1985

How the computer can aid and facilitate traditional graphic design process, procedure, methodology, and curriculum development: A Videotape presentation

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ROCHESTER INSTITUTE OF TECHNOLOGY

A Thesis Submitted to the Faculty of

The College of Fine and Applied Arts

in Candidacy for the Degree of

MASTER OF FINE ARTS

How The Computer Can Aid and Facilitate Traditional Graphic Design Process, Procedure, Methodology, and Curriculum Development.

A Videotape Presentation

by

Mary Jane Lewandowski

May 9, 1985

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ACKNOWLEDGEMENTS

I would like to extend my deepest gratitude to Professor R. Roger Remington. He has helped me throughout the development and execution of this educational tool "How the Computer Can Aid and Facilitate Traditional Graphic Design Process, Procedure, Methodology, and Curriculum Development."

A special thanks should go to Professor Heinz Klinkon and Professor James Ver Hague for their individual roles in evaluation and implementation. Thank you to Ruth Leavitt who initially introduced me to computer graphics.

I would like to acknowledge my family and Joan Dowling for their support, especially through the difficult moments, and all the other people not specifically mentioned who have aided in my progress.

Mary Jane Lewandowski

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CHAPTER I

PURPOSE

The purpose of this thesis was to develop an educational tool that would deal with the relationship Computer Graphics has with Graphic Design. This grew out of the direct integration of computer graphics into the graduate graphic design program at Rochester Institute of Technology and the growing interest of computer graphics in the consumer world.

The computer is becoming increasingly involved in everyday existence at all levels, from engineering to entertainment, to playing a video game. This swiftly growing expansion of computers into society has made many people nervous and resistive. I observed college students who were forced to use computers for the first time become afraid and quickly frustrated, forming a negative opinion of an interface into their lifestyle. The label "Beeper Head" was given to those interested in an interface with the computer.

Evidence of computer graphics in society was very slick and impressive in the form of motion picture films and television commercials. This first encounter left high expectations as to what could be achieved on a computer.

When the limitations of these specific machines were discovered, and the realization that a major film could not be accomplished in the first two weeks of orientation with the system, they felt some

frustration. They lost sight of the possibilities of the individual system and how it could be another tool and aid the designer within its own capabilities.

This educational tool is directed to students and design professionals that have minimal or no experience with computer graphics.

I hope to get them excited about computers and show them the possibilities the interrelationship computer graphics has with traditional graphic design on various levels.

I am not proposing an exchange of T-square, triangle, drafting table, rapidograph, for keyboard, disk drive, CRT, and floppy disk, but the intermingling of all of the above. I would like to see the designer use the computer as an aid, not a replacement to traditional board designing. The designer can manipulate a combination of tools for the best possible result which solves the particular problem in the most efficient means.

Capabilities of different computer systems are shown, with emphasis on the Genigraphics. The application of these as an aid to traditional graphic design process, procedure, methodology, and curriculum development are demonstrated.

PROBLEM ACCEPTANCE

> In the jargon of computer science, the process of starting at the root of the tree, followed by progressive definition of more detailed levels, is known as 'top-down' structured programming. The process of back tracking and redefinition until a satisfactory design is found is known as 'step wise refinement' of an algorithm.
>
> Kenneth L. Bowles
> Problem Solving Using Pascal, Springer-Verlag, 1977.

Graphic Designers and Computer Scientists are problem solvers and have fundamental similarities in their approach to a problem. Throughout my studies I have participated and seen problem solving in action. A design process is employed to develop a solution.

The visual Semiotic process was introduced to me as a graduate student. Semiotics is a method of analyzing a problem. This analysis is broken down into three major components, syntax, semantics, and progmatics. During my first quarter course work with Professors R. Roger Remington and James Ver Hague, Semiotics was used as a method and the computer as a tool to develop symbols for the three faces of the computer as described by Aaron Marcus. While researching more about Semiotics and the three faces of the computer, their similarities were realized for the first time. There was a direct correlation between the three levels of each. Syntax could consist of programming

code, the innermost level or basic design elements, referred to as the innerface of the computer system. The semantic messages that are conveyed are evaluated through interaction with the user, the interface. Pragmatics is the third consideration which the Semiotic system employs. This is the end product and the practical aspect. It deals with effectiveness and efficiency. This phase is called outerface.

I was interested in computer science and programming. I began to take the courses in The College of Applied Science and Technology. Computer scientists were writing code to solve problems, to get a specific end result. While learning to write code, a feedback system of checking and rechecking was involved. This method had a direct relationship to how a graphic designer was solving visual communication problems. Ultimately, the same process was being used to achieve different end results.

Realizing these similarities at the elementary level, it was felt that others who had a difficulty dealing with computers and the arts should be made aware of the advantages of their unity. Computers and applied arts were not as opposite as one might think when first compared. A synthesis of technology might be more easily absorbed into visually creative aspects of society.

I began a personal involvement, trying to ease the merger of graphic design and computer graphics.

PROBLEM ANALYSIS

> The same is true today, only more so, because of the enormous creative possibilities that the new communications technologies offer the aspiring graphic designer. Everywhere you look, you see new ways to do things, new methods of solving problems-computer graphics, digitized typography, color scanners, and so forth. All of these technical developments make possible finer-quality results, with less labor and expense than ever before. This is indeed a time for learning.
> ... It has been said that by the year 2000, the largest industry in the United States will be the communications industry that we as graphic designers will be part of. It is now being created by scientists and engineers. It will remain to be shaped by artists and graphic designers. Technology cries out for art.
>
> Aaron Burns, President International Typeface Corporation, Preface in Graphic Design Career Guide, by James Craig, Watson-Guptill, 1983.

In September of 1983 I officially began my thesis work. The previous summer I was the graduate assistant for R. Roger Remington. Teaching the graphic design class two days a week was a part of my responsibilities. This experience got me interested in the education process and curriculum development. In August of 1983, I was offered a part-time position at Daemen College in Amherst, New York to teach sophomore graphic design. This position was accepted which added a whole new dimension to my work. At that point, I decided to spread

my thesis over the year. I took on many responsibilities at one time, the part-time teaching position at Daemen, a full-time graduate assistant at RIT, and breaking ground on my thesis. All of these interests were interwoven in my studies. I began to investigate:

- the areas computers were currently being used
- the traditional graphic design process
- computer graphics
- computer science
- education in school systems
- graphic design curriculums
- computer literacy programs
- computers in elementary and secondary school systems

Common elements to problem solving approaches in the different disciplines were looked for. This investigation was also directed toward curriculum development and how the computer could be a tool to the graphic designer. The capabilities of different systems were looked at to see if they had any application to graphic design.

This research involved exploring special topic books, periodicals, educational policies, activities of special interest groups, encyclopedias, dictionaries, thesauruses, and interviews with students and practitioners knowledgeable in the specific areas. A few people with which I had contact were Professor Dr. Mihai Nadin, Ruth Leavitt, Maryann Begland, Anthony Rozak, Patricia Cole, Aaron Marcus, Duane M. Palyka, Professor John Solourski, and Professor Robert Keough.

Notebooks with collections of articles, quotes, work examples, and diagrams of information pertinent to my investigation were kept. These notebooks were used as a resource for writing this document. Various segments have been extracted from my collection and inserted into several sections and appendices.

These findings were also a basis for the images generated on different computer systems and images selected to be used in the video presentation.

PROBLEM DEFINITION

My audience was defined as professionals and students in graphic design who have little or no experience with computer graphics. There were several specific areas of computer graphics that could have been chosen and pursued in detail. With the wide range of computer applications available and a novice audience, it was necessary to touch on the various aspects briefly. This tape was to be an introduction to this relatively new technology applied to graphic design.

This information was presented in simplistic terms which would allow an understanding of computer jargon. Visually interesting images were provided to support the concept presented and maintain audience attention. A combination of images I generated as well as those already existing in the field by practitioners were chosen. This showed a variety of applications from the different areas of print, film, commercials, animation, educational, functional and experimental computer graphics.

Each title slide generated was based on the same grid which was created on the Genigraphics computer. This standardization and a color consistency provided an overall unity to the presentation.

The following rough guideline defines the areas covered in the video presentation.

Topic Guideline

Process - a series of actions, changes, or functions that bring about an end result; a system of operation in the production of something.

Compare similarities in:

DESIGN PROCESS and	COMPUTER PROGRAMMING
Graphic Design Career Guide	Introduction to Computer Science
Universal Traveler	Oh Pascal
Design Concepts and Applications	Problem Solving Using Pascal
Principles of Two Dimensional Design	Basic - An Intro To Computer Programming
steps	algorithm
decisions	flow chart example
repetitive actions	program design process
tasks	loops

An integral part of the design process is not separate but linked together.

Apply to Semiotics:

- interaction between three dimensions to create a design
- three faces of the computer
- check and recheck
- similar to program with loops

Because process is similar:

- computer can store information and repeat the loops asking questions
- aid to design process if had a Semiotics software program especially for student designer use

Curriculum Development - all courses of study offered by an educational institution; a particular course of study often in a special field.

- coming into existence

- other ways students entering design could use the computer as an aid
- curriculum exercises
    - grid studies
        - checkerboard
        - patternistic
        - textural
        - constructional
        - modular
        - typographic unit
    - letterform F study
    - motion inward and outward
    - interval study with color
    - object translation
    - color studies
    - Gestalt Principles

Procedure - a course of action

aid to designer procedure
speed
different way of going about
replace copy
typesetting
animation
creation of images
time saver

Methodology - the principles or practices of orderly thought; procedure applied to orderly thought; method - a regular systematic or orderly way of doing anything.

- aid the method designers take
- preliminary work designer does is first done on computer then tightened on board
- digitize information then manipulate
- 3D signage, simulations able to rotate
- logo or symbol development, able to change angle or slant
- patterns
- repetition of element or object
- to cut down on remedial tasks
- transformations
- create a basis for experimentation
- page layout, grid

Finished Work:

- business graphics
- symbol development
- typesetting, right on screen
- animation, key frames
- illustrations
- electronic publishing
- data processing
- storage

Computer images could be sent out on disk to be directly output onto slide form. This produced a high-quality generation of the original work on the CRT. The visual presentation was a two-projector dissolve slide show with audio, which was then transferred to 3/4 inch video tape.

A video tape format was chosen for the end result specifically with RIT in mind. There is currently a video tape collection in the Department of Graphic Design which is used for educational instruction. Students have access to this collection and there is viewing equipment conveniently located in the library. A video format is compact and easy to store. It maintains its presentation quality because it is a set format that cannot be tampered with. It is a simple task to show a video with minimal preparation. It is possible to copyright information on a video tape. As technology evolves, video cassette equipment is commonly found in a wider range of institutions and studios.

CHAPTER II

IMPLEMENTATION

After setting my guidelines, I began using different computer systems and software to explore how the computer could be an aid to the designer.

Work was done on the Apple IIe, a personal computer, the Vax with a GIGI keyboard, a time sharing system, and the Genigraphics. A video camera, various printers, a plotter, graphics tablets, a stylus, joysticks, paddles, and keyboard input were used.

Time comparisons were kept between images generated on a computer and producing the same work using traditional graphic design board methods. These images generated were geared to support my thesis statement and have a direct relationship to the topics covered in the guideline.

Preliminary slides of my work were taken directly off the computer screen for documentation and evaluation purposes. It was necessary at this point for hard copy output because of the limited accessibility of the computer room. It was necessary to get feed-back from my advisors. Advisory meeting times did not correspond with computer availability. Slides were made from the computer graphic images collected from different sources at (IMS) Instructional Media Services.

It was now time to pull all this information together into a cohesive whole through the writing of the script. This script was going to be the audio narration for the slide show. There were two major revisions of the script which were reviewed by members of my thesis committee. Copies were distributed to people in many areas to test for clarity and interest. This test group had a wide range of experience with computers, from none or little, to actual practitioners. The cross section of readers encompassed fields as graphic design, medical illustration, deaf education, interpreting, nursing, secretarial, computer science, computer graphics, and education. They were a combination of students, faculty, staff, and professionals.

A story board was then created to match images with the topics covered in the script. I now knew where there were holes to fill and went back to expand upon or delete sections. A test recording was made, reading the script myself on cassette tape. This helped me figure out pacing and pulsing of the slides.

My script was marked with slashes to indicate a slide dissolve. Each slash was numbered to correspond with the slide number. This was a benefit to me because two slide projectors were used and all the odd numbers were to be in tray #1, and all even numbers in tray #2. If at some point a dissolve was out of sequence, the number, the tray, and the script line were known. Attention could immediately be directed to the problem area. This became especially valuable when using the Micro-Dot dissolve unit during production.

The audio portion of the presentation was recorded by David Stone, IMS audio engineer. He provided narration voice samples from which the appropriate narrator could be chosen. A male voice with an expressive excitement in his tone was chosen. Then appropriate background music to accompany the narration was added.

The revised story board was produced to refine sequencing and transitions. An environment was simulated similar to the TV studio to practice running through the presentation. Two slide projectors were set up with all images intact. The variables that would differ were my use of a Kodak dissolve unit and a cassette audio tape verses the Micro-Dot dissolve unit and a reel-to-reel audio tape.

I was aiming for a 15-minute presentation. This was a recommended time to hold audience interest and generate excitement on the topic. The final version has a viewing time of 14 minutes, 43 seconds.

Appendix entries contain samples of the computer graphics in this presentation.

NARRATION SCRIPT

Narrator: Neil Fagenbaum
Audio Engineer: David Stone

VIDEOTAPE PRODUCTION

Production Crew: Steven Wunrow
Paul Graziano
David Cronister

Viewing Time: 14 minutes, 43 seconds

THESIS STATEMENT

How The Computer Can Aid and Facilitate Traditional Graphic Design Process, Procedure, Methodology, and Curriculum Development.

THESIS SCRIPT

Graphic designers and computer scientists are problem solvers and have fundamental similarities in their approach to a problem. First let us compare the similarities of the design process and computer science. In both, one analyzes and designs. A structure or path is followed leading to an end result. In this end result, there is a feedback system of analyzing and checking. This is a method of evaluation. The Semiotic process is a similar checking procedure. Semiotics can be applied to computers and graphic design. This evaluation method consists of: syntax, semantics, and pragmatics. The syntax could either consist of programming code, the inner most level, or basic design elements - referred to as the innerface of the computer system. The semantic messages that are conveyed are evaluated through interaction with the user - the interface. Pragmatics is the third consideration which the semiotic system employs. This is the end product and the practical aspect. Does it solve the problem effectively and efficiently? This phase is called the outerface. The interaction among these three dimensions of Semiotics is used in the creation of design. The overall process is similar to a conditional looping structure in computer science. If the condition is met, then the action is taken. The merging of these procedural skills and the hardware of

the computer lead to computer graphics. Let us discuss some of a computer's features and how they can aid the graphic designer. Menu terminology is specific to the individual computer system being worked on, with the use of Genigraphics as a typical computer graphics system. Input and output vary on different computer systems. Common input devices are penlike styluses, joysticks and graphics tablets. Depending on the hardware used, output can be in slide form, hard copy printouts, transparencies or computer driven plots. Storage is a favorable aspect of designing with the computer. Images can be stored compactly on magnetic floppy disks, or directly within the computer system itself. These images can vary from preliminary sketches - to variations in finished artwork. This eliminates the bulk storage problem of boards and mechanicals. A very important tool to the designer is the grid. The computer has a built-in unit grid format. This grid format is related to the resolution. The resolution is defined as the number of units across and down the screen. Resolution determines the quality of the image, the higher the number the finer degree of detail available. A compositional grid, consisting of modules of equal units square, can already be defined by a grid option on many computers. By selecting on grid, any size module can be created through a stepping motion from unit to unit. A point is only placed on vertices. The individual grid format created can be used as the skeletal structure for layouts, indicating copy and photos. Another organizational method is the constructional grid. In this exercise there is a natural use of each object's reference rectangle,

a linear square outline of the outer most edges of the object. Scaling and aligning with these references makes proportional relationships of the parts easily integrated. The following design problem involves a patternistic grid. In this example the letterform 'C' is transformed into a 'G'. The methodology, which is the principles and practices of orderly thought, depicted in the way, means, or manner of proceeding, is somewhat altered when using the computer. The graphic designer still begins with conceptualizing on the board, pushing the sketches to a point with studies of different concepts and alternatives. Once a direction is established the work is transformed to the computer system, with proportional grid structures and alignments. Exact modular units and dimensions are achieved using the scaling option on the computer. The ability to move and adjust objects within these units is an easy task. The manner of proceeding on the computer has different considerations than traditional board design. Overlay becomes a major factor because the order in which objects are created is the order in which they appear on the screen. To maintain grid borders and edge relationships, the adjustment of overlay is critical to this design. If an object is not in the correct creation order, it will not maintain grid boundaries and parts that are expected to be hidden will show.

Let us look at ways in which the computer can be a aid in solving a particular design problem and can be an asset in an educational setting. The student can concentrate on design principles and visual/aesthetic design considerations, and not dwell on the mechanics involved in the execution. Several of the following examples are a

direct reference to an academic curriculum. In this case the design process is aided by the computer in the development on an interpretation of a screw, a visual translation exercise. A process involves continuous actions that bring upon a particular result. This series first begins on the board, examining different screw sizes and shapes. These are converted to the computer's inherent grid format. These shapes are then put on the computer as individual objects. The repetition of elements, equal spacing between them, and a matching of equal height and width of objects is easily created by options in the computer's menu. The manipulation of these individual objects is simplified through linking object and color. When objects are linked together and an action is imposed upon one, all objects linked are affected. Therefore, variations in line thickness, line length, positive and negative reversals, solid shapes, and linear versions can be seen in minutes. Once the basic shape is decided upon, the designer is able to create eight variations on the computer in the time it takes to manually create one on board. The investigation which the computer allows the designer to undertake is more extensive and allows more variations in the same amount of time, while still maintaining precision. Any one of these variations on the computer can be chosen as the finished result. In the traditional design method, the chosen rough would then be transferred to board for final drafting, which is a time consuming activity.

A frequently used option is color. It can be added to differentiate sections of objects to be studied. With the assistance of the computer,

academic experiments with the change of value, hue, and chroma as well as manipulation of the background color, can be a quick and simple task. The addition of color into basic interval studies gives the student more options in the creation of depth. The ease in which color can be changed is an asset to the graphic designer. In these examples, the color variation behind the telephone illustrations and in the typography can be seen in minutes. A black and white sketch can have a new feeling when color is added. Computer typesetting allows the manipulation of typography in ways not easily achieved manually, as shown in these examples of the application of typography to imagery, or type as the design element.

Programming patterns with type as the subject can provide interesting results. Word processing is another aspect of computer capabilities. An application of typography can be seen in business graphics. Information business graphics is an important function of the computer system. Statistical information can be graphically represented with precision. Information can be color coded for ease in recognition. A business can set a format according to the specified information. This format can then be followed, and by using the replace copy option, title slides can be quickly generated. Replacing copy is also useful for layout additions or revisions. The duplication of an object can be the beginning of a manipulation process. Throughout this manipulation, options such as sizing, scaling, and color can also be used to enhance the design. In this exercise an interval problem takes on a new dimension with the use of a letterform. This is duplicated and manipulated to create a bellowing effect. Duplication combined with

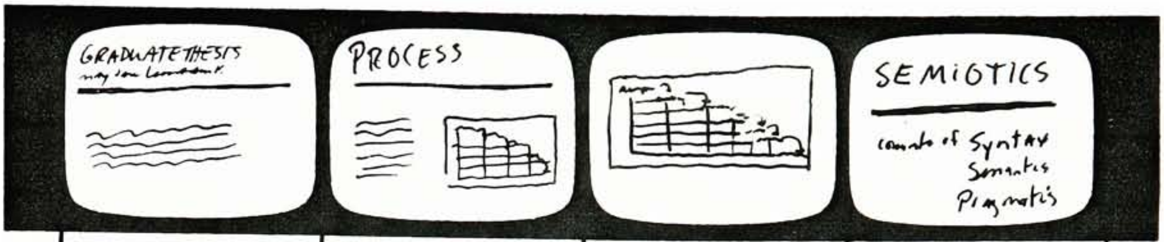
the move and grow option is very useful in the following curriculum application of the study of a letterform. The characteristics of this 'F' are examined. By moving and growing the individual strokes in different combinations, the physical structure can be pushed to extremes, sometimes unrecognizable as the letterform 'F'. Once again many variations can be generated in minutes allowing concentration on the aesthetic problem at hand and not time consuming rendering of each letter. Alignment is a feature that can obviously be used with the alignment of typography or objects. In the following example the use of alignment is less obvious. Origin points, the points from which all manipulation of an object are based upon, are altered and then aligned to create positive and negative space relationships. In addition to maintaining a hint if the original depth, a reference to architectural form has been acquired. Because of this irregular alignment, the overlay relationships involved would have been more difficult to plan manually. If a detail of an area is desired, it is possible to frame-in on a section of the design. Fine adjustments can be executed in the enlargement. This can allow the manipulation of verticies or the cropping of an area to any size. Framing-in is especially useful in sketching. With the sketch option, objects can be drawn on the system and manipulated. A range from a simple posterized effect to a complex detailed rendering can be among the variations drawn. Images can also be scanned in with a video camera and then manipulated. Perspective on the computer system can be used to simulate three dimensional space on a two dimensional surface plane.

Some computer systems have three dimensional space capabilities with the use of axes, and inputting corresponding coordinates. Planes created can intersect in space forming shapes and objects. Input into three dimensional space can aid the designer in seeing various views of the object through: rotation of the object, altering the distance the viewer is from the object, and changing the viewer's eye level. This is particularly useful in industrial and scientific applications. Graphic designers often incorporate visual translations in their work. Translations of letterforms, objects, and space can be generated on the computer. Translations used in the simulation of space can aid in architectural and environmental planning. Object translations can have various functions from identity programs, and poster applications to book illustrations. Computers are rapidly entering the field of animation. The computer can aid traditional cell animation. The designer specifies key frames of action, and the computer fills in the stages in between. The number of frames in which the transition takes place is the designer's decision. Computer animation can be seen in various applications, ranging from TV sequences, commercials, film production and movies, to experimental and educational investigations.

While using the computer in many cases, unpredictable results happen. Sometimes these are happy accidents and are expanded upon. Situations can be intentionally set up. A controlled randomness can lead to unimagined possibilities.

When reviewing all the options covered, the highlighting element which makes the computer an effective tool is its time saving factor. After a familiarization with the system, the time saved in designing on the computer can be abundant with such features as color change, duplication, move and grow, replace copy, typesetting, animation, and of course, the grid.

You can bet, today's designer hit the jackpot with the development of a new tool that can aid in one's process, procedure, methodology, and educational development.



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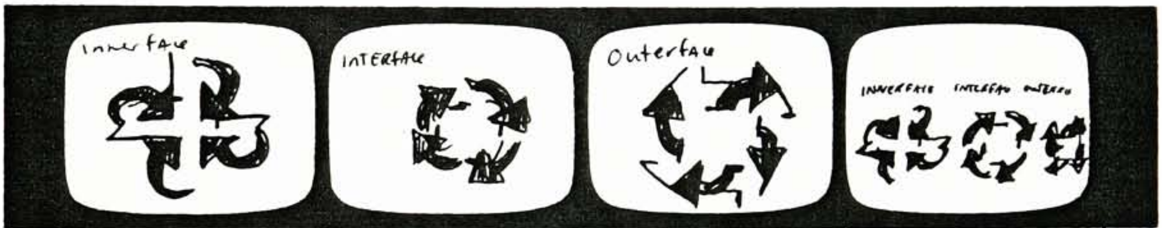

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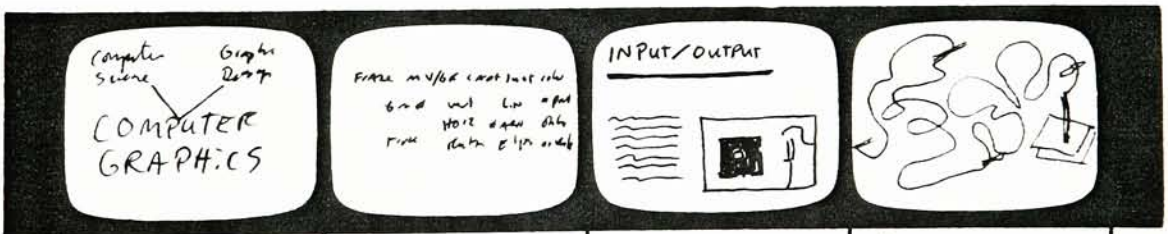

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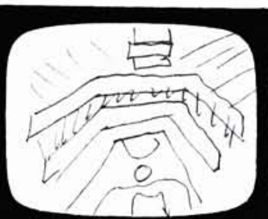

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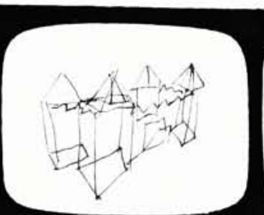
Depending on the hard ware used, output can be in slide form



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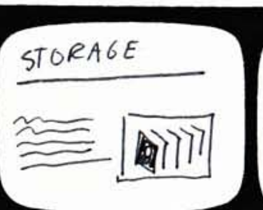
hard copy printouts, transparencies or computer driven plots.



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Storage is a favorable aspect of designing with the computer. Images can be stored compactly on magnetic

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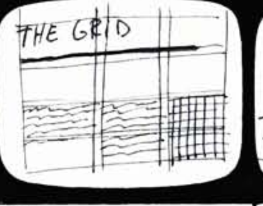

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A very important tool to the designer is the grid. ... units across and down the screen.

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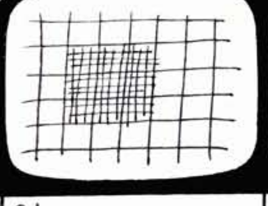

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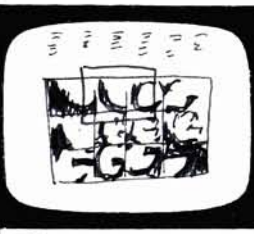

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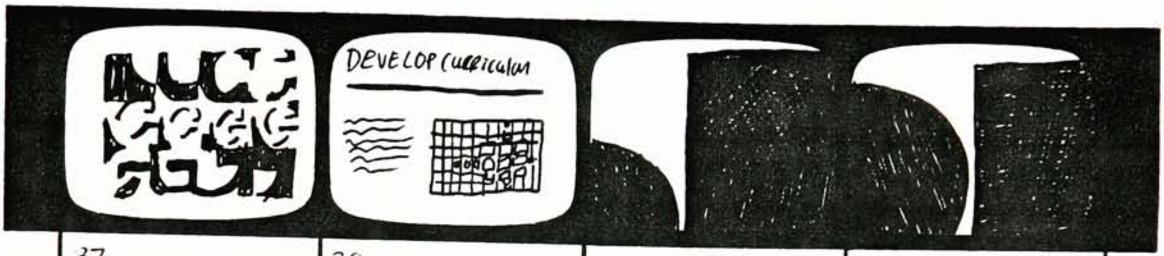
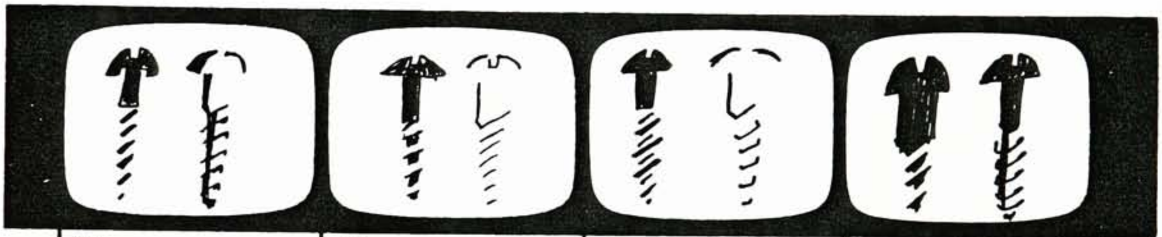
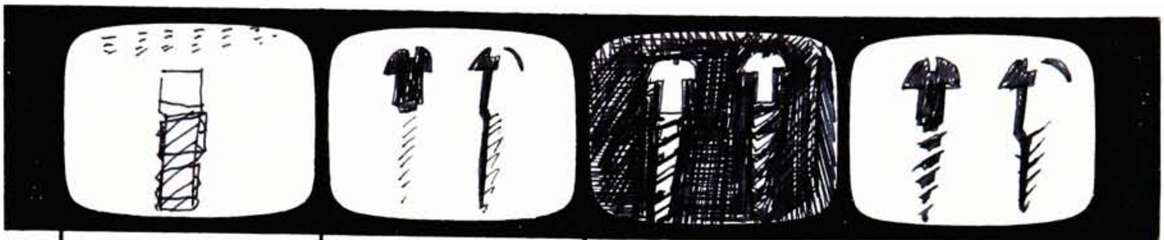


37	38	39	40
that are expected to be hidden, will show.	Let us look at ways in which ... in an educational seting. the student can	concentrate on design principles and visual ... dwell on the mechanics	involved in the execution. ... reference to an academic curriculum.

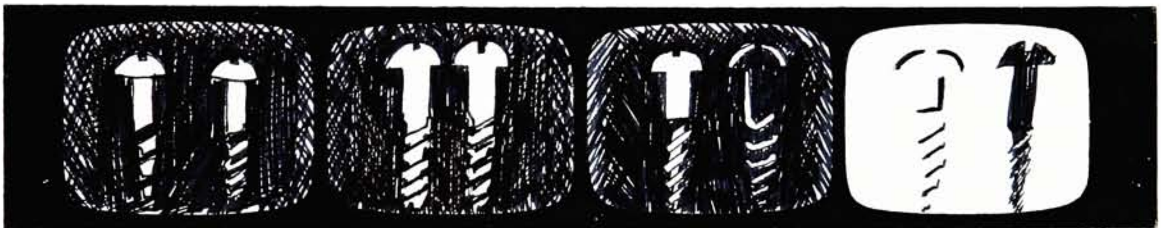


41	42	43	44
In this case the design process ... development of an interpretation	of a screw, a visual translation exercise. A process involves continuous	actions that bring upon a particular result. this series first begins	On the board, examining different screw sizes and shapes. these are

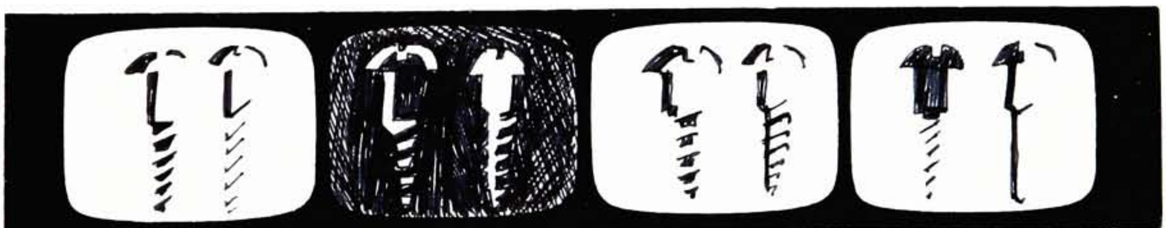
45	46	47	48
converted to the computer's inherent grid format. these shapes are then put	on the computer as individual objects. the repetition of elements,	equal spacing between them and a matching of equal height and width of objects	is easily created by options in the computer's menu.



49	50	51	52
the manipulation of these individual objects is simplified through	linking object and color. when objects are linked together and an action is imposed	upon one all objects linked are affected. therefore variations in line thickness	line length, positive and negative reversals solid shapes,

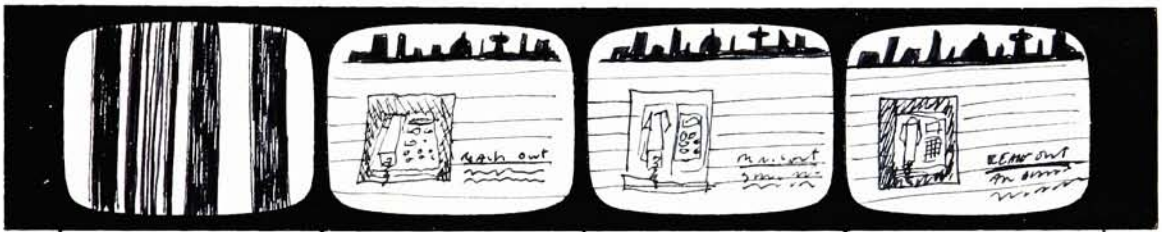


53	54	55	56
and linear versions can be seen in minutes. Once the basic shape is decided upon	the designer is able to create 8 variations on the computer in	the time it takes to manually create 1 on board. the investigation which the	computer allows the designer to under take is more extensive and allows



57	58	59	60
more variations in the same amount of time, while still maintaining precision.	Any one of these variations on the computer can be chosen as the	finished result. In the traditional design method, the chosen rough would	then be transferred to board for final drafting, ... consuming activity.

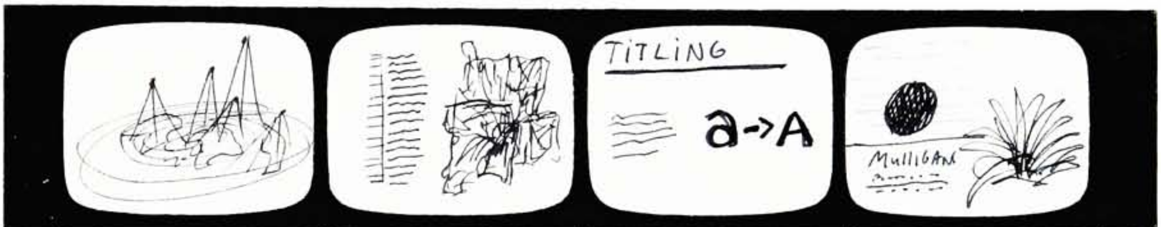
61	62	63	64
A frequently used option is color.	It can be added to differentiate section	of objects to be studied. With the assistence	of the computer, academic . . . be a quick and simple task.



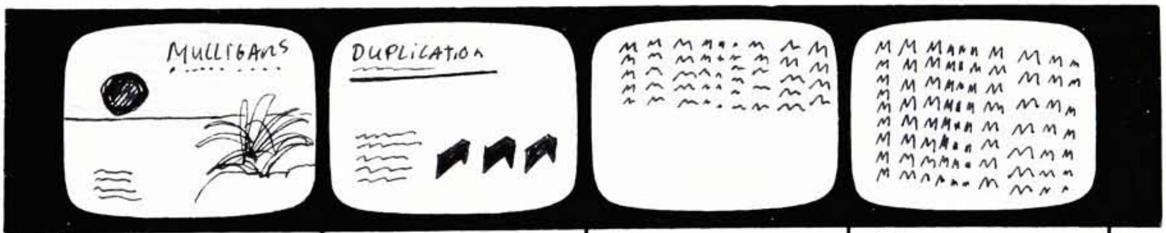
65	66	67	68
The addition of color into basic . . . student more options in the creation of depth.	The ease in which color can . . . to the graphic designer.	In these examples, the color variation behind the telephone illustrations and	in the typography can be seen in minutes.

69	70	71	72
A black and white sketch can have a	new feeling when color is added.	Computer typesetting allows the . . . achieved manually.	As shown in these examples of the application of typography to imagery

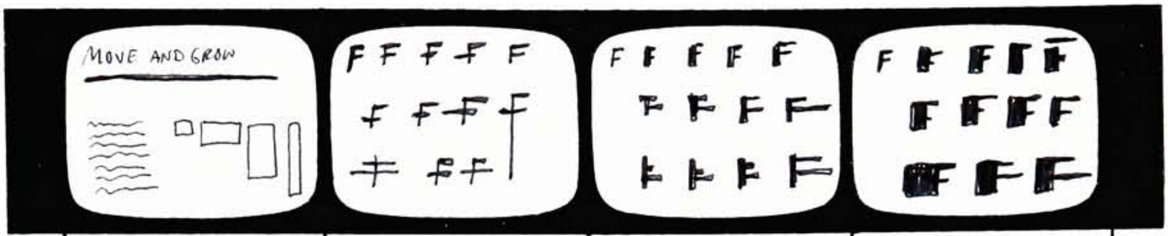
73	74	75	76
or type as the design element.	Programming patterns with type as the subject can provide interesting results	Word processing is another aspect of computer capabilities. An application	of typography can be seen... function of the computer system.



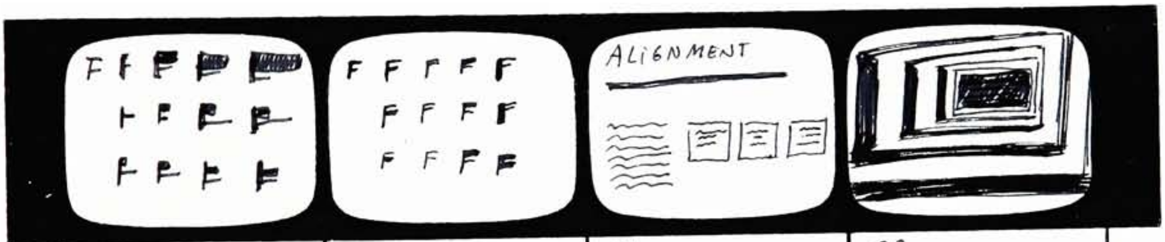
77	78	79	80
statistical information can be ... be color coded for	ease in recognition. A business can set ... this format can then be followed,	and by using the replace copy option, title slides can be quickly generated.	Replacing copy is also



81	82	83	84
useful for layout additions or revisions.	The duplication of an object can be... options such as sizing.	scaling, and color can also be used to enhance the design.	In this exercise an interval problem ... manipulated to create a bellowing effect.



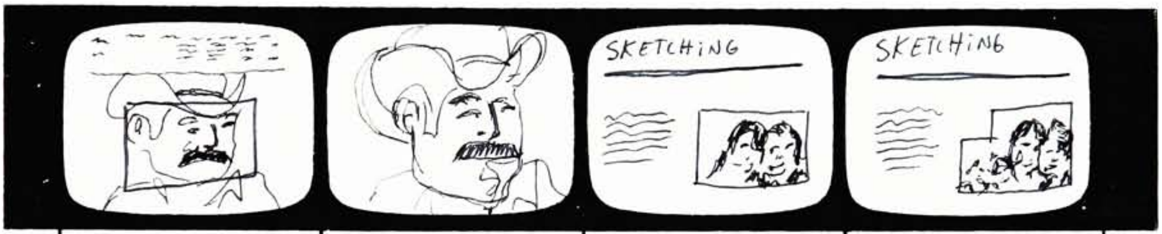
85	86	87	88
Duplication combined with the ... curriculum application of the study of a letterform.	The characteristics of this letter 'F' are examined. By moving	and growing the individual strokes in different combinations,	The physical structure can be pushed to extremes, sometimes unrecognizable as the letter form 'F'.



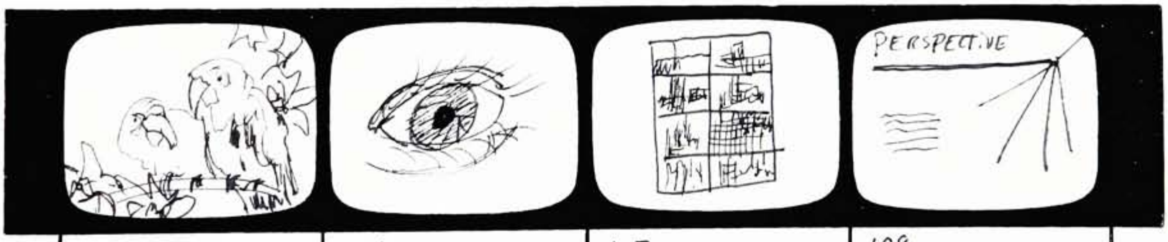
89	90	91	92
Once again many variations can be generated in minutes allowing	Concentration on the aesthetic problem at hand and not time consuming rendering of each letter.	Alignment is a feature that can ... In the following	example the use of alignment is less obvious.

93	94	95	96
Origin points, the points from which all	manipulation of an object are based upon, are altered	and then aligned to create positive and negative space relationships.	In addition to maintaining a hint of the original depth,

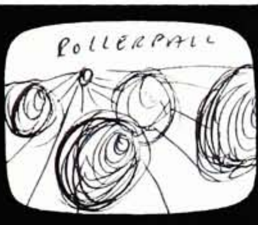
97	98	99	100
a reference to Architectural form has been acquired.	Because of this irregular alignment, the overlay relationships	involved would have been more difficult to plan manually.	If a detail of an area is desired, it is possible to frame-in on a section of

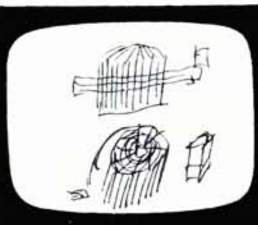


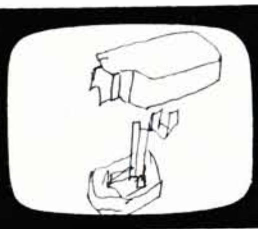
101	102	103	104
the design. Fine adjustments can be executed in the enlargement. This can allow the	manipulation of verticies or the cropping of an area to any size. Framing-in is especially	useful in sketching. With the sketch option,	objects can be drawn on the system and manipulated. A range



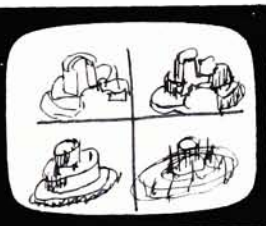
105	106	107	108
from a simple posterized effect	to a complex detailed rendering can be among the variations drawn.	Images can also be scanned in with a video camera and then manipulated.	Perspective on the computer system can be used to simulate three dimensional space

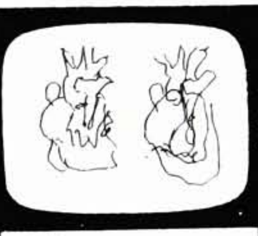


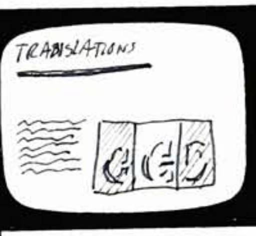


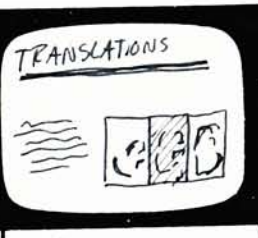


109	110	111	112
on a two dimensional surface plane. Some computer systems have three dimensional space	capabilities with the use of axes, and inputting corresponding coordinates planes created can intersect in space	forming shapes and objects. Input into three dimensional space can aid the designer in seeing	various views of the object through: rotation of the object



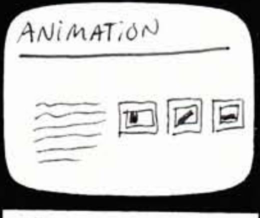






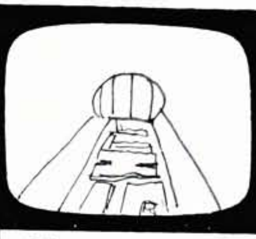
113	114	115	116
Altering the distance the viewer is from the object, and changing the viewer's eye level.	This is particularly useful in industrial and scientific applications.	Graphic designers often incorporate visual translations	in their work

117	118	119	120
Translations of letterforms, objects, and space can be generated	on the computer. ... Aid in Architectural and environmental planning.	Object translations can have various functions from identity programs,	and poster applications to book illustrations.



121

Computers are rapidly entering the field of animation.



122

The computer can aid traditional cel animation

123

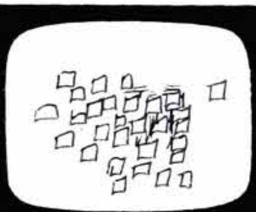
The designer specifies key frames

124

of action, and the computer

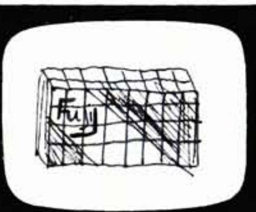
125

fills in the stages in between.



126

The number of frames in which the transition takes

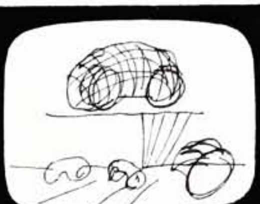


127

place is the designer's decision. Computer animation can be seen in various applications,

128

ranging from TV sequences, commercials,

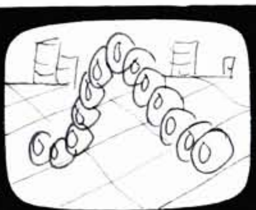


129

film production and

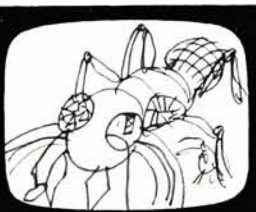
130

movies



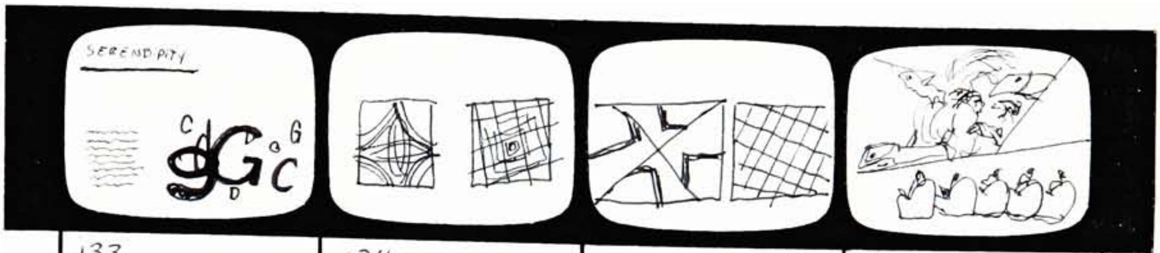
131

to experimental and

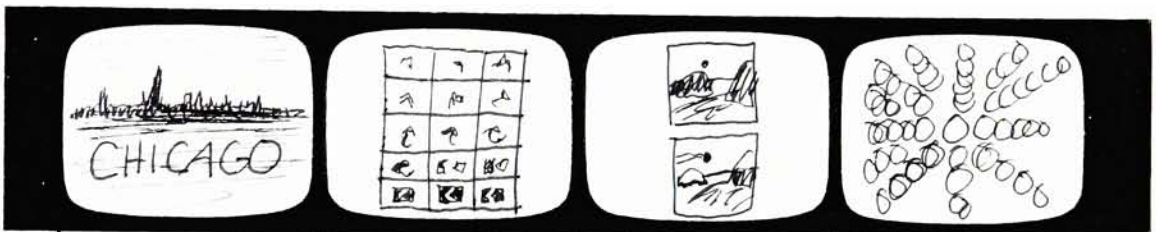


132

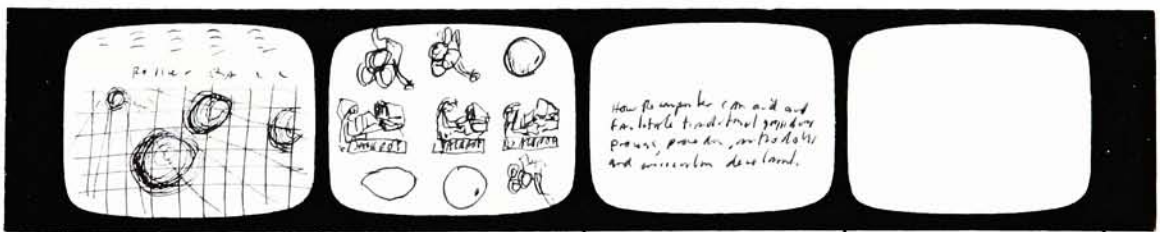
educational investigations.



133	134	135	136
while using the computer in many cases, unpredictable ... and are expanded upon.	Situations can be intentionally set up.	A controlled randomness can lead to unimagined possibilities.	When reviewing all the options covered, the highlighting element which makes the computer



137	138	139	140
an effective tool is its' time saving factor.	After a familiarization with the system, the	time saved in designing on the computer can be abundant with such features as color change,	duplication, move and grow, replace copy,



141	142	143	
typesetting, animation, and, of course, the grid.	You can bet, today's designer hit the jackpot with the development of a new tool that can	aid in one's process, procedure, methodology, and educational development.	

REFINEMENTS

There are many unforeseen problems with the first video tape presentation made. This became a working tape upon which changes and corrections were made. Because of the time schedule at IMS, the opportunity did not exist to pulse the audio tape. I, therefore, had to hand dissolve the slides live during the transfer. It was very difficult to get used to the Micro-Dot dissolve unit. This unit was not allowed out of the IMS studio.

The color scheme chosen for my title slides did not transfer to video. Originally red headlines and white body copy on a black background were used. This proved to be illegible after transfer. The red looked like a bad black. I corrected this by using warm red-orange headlines and white body copy on a neutral gray background.

A major problem was the different densities of the slides. For graphic reasons, many images were black on white and would then reverse throughout the show. This posed an F-stop range problem. Hot spots were created on the video tape because the camera was set for one density of a slide. Often the next dissolve would be a slide in an opposite range. These 'hot spots' were slowly faded away by switching the F-stops during the shooting session. It was recommended to stay away from pure white, pure black, and switching from one to the opposite.

Slides sent to Genigraphics were shot at different exposures, therefore, they were different densities. Slides taken at IMS were instructed to be shot in TV format. The proportions of a television screen are different from those of a 35mm slide. Some of the work received from IMS were not in TV format and therefore were blocked out in the video. These had to be returned and re-shot.

This preliminary tape was shown to my advisors and several students to get a reaction. I then went back and reworked all the images necessary. Once again slides were sent to and made by Genigraphics to achieve the highest quality computer image.

Time and financial considerations proved it impossible to retape the audio section of the presentation.

During the second video taping session there were problems with slides dropping in the carousel. The heat from the projectors was making particular slides stick. In order to avoid any future problems, all of the slides had to be remounted in the same type of slide mount and remasked with aluminum tape.

A feedback system of checking and evaluating applied to every aspect of this video tape production.

CONCLUSION

Problem solving is a major purpose for graphic designers. There are many approaches to problem solving. The different techniques used are specific to the problem and the solution. The necessary tools are used for each solution. The greater the number of tools designers are able to utilize, the more variety there could be in their work. The computer is another tool. It is essential to use the proper tools in the creation process for a cost effective, efficient result. The computer can have a great effect on how a design problem is solved. Modern technology is upon us and as designers, we must utilize it to our full advantage.

Depending on the available systems, some tasks remain easier and quicker to accomplish through traditional methods of board work. I have found many limitations in the equipment used. It seemed that the more familiar I became with manipulating the system, the more frustrating it became. The limitations were recognized and there were many things that could not be yet done. Generating images on the Genigraphics system was limited to two 1½ hour time slots a week because of the number of students that needed to schedule time.

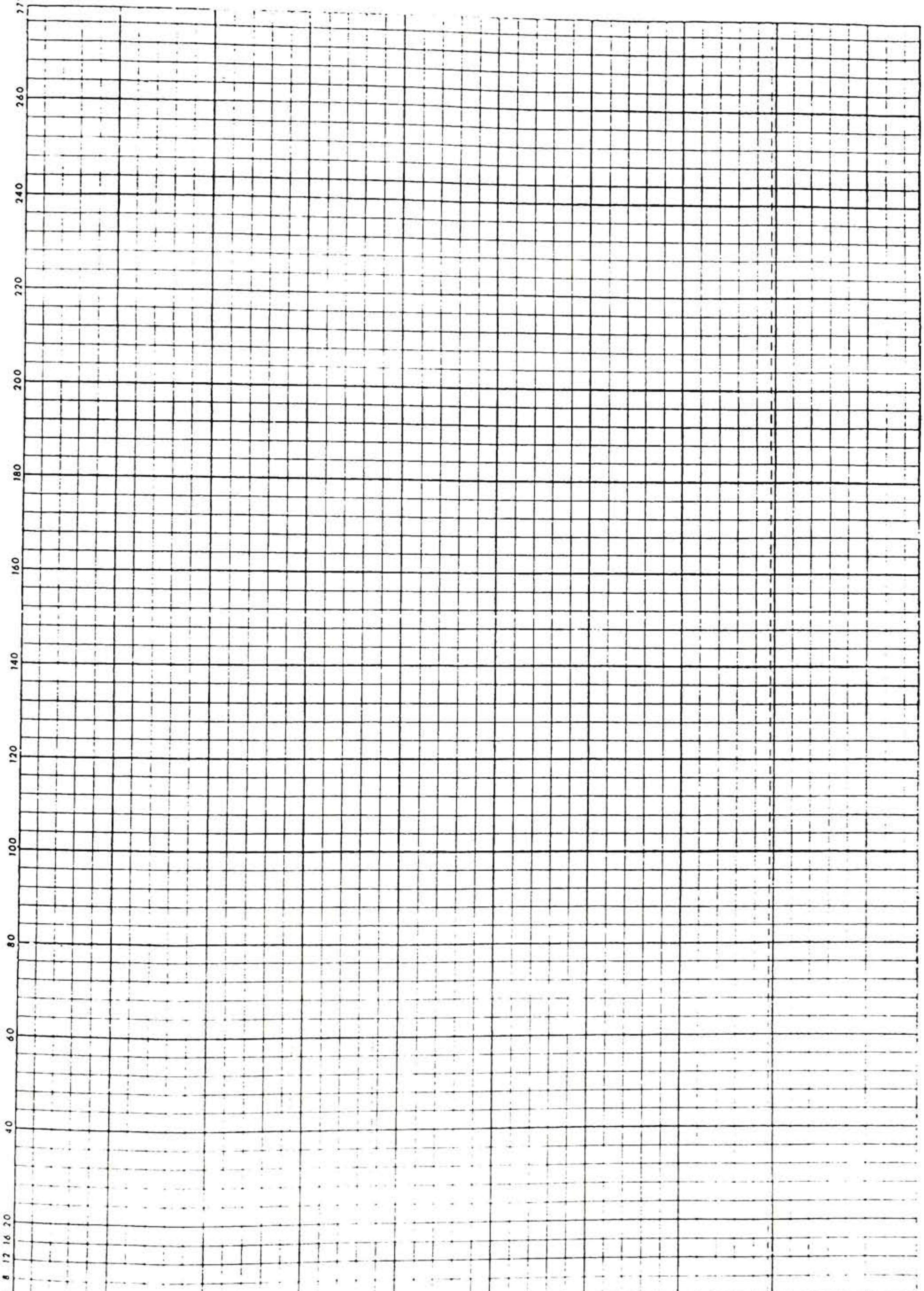
Currently the situation does not exist to incorporate computer graphics into the sophomore level design curriculum. There are a limited number of students with prior computer knowledge. This is

changing. Computer systems are being used in elementary education. It will be necessary for those currently in the field at higher levels to keep up with the rapidly advancing technology.

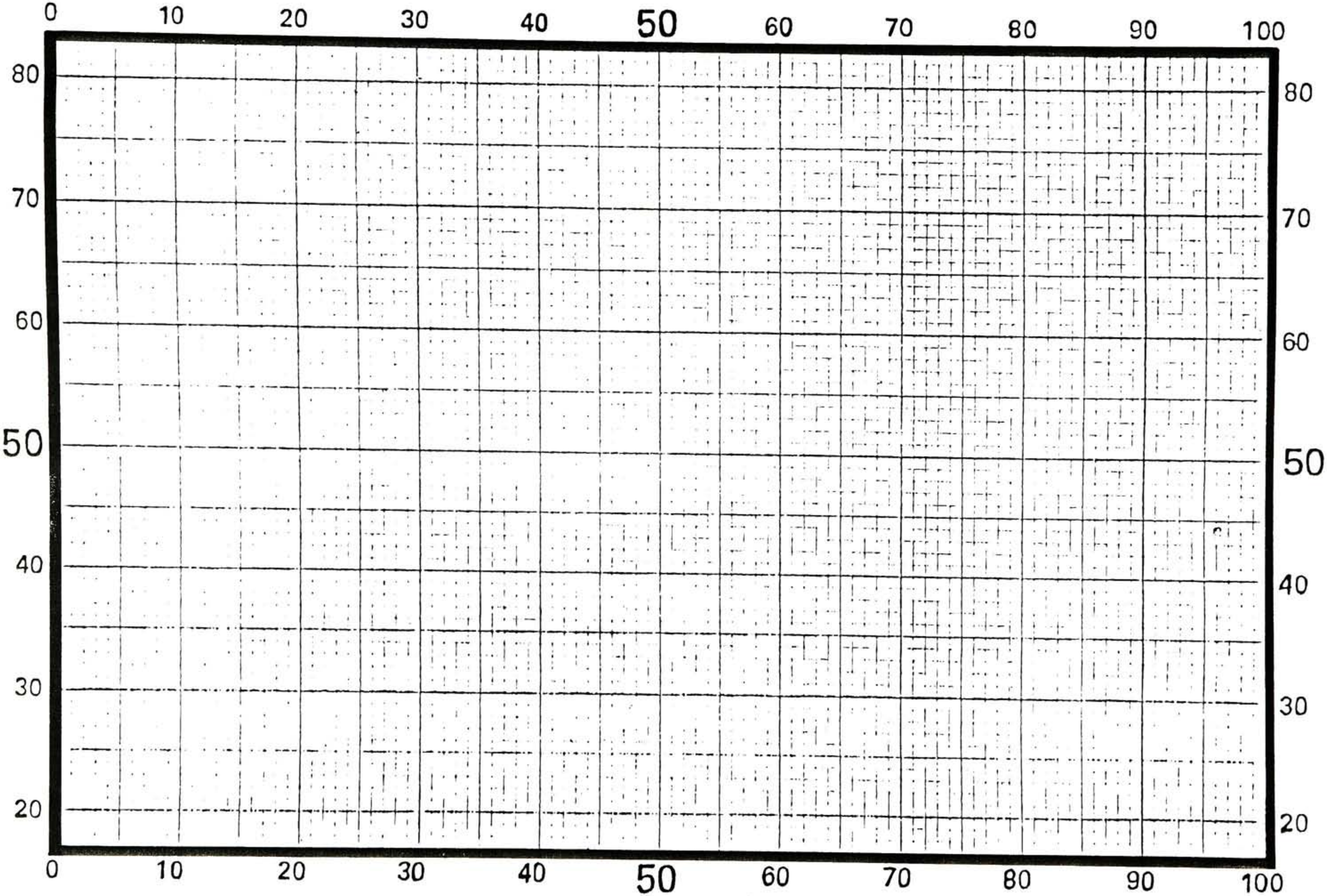
The realization must occur that computers, as a tool, are an asset to the graphic design profession.

APPENDIX A

These samples are the inherent grid formats built-in to the Apple IIe and the Genigraphics computer systems. They can be used for layout and placement purposes.

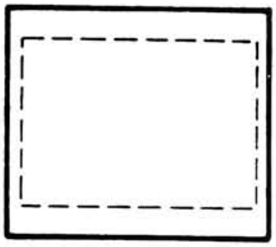

279
260
240
220
200
180
160
140
120
100
80
60
40
0 4 8 12 16 20
4 8 12 16 20 40
100 120 140 160

GENIGRAPHICS Layout Sheet 35mm Slide Format

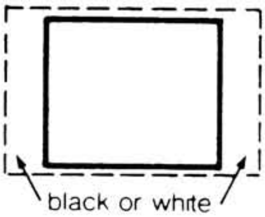


APPENDIX B

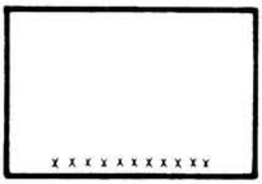
When having copy work photographed into slide form for a video presentation, it is necessary for the image to be within the TV critical area. This format is horizontal and is not proportional to a 35mm slide frame. Instructional Media Services has this slide chart printed on the back of the requisition form.



BLEED Indicates that the original extends past the borders of the 35mm image area. The image fills the 35mm frame and has no borders.

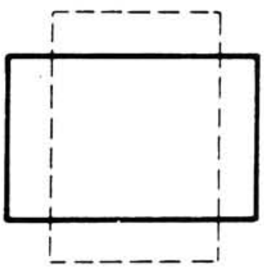


BORDERS Crop unwanted image area and fill any unused area within the frame. Borders should be used when the original is not to be cropped at all.

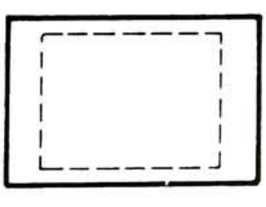


WITH CAPTION Caption will be included on slide.

WITHOUTCAPTION Caption will be masked with black or white paper.



SCREEN For normal classroom projection use, cropped horizontally or vertically, according to the orientation of the original.



T.V. When slide is to be used for television, the original must be photographed within the TV critical image area. The format must be horizontal.

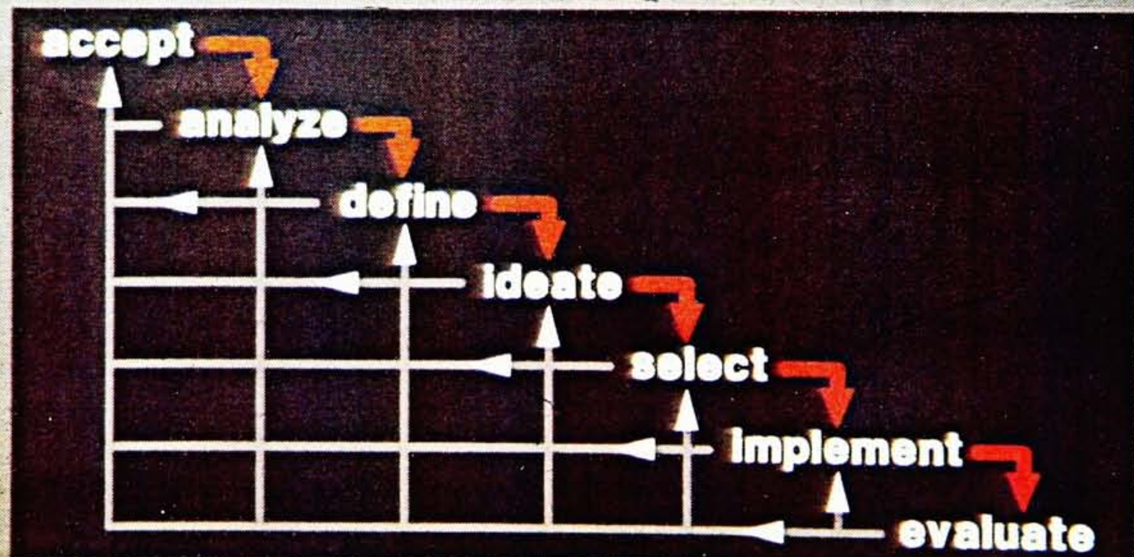
APPENDIX C

The design process flow chart illustrated the similarity in computer science and graphic design in their approach to problem solving. There is a feedback system of analyzing and checking.

PROCESS

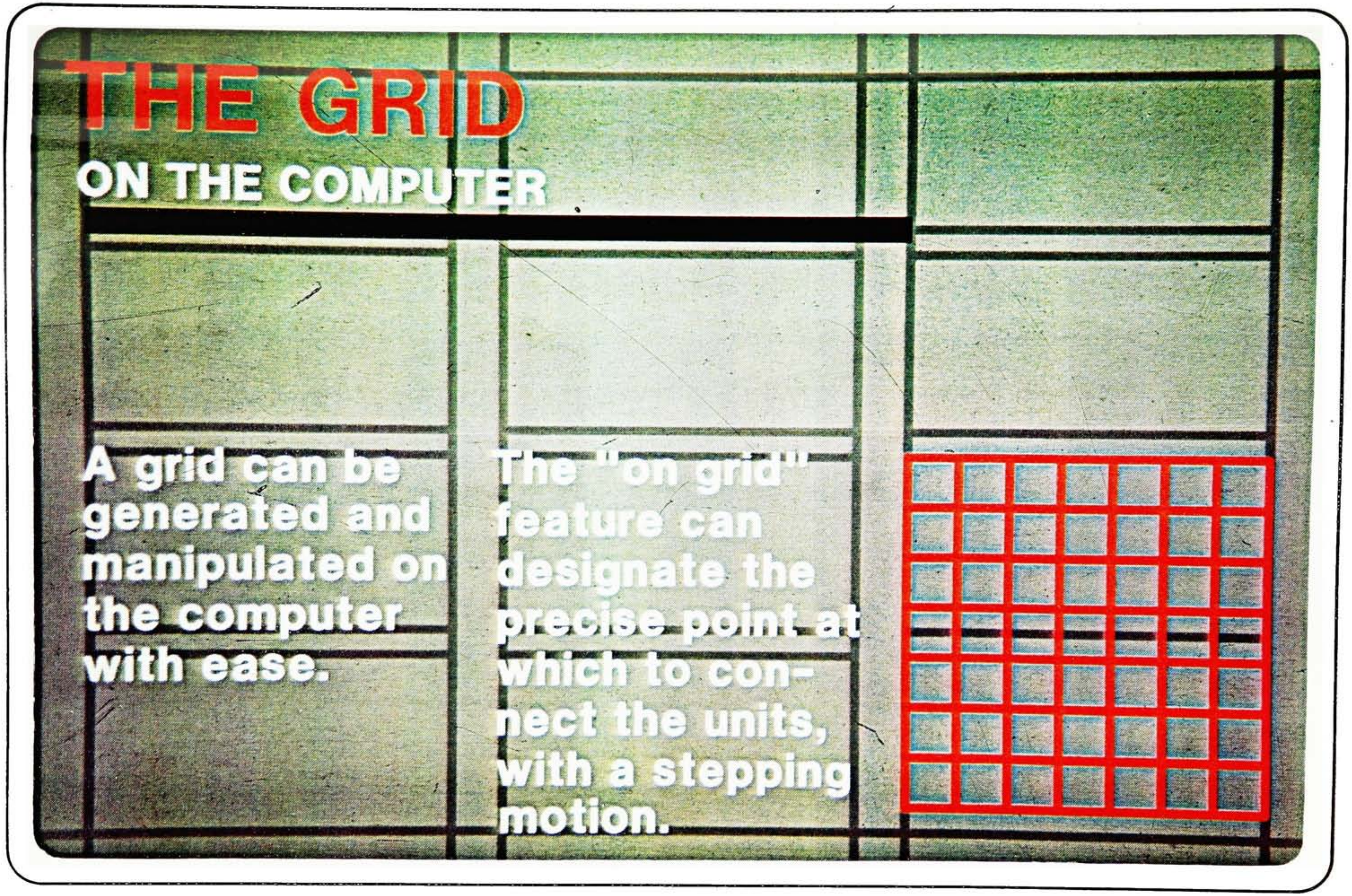
ON THE COMPUTER

Traditional design and computer have a similar problem solving process with a feedback system of analyzing and checking.



APPENDIX D

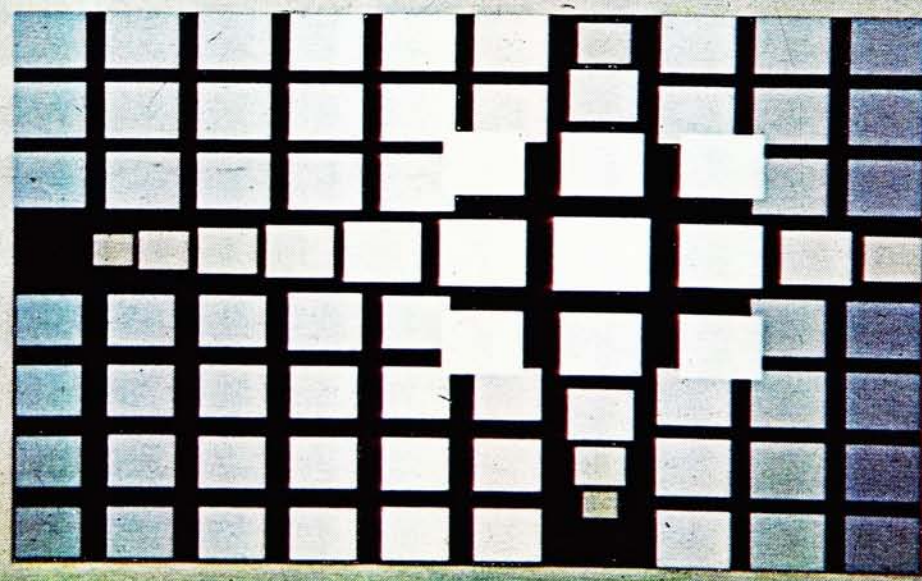
A grid format was used to design all of the title slides. This gave an overall unity to the presentaiton. Headlines, body copy, and illustrations were standardized. Size, color, and placement were chosen based upon this grid system.


THE GRID
ON THE COMPUTER
A grid can be generated and manipulated on the computer with ease.
The "on grid" feature can designate the precise point at which to con-nect the units, with a stepping motion.

DEVELOP CURRICULUM

ON THE COMPUTER

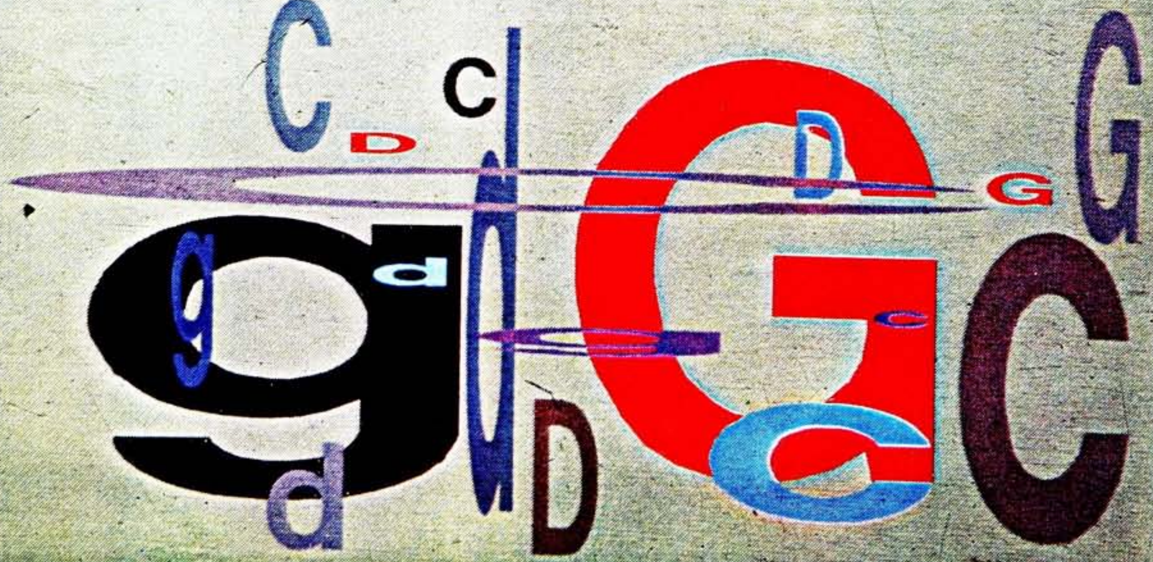
The computer is useful for exercises in space, form and color for experimental investigative, and educational reasons.

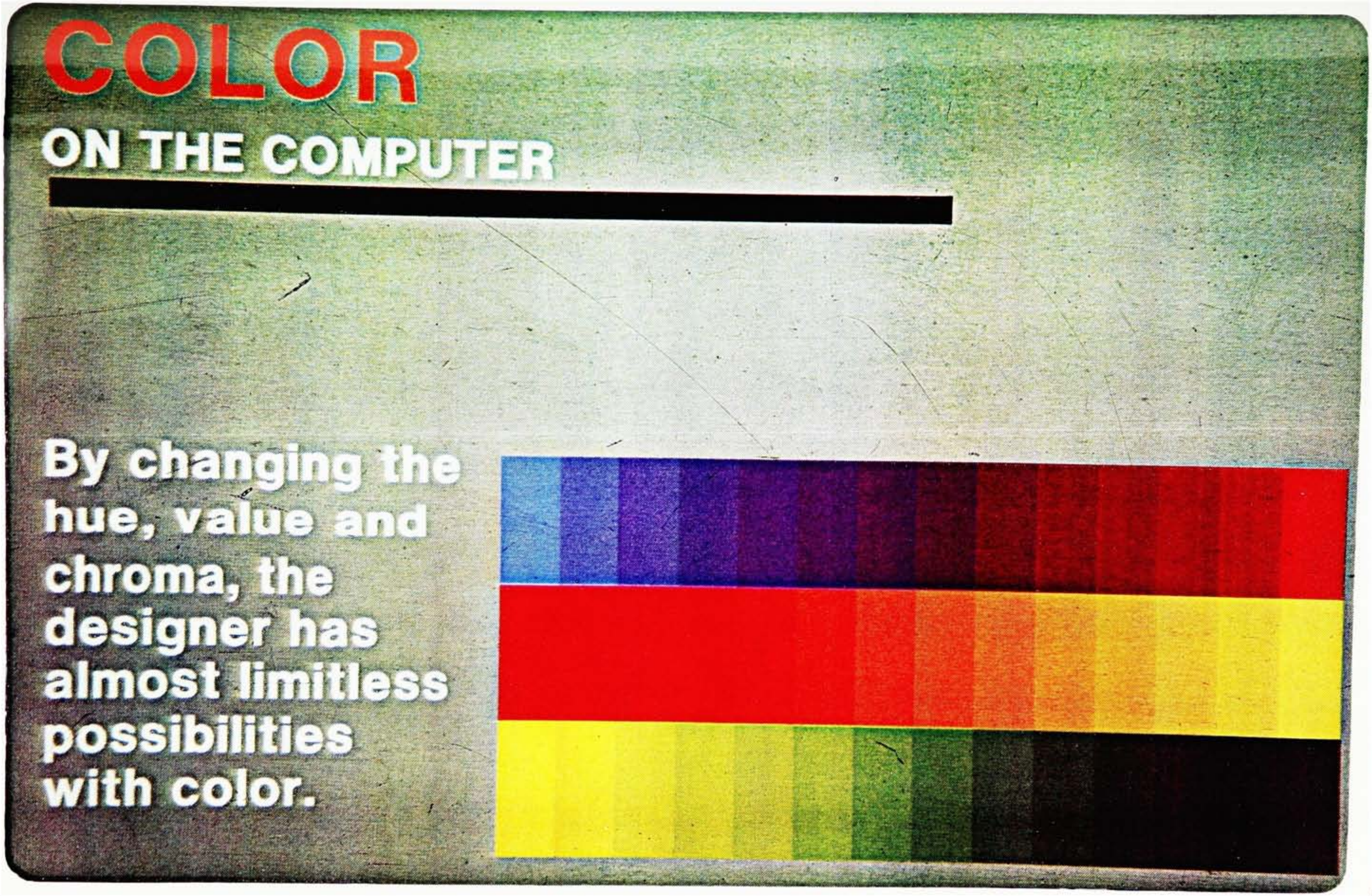


SERENDIPITY

ON THE COMPUTER

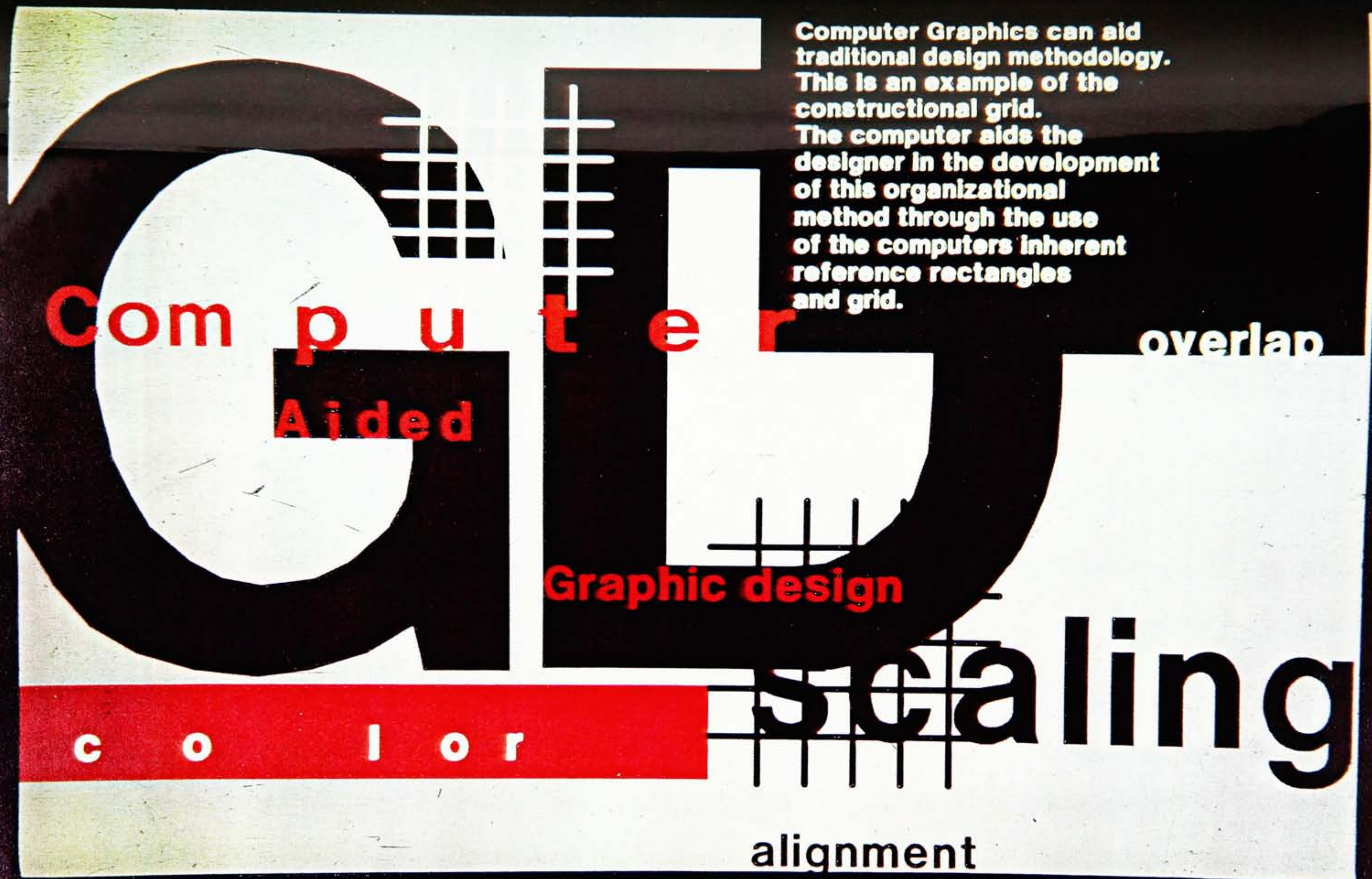
Happy accidents can be the beginning of new discovery. A controlled ran-domness leads to unimagined possibilities.

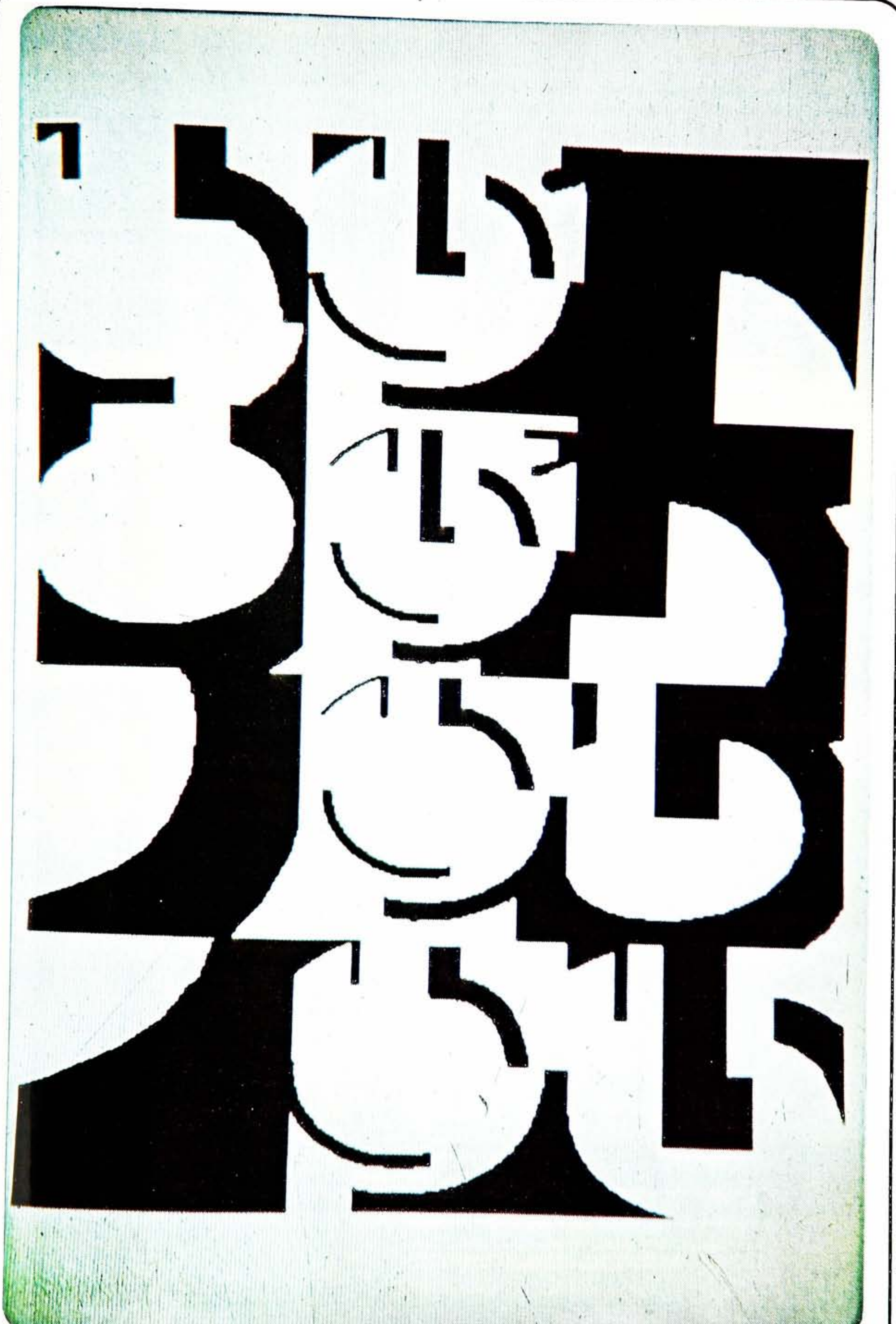


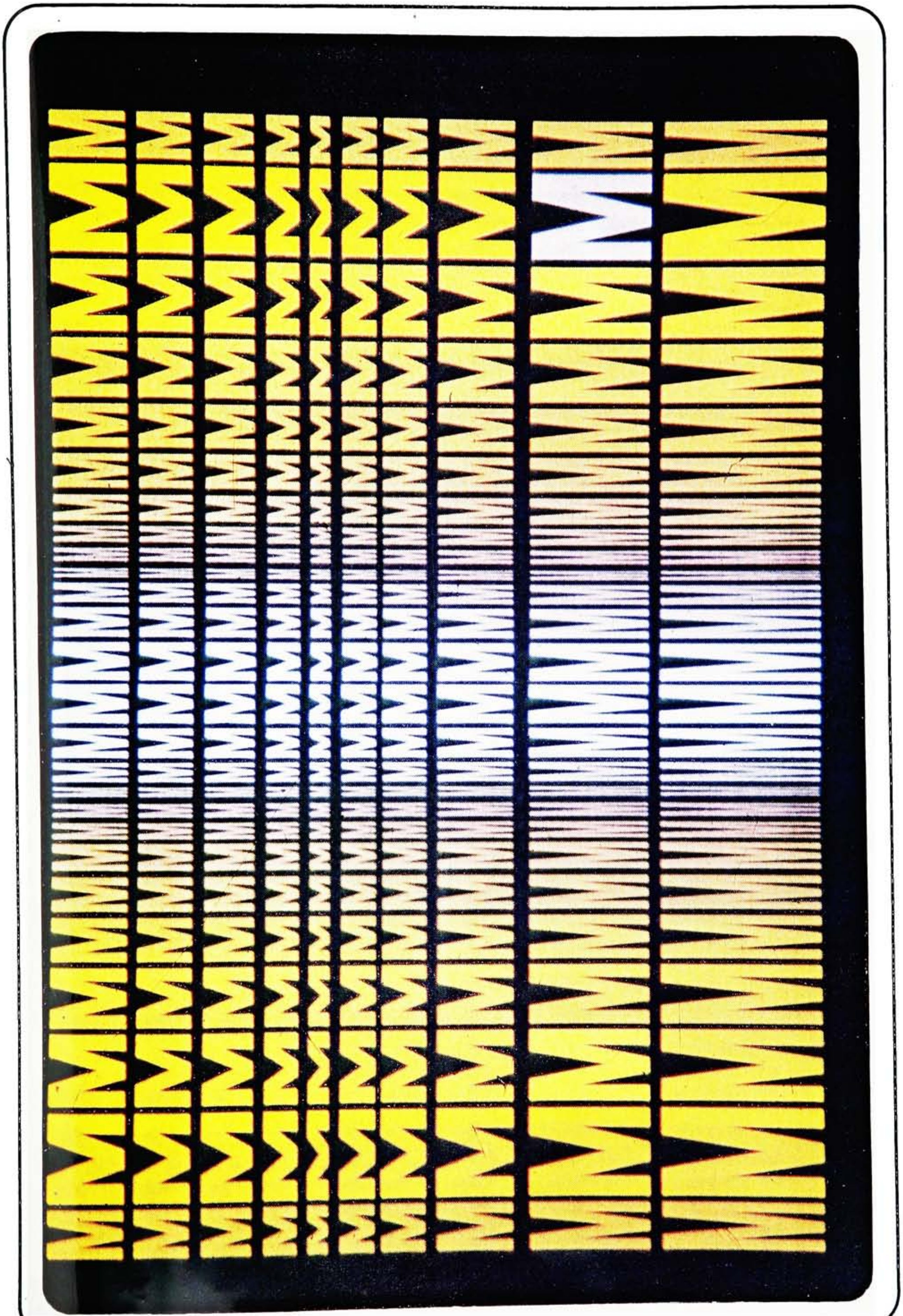

COLOR
ON THE COMPUTER
By changing the hue, value and chroma, the designer has almost limitless possibilities with color.

APPENDIX E

A common problem given to students in graphic design is one that relates to grids. A grid is an organizational tool for designers to use to their advantage. There are various types of grids. The following are examples of constructional, patternistic, and textural grid systems.

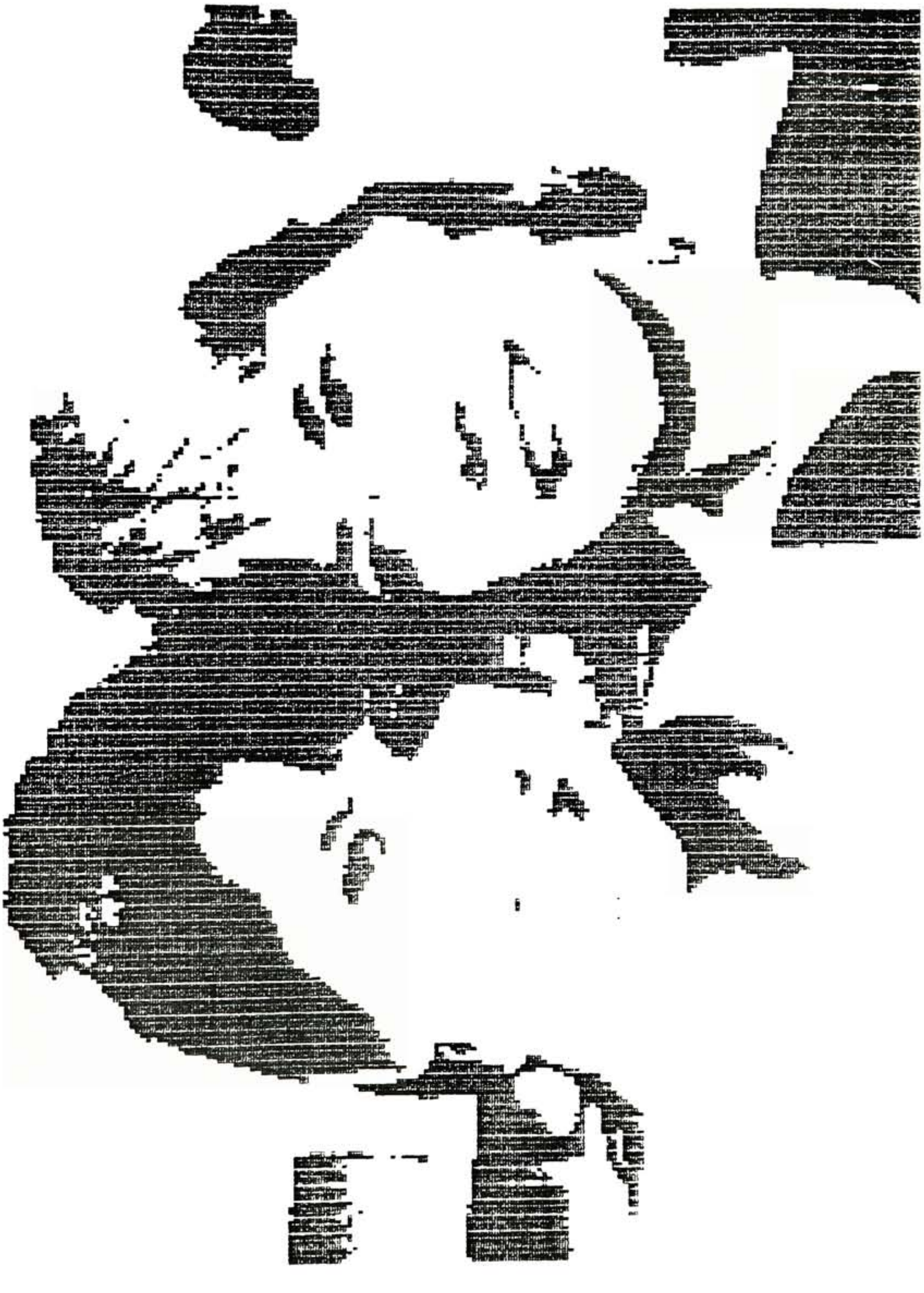

Computer Graphics can aid traditional design methodology. This is an example of the constructional grid. The computer aids the designer in the development of this organizational method through the use of the computers inherent reference rectangles and grid.
Com p u t e r
Aided
Graphic design
overlap
scaling
c o l o r
alignment

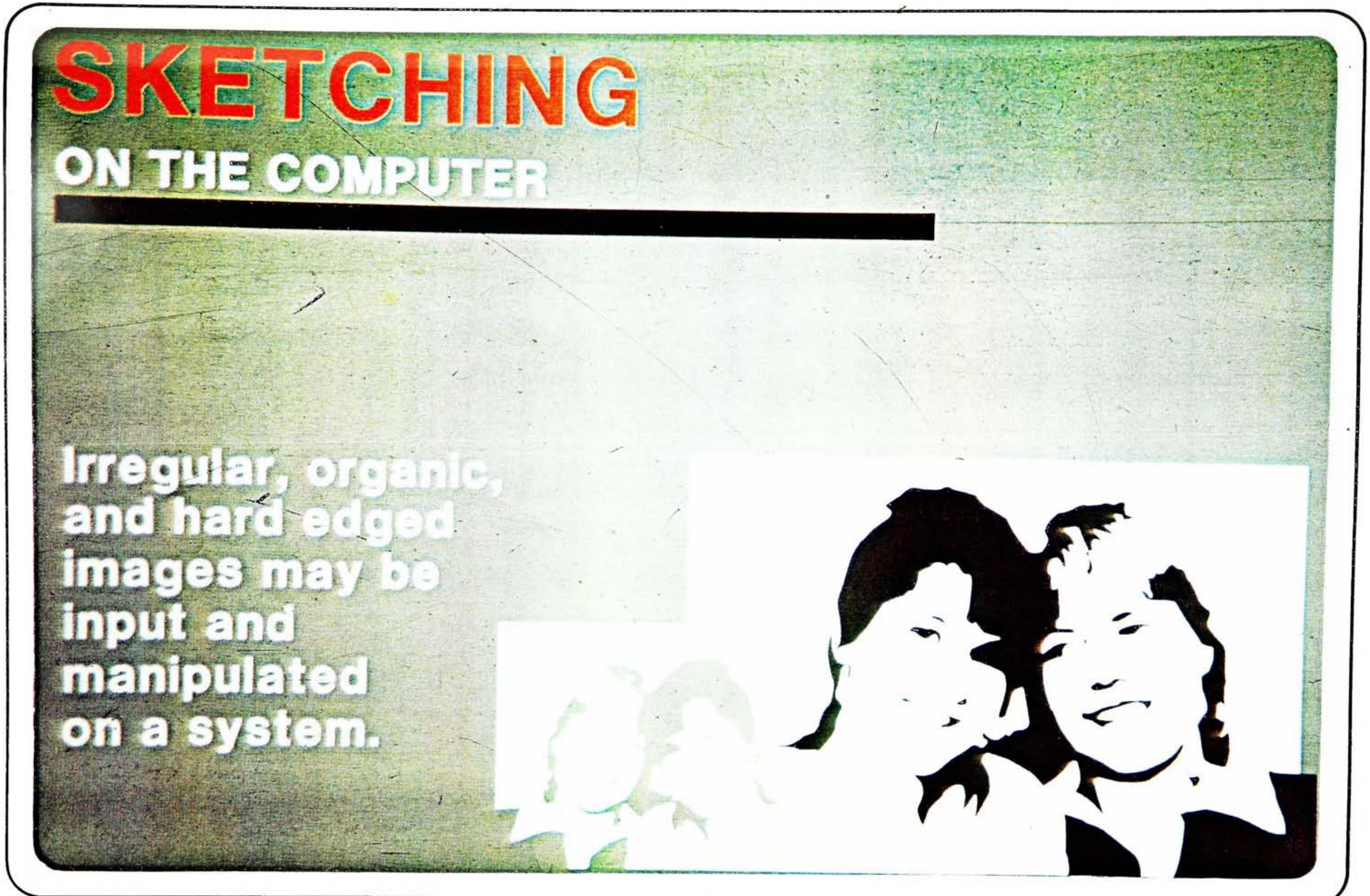




APPENDIX F

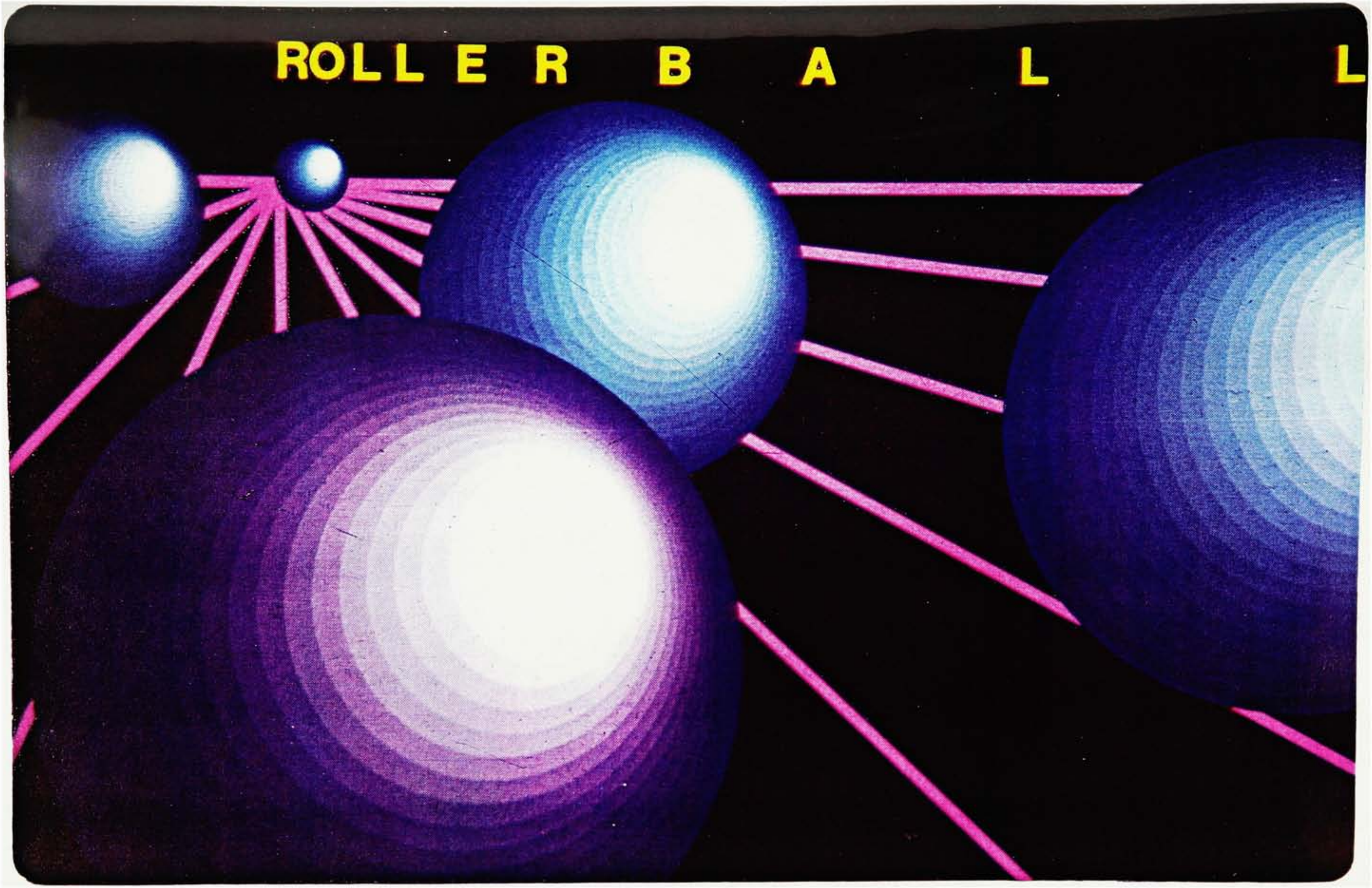
A video camera interfaced with the Apple IIe was used as input to digitize these faces into the computer. A printout was made. The hardcopy was used with a graphics tablet to input the image into the Genigraphics system where it was then manipulated.




SKETCHING
ON THE COMPUTER
Irregular, organic,
and hard edged
images may be
input and
manipulated
on a system.

APPENDIX G

Examples of computer graphic images generated on Genigraphics that were used in the video tape presentation.


ROLLERBALL

FRAME MV/GR CAPT JUST EDIT
MV VERT GR VERT
RESET +MV V/H GR V/H FRM OUT
MV HORZ GR HORZ


Clear
Record
Send
Reach out
and touch someone
far away.
AT&T

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