4:C = 6
75 GOTO 20
80 END
2000 HCOLOR= C:I = B / 2:J = H / 2
2005 HPLOT X,Y - J TO X + I,Y TO X,Y + J TO X - I,Y TO X,Y - J
2010 RETURN